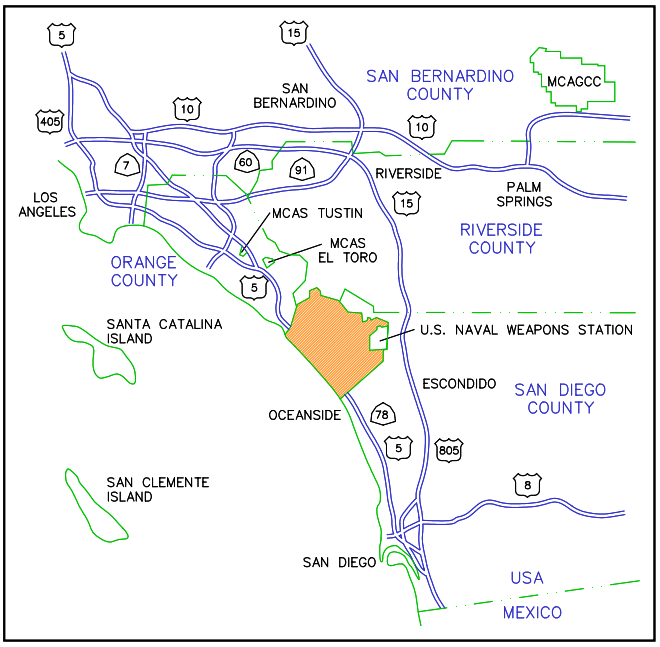
SITE CLOSURE REPORT
FOR FORMER UNDERGROUND STORAGE TANK SITE 21503
MARINE CORPS BASE CAMP PENDLETON
(Includes: Groundwater Monitoring Data Summary)



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June 2005

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ACRONYMS AND ABBREVIATIONS

AC/S ES	Assistant Chief of Staff Environmental Security
amsl	above mean sea level
bgs	below ground surface
btoc	below top of casing
DEH	(San Diego County) Department of Environmental Health
DO	dissolved oxygen
EB	equipment blank
FB	field blank
GC	gas chromatograph(y)
GC/MS	gas chromatography/mass spectrometry
ID	identification
IDW	investigation-derived waste
LCS	laboratory control sample(s)
LUFT	leaking underground fuel tank
MCB	Marine Corps Base
MS	matrix spike(s)
MSD	matrix spike duplicate(s)
MW	monitoring well
NA	not analyzed
ND	not detected
NFESC	Naval Facilities Engineering Service Center
NPWC	Navy Public Works Center
NS	not sampled
ORP	oxidation-reduction potential
QA	quality assurance
QA/QC	quality assurance/quality control
QC	quality control
QCER	quality control equipment rinsate
QCFB	quality control field blank
QCTB	quality control trip blank
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board, San Diego Region
SAM	Site Assessment and Mitigation
SWDIV	Southwest Division Naval Facilities Engineering Command
TB	trip blank

TMB	trimethylbenzene
TPH-G	total petroleum hydrocarbons quantified as gasoline
TPH-P	total petroleum hydrocarbons purgeable
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

Section 1.0: INTRODUCTION

This groundwater summary report was prepared by Battelle for Southwest Division Naval Facilities Engineering Command (SWDIV), the Naval Facilities Engineering Service Center (NFESC), and Marine Corps Base (MCB) Camp Pendleton under Contract No. N47408-01-D-8207, Task Order No. 0102. This task order requires Battelle to perform remediation of former underground storage tank (UST) sites in Areas 14, 15, and 21 located at MCB Camp Pendleton.

This report is intended to provide a summary of the continued groundwater sampling activities that have occurred at Site 21503 in response to a request from the Regional Water Quality Control Board (RWQCB, 2004) for additional groundwater monitoring at the site. The guidelines of the San Diego County Department of Environmental Health (DEH) *Site Assessment and Mitigation (SAM) Manual* (DEH, 2004) were followed for all groundwater monitoring activities conducted as part of this effort. Refer to Attachment 1 for a copy of the original comments (***reference code SMC:50-2832.05:peurp***) for Site 21503 which were provided by RWQCB to the Navy. Also included are the Navy's responses to the comments.

For a detailed description of the site assessment activities conducted at Site 21503 and all associated results, please refer to the *Final Site Assessment Report for Underground Storage Tank Site 21503, Marine Corps Base Camp Pendleton* (Battelle, 2003a). Procedures followed during all field activities conducted at Site 21503, as well as the sampling and analysis plan and health and safety plan prepared for this work, can be found in the *Final Work Plan for Characterization of Underground Storage Tank Sites in Areas 16 and 21 at Marine Corps Base Camp Pendleton* (Battelle, 2003b).

1.1 Objective of the Investigation

The objective of this task was to collect the data required to monitor groundwater quality at Site 21503. The objective was accomplished using the available site data and additional data collected using the procedures described within this report.

1.2 Site Identification Data

Site Address:	Site 21503, MCB Camp Pendleton
Facility Name:	Demolished Building
DEH Case No.:	H05939-118
RWQCB Release No.:	9UT2832
Property Owner:	U.S. Marine Corps
Tank Owner:	U.S. Marine Corps
Tank Operator:	U.S. Marine Corps
MCB Camp Pendleton Contact:	Mr. Chet Storrs, Assistant Chief of Staff Environmental Security (AC/S ES), Bldg. 22165 Camp Pendleton, CA 92055-5008 (760) 725-9774
Remedial Project Manager (RPM):	Mr. Bipin Patel, SWDIV, Code OPCE.BP 937 North Harbor Drive Camp Pendleton IPT, Bldg. 1, 3rd Floor San Diego, CA 92132-5190 (619) 532-4814
Responsible Party:	U.S. Marine Corps.

1.3 Site Description

Site 21503 consists of former Building 21503 and the region beneath and surrounding former UST 21503-2. The site is located within MCB Camp Pendleton Area 21 on Harbor Road, approximately 100 ft southeast of the Harbor Road and "C" Street intersection. Site 21503 was a Facility Maintenance Fuel Station, which contained six USTs, a pump island, and a pump vault. Based on samples taken during the UST removals and visual inspection of soils, it was determined that only UST 21503-2 had leaked (NPWC, 1997 and 1998). Figures 1 and 2 show the location of Area 21 within MCB Camp Pendleton and the location of Site 21503 within the 21 Area of the base, respectively. Prior to removal of UST 21503-2 on May 18, 1994, the site contained one (1) 12,000-gallon single-walled steel tank and associated product piping used to store gasoline.

1.3.1 Site Use and Structure Type. The building at Site 21503 has been demolished since the UST removal. This area is currently a vehicle maintenance asphalt parking area used for military vehicles and storage containers.

1.3.2 Topography. Site 21503 is located approximately 700 ft north of the Boat Basin, which is an artificial harbor connected to the Pacific Ocean. The site itself is relatively flat and is covered by asphalt pavement. A gradual slope exists to the south-southwest of the site and is graded towards the Boat Basin.

1.3.3 Regional Geology and Hydrogeology. A detailed description of regional geology and hydrogeology, as well as information from previous investigations conducted at Site 21503 can be found in the *Final Site Assessment Report for Underground Storage Tank Site 21503, Marine Corps Base Camp Pendleton* (Battelle, 2003a).

Section 2.0: SUMMARY OF INVESTIGATION

The primary objective for continued groundwater monitoring at Site 21503 is to evaluate trends in water quality over the long term, account for any temporal changes in water quality that occur due to seasonal effects (i.e., heavy rainfall), and ensure that groundwater contaminant migration is not occurring at the site. The following sections describe the activities performed to achieve the investigation objectives.

2.1 Groundwater Monitoring Well Sampling

On July 8, 2004; November 17, 2004; January 25, 2005; and April 19, 2005; groundwater monitoring wells 21503-MW01, 21503-MW02, 21503-MW03, and 21503-MW04 were sampled for total petroleum hydrocarbons-purgeable (TPH-P) and volatile organic compounds (VOCs). All groundwater samples collected were sent to a stationary laboratory for analysis. Refer to the *Final Work Plan for Characterization of Underground Storage Tank Sites in Areas 16 and 21 at Marine Corps Base Camp Pendleton* (Battelle, 2003b) for a description of groundwater purging, sampling, and handling procedures.

Prior to sampling, water from each well was purged using low-flow purging techniques with a bladder pump. Purging was considered complete when water quality parameter stabilization occurred. The following water quality parameters were measured and recorded: dissolved oxygen (DO), oxidation-reduction potential (ORP), conductivity, pH, temperature, turbidity, and salinity. Water-level measurements were taken from each well at the site prior to the start of purging. These data can be found on groundwater well development and purge logs, which are provided in Appendix A. Waste manifests for investigation-derived waste (IDW) generated during field activities are provided in Appendix B.

2.2 Sample Analyses

All groundwater samples collected at Site 21503 were analyzed for TPH-P and VOCs. Refer to the *Final Work Plan for Characterization of Underground Storage Tank Sites in Areas 16 and 21 at Marine Corps Base Camp Pendleton* (Battelle, 2003b) for a description of the analytical procedures used, as well as tables that summarize the individual VOC constituents (and their respective reporting limits) analyzed using United States Environmental Protection Agency (U.S. EPA) Method 8260b. A discussion of the sample analytical results is presented in Sections 3.2, 3.3, and 3.4. Laboratory analytical reports, chain-of-custody documentation, and laboratory quality assurance/quality control (QA/QC) data are provided in Appendix C.

QA/QC procedures in the field and the analytical laboratory are outlined in detail in the sampling and analysis plan contained in the *Final Work Plan for Characterization of Underground Storage Tank Sites in Areas 16 and 21 at Marine Corps Base Camp Pendleton* (Battelle, 2003b). During the field activities, equipment rinsate blanks were collected during the groundwater sampling effort to ensure that sampling equipment was properly decontaminated and that there was no cross contamination between samples. Equipment rinsates were analyzed for TPH-P. In addition, field blanks were collected during water sampling activities, and laboratory-supplied trip blanks were submitted with each cooler containing water samples to be analyzed for VOCs.

The laboratory QA/QC program consisted of laboratory control samples, laboratory duplicates, matrix spikes/matrix spike duplicates (MS/MSD), surrogate standards, internal standards, and method blanks. A complete description of the analytical QA/QC program is provided in the *Final Work Plan for Characterization of Underground Storage Tank Sites in Areas 16 and 21 at Marine Corps Base Camp Pendleton* (Battelle, 2003b).

Section 3.0: RESULTS OF INVESTIGATION

3.1 Water Level Measurements

Water-level data collected from the monitoring wells at Site 21503 during July 2004, November 2004, January 2005, and April 2005 were used to determine groundwater flow directions and hydraulic gradients. The data from wells 21503-MW01, 21503-MW02, 21503-MW03, and 21503-MW04 indicated water levels ranging from 10.30 to 13.83 and are provided in Table 1. Water level data collected from each sampling event were used in three-point calculations to determine the groundwater flow direction at the site. Groundwater flow was consistent during each monitoring period (approximately S60°E), with an average hydraulic gradient ranging from 0.027 to 0.081. The direction of groundwater flow at Site 21503 is consistent with that observed during the site assessment conducted during 2003. No free product has been observed at Site 21503.

Table 1. Groundwater- and Product-Level Measurements at Site 21503

Well ID	Date Measured	Top of Casing Elevation (ft amsl)	Total Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (ft amsl)	Product Level (ft btoc)	Product Elevation (ft amsl)
21503-MW01	09/04/03	19.63	18.00	12.79	6.84	-	-
	07/08/04			13.36	6.27	-	-
	11/17/04			12.71	6.92	-	-
	01/25/05			10.82	8.81	-	-
	04/19/05			11.15	8.48	-	-
21503-MW02	09/04/03	19.97	18.00	13.14	6.83	-	-
	07/08/04			13.50	6.47	-	-
	11/17/04			12.99	6.98	-	-
	01/25/05			11.25	8.72	-	-
	04/19/05			11.50	8.47	-	-
21503-MW03	09/04/03	19.66	18.00	13.53	6.13	-	-
	07/08/04			13.83	5.83	-	-
	11/17/04			13.68	5.98	-	-
	01/25/05			12.75	6.91	-	-
	04/19/05			12.35	7.31	-	-
21503-MW04	09/04/03	19.29	18.00	12.17	7.12	-	-
	07/08/04			12.55	6.74	-	-
	11/17/04			12.05	7.24	-	-
	01/25/05			10.30	8.99	-	-
	04/19/05			10.44	8.85	-	-

amsl = above mean sea level.
btoc = below top of casing.
ID = identification.

3.2 Groundwater Sample Results and Interpretation

Groundwater samples were collected at Site 21503 on July 8 and November 17, 2004 and January 25 and April 19, 2005 and sent to a stationary analytical laboratory for TPH-P and VOC analyses. Table 2 presents the results of these sample analyses. Based on the analytical results, TPH-P was detected in 21503-MW01 at a maximum concentration of 12 mg/L, which is lower than the concentration measured during site assessment activities. In addition, several VOCs were detected in 21503-MW01 with concentrations ranging from 5.5 µg/L (*o*-xylene) to 1,400 µg/L (ethylbenzene). No TPH-P or VOCs

were measured in groundwater monitoring wells 21503-MW02, 21503-MW03, and 21503-MW04. These data presented in Table 2, which cover a period >1.5 years, provide evidence that the groundwater plume at Site 21503 has been defined and is not migrating away from the former UST 21503-2 area. Figure 3 is a groundwater contaminant distribution map, and illustrates the water sample results in relation to the sampling locations at Site 21503.

3.3 Field Quality Assurance/Quality Control

QA/QC measures were taken in the field to ensure that meaningful and representative data sets were generated at Site 21503. The following subsections describe the QA/QC results from this task.

3.3.1 Equipment Rinsate Blanks. Equipment rinsate samples were collected at Site 21503 during each groundwater monitoring event and analyzed for TPH-P. No detectable contamination was measured in the equipment rinsate water from samples collected during July 2004, November 2004, January 2005, and April 2005, indicating that proper decontamination of sampling equipment occurred and sample analytical results are representative of actual aquifer conditions. Results of the equipment rinsate blank analyses are presented in Table 3.

3.3.2 Trip Blanks. Laboratory-provided trip blanks accompanied all sample coolers shipped to the stationary analytical laboratory that contained groundwater samples collected at Site 21503. Trip blanks help to provide evidence that contaminants detected in environmental samples are not indicative of contamination during sample transport. The trip blanks that accompanied groundwater samples collected from Site 21503 during July 2004, January 2005, and April 2005 were analyzed for VOCs. No VOCs were measured in any of these trip blank samples; therefore, hydrocarbon constituents measured in groundwater sample 21503-MW01 are not a result of sample contamination during transport. Results of trip blank analyses are presented in Table 3.

3.3.3 Field Blanks. Field blanks were collected at Site 21503 during groundwater sampling activities conducted from July 2004 through April 2005. Field blanks help to provide evidence that contaminants detected in environmental samples are not a result of cross contamination during sample acquisition activities. The field blanks associated with Site 21503 were analyzed for VOCs. Because no VOCs were measured in the field blank samples, it can be concluded that hydrocarbon constituents measured in groundwater samples from 21503-MW01 during each sampling event are not a result of sample contamination during collection. Results of field blank analyses are presented in Table 3.

3.4 Laboratory Quality Assurance/Quality Control

Analyses of soil and groundwater samples were performed by Alpha Analytical, Inc., a California-certified laboratory, according to the *Quality Assurance Plan for Alpha Analytical, Inc.* (Alpha Analytical, 2003). Laboratory quality control (QC) was performed as described in the *Test Methods for Evaluating Solid Waste*, 3rd edition (Alpha Analytical, 2003). QC charts were used to verify method precision and accuracy. Tabulated QC data were reviewed by the QC Officer and analysts. In addition, the QC procedures used during gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS) analyses were based primarily on those specified in U.S. EPA 8000 (Resource Conservation and Recovery Act) and the California LUFT Field Manual methods of analysis.

Table 2. Laboratory Analytical Results for Detected Compounds in Groundwater Samples Collected at Site 21503

Sample ID	Date Sampled	TPH-P (mg/L) Method 8015B	Lead (mg/L) Method SW6020	VOCs (µg/L) Method 8260B							
				Ethylbenzene	*m,p*-Xylene	*o*-Xylene	Isopropylbenzene	*n*-Propylbenzene	1,3,5-TMB	1,2,4-TMB	Naphthalene
21503-MW01*	09/04/03	**15**	**0.018**	**1,600**	**1,800**	**140**	**130**	**400**	**560**	**2,600**	**830**
	07/08/04	**3.5**	NS	**540**	**160**	**6.1**	**47**	**120**	**51**	**210**	**200**
	11/17/04	**8.1**	NS	**1,400**	**100**	<5.0**	**110**	**350**	**42**	**220**	**400**
	1/25/05	**12**	NS	**1,000**	**400**	**35**	**94**	**280**	**190**	**730**	**570**
	4/19/05	**4.1**	NS	**460**	**96**	**5.5**	**45**	**140**	**54**	**250**	**300**
21503-MW02	09/04/03	<0.10 O	<0.0050	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
	07/08/04	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0
	11/17/04	<0.20 O	NS	<1.0 O	<1.0 O	<1.0 O	<2.0 O	<2.0 O	<2.0 O	<2.0 O	<8.0 O
	1/25/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
	4/19/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
21503-MW03	09/04/03	<0.050	<0.0050	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<2.0
	07/08/04	<0.050	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<2.0
	11/17/04	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
	1/25/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
	4/19/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
21503-MW04	09/04/03	<0.050	<0.0050	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<2.0
	07/08/04	<0.20 O	NS	<1.0 O	<1.0 O	<1.0 O	<2.0 O	<2.0 O	<2.0 O	<2.0 O	<8.0 O
	11/17/04	<0.20 O	NS	<1.0 O	<1.0 O	<1.0 O	<2.0 O	<2.0 O	<2.0 O	<2.0 O	<8.0 O
	1/25/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O
	4/19/05	<0.10 O	NS	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<4.0 O

O = Reporting limits were increased due to sample foaming.
* = Duplicate sample collected; the highest value between the original and duplicate is presented in this table.
** = Reporting limits were increased due to high concentrations of target analyses.
NS = Not sampled.

Table 3. Analytical Results for Field QA/QC Samples Collected at Site 21503

Sample ID	Date Sampled	TPH-P (mg/L) Method 8015	VOCs (µg/L) Method 8260b
21503-QCER	09/04/03	<0.050	NA
21503-EB01	07/08/04	<0.050	NA
21503-EB01	11/17/04	<0.050	NA
21503-QCEB	01/25/05	<0.050	NA
21503-QCEB	04/19/05	<0.050	NA
21503-QCTB	09/04/03	NA	ND
21503-TB01	07/08/04	NA	ND
21503-QCTB	01/25/05	NA	ND
21503-QCTB	04/19/05	NA	ND
21503-QCFB	09/04/03	NA	ND
21503-FB01	07/08/04	NA	ND; 10*
21503-FB01	11/17/04	NA	ND
21503-QCFB	01/25/05	NA	ND
21503-QCFB	04/19/05	NA	ND

EB = equipment blank; QCER = quality control equipment rinsate.
FB = field blank; QCFB = quality control field blank.
TB = trip blank; QCTB = quality control trip blank.
ND = not detected; individual VOC constituents contain varying reporting limits.
NA = not analyzed
* = a dichloromethane concentration of 10 µg/L was detected in the field blank; however, this constituent was not observed in samples collected from groundwater monitoring wells.

Data were reviewed for conformance to generally accepted standards for data quality. The QC checks in the laboratory protocol are specific to the analytical method of interest and include laboratory control samples (LCS), MS/MSD, surrogate spikes (if applicable), and method blanks. In general, all laboratory QC criteria were met; any discrepancies discovered during the review process were evaluated in relation to their associated environmental and field quality assurance (QA) sample results. QC results are summarized in Appendix C. Holding times were met for all sample analyses.

3.4.1 Total Petroleum Hydrocarbons-Purgeable (U.S. EPA 8015 Modified/CA LUFT). All method blanks associated with the TPH-P samples were analyte-free. All LCS, MS, and MSD samples analyzed were within laboratory acceptance criteria. Due to matrix effects, the MSD for 21503-MW04, collected in April 2005, had a recovery outside the acceptance windows. Based on the evaluation, all environmental sample results are considered valid and usable.

3.4.2 Volatile Organic Compounds (U.S. EPA 8260b). All method blanks associated with the VOC samples were analyte-free. All LCS, MS, and MSD samples analyzed were within laboratory acceptance criteria. Based on the evaluation, all environmental sample results are considered valid and usable.

3.4.3 Laboratory Data Validation. A U.S. EPA Level III data validation was performed on 90% of the groundwater samples collected during January and April 2005. The remaining 10% of the samples underwent a Level IV data validation. The results indicated that the data generally met all analytical criteria. The individual laboratory data validation sheets for the samples are included in Appendix D.

Section 4.0: SUMMARY AND CONCLUSIONS

Comments from the RWQCB in regard to the *Final Assessment Report for Former UST 21503, Marine Corps Base Camp Pendleton* (***reference code SMC:50-2832.05:peurp***) were submitted on June 10, 2004. These comments were responded to by the Navy on June 30, 2004. In response to the RWQCB request for continued groundwater monitoring at Site 21503, quarterly groundwater monitoring was undertaken at the site to evaluate temporal trends in groundwater quality due to seasonal effects. Four additional quarters of groundwater monitoring were conducted at Site 21503, and this report summarizes the results.

Additional groundwater sampling events were completed at Site 21503 July 8, 2004, November 17, 2004, January 25, 2005, and April 19, 2005. Each groundwater monitoring well at the site (21503-MW01, 21503-MW02, 21503-MW03, and 21503-MW04) was sampled for TPH-P and VOCs per RWQCB request. Prior to sampling, the wells were purged using low-flow purging techniques. Groundwater analytical results indicated that TPH-P and several VOCs continued to persist in 21503-MW01, which is located within the former tank cavity. Maximum concentrations of TPH-P and VOCs measured during the groundwater sampling events conducted between July 2004 and April 2005 were as follows: TPH-P (12 mg/L), ethylbenzene (1,400 µg/L), *m*,*p*-xylene (400 µg/L), *o*-xylene (35 µg/L), isopropylbenzene (110 µg/L), *n*-propylbenzene (350 µg/L), 1,3,5-TMB (190 µg/L), 1,2,4-TMB (730 µg/L), and naphthalene (570 µg/L). In addition, low levels of *sec*-butylbenzene and *n*-butylbenzene were also observed. No free product has been detected at the site.

The groundwater sample data collected at Site 21503 are consistent with those collected during site assessment activities conducted in 2003 (Battelle, 2003a), and continue to demonstrate that the contaminant plume in the groundwater has been completely defined, and is limited to the region surrounding 21503-MW01 where low-level TPH and VOC constituents have been detected.

Based on the groundwater data that have been collected at former UST Site 21503 to date, the groundwater plume appears to be stable or shrinking. Perimeter groundwater monitoring wells installed at the site continually demonstrate a lack of petroleum constituents, which provides evidence that the plume is not migrating in the downgradient direction. Therefore, it is recommended that Site 21503 be considered for closure with no further action.

Section 5.0: REFERENCES

Alpha Analytical. 2003. *Quality Assurance Plan for Alpha Analytical, Inc. Revision 12.* Sparks, NV.

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NPWC, see Navy Public Works Center.

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RWQCB, see Regional Water Quality Control Board, San Diego Region.

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APPENDIX A

GROUNDWATER SAMPLING PURGE LOGS

JULY 2004

Battelle
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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-01	Date: 08 July 04	Project No.:	Page 1 of 1

Equipment:
- HORIBA U 10 ☒ — S/N: 101028
- HORIBA U22 ☐ — S/N:
- OAKTON ORP
- FID/PHOTO VAC ☒
- ORION 290A ☐
- INTERFACE PROBE ☒ B
- OVA 128 ☐
- HORIBA ORP ☐
- WATER LEVEL ☐

Personnel: Woolfe, Headington

EXPOSURE MONITORING
Background: 0.0 PPM
Reading: 0.1 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 13.36 — Depth to Product:

Water Column: — Product Layer:

Well Casing Diameter:

Borehole Diameter: — Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Pump Rate: 120 mL/min.

Purge Start Time: 1458 HRS

Purge Stop Time: 1515 HRS

Total volume Purged: 4L ~~Gal.~~

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1502	13.30	—	6.99	2.35	0	0.42	26.3	0.11	24.2	
1505	13.35	—	6.98	2.35	0	0.38	26.1	0.11	-8.2	
1508	13.40	—	6.98	2.35	0	0.47	26.1	0.11	-17.2	
1511	13.40	—	6.98	2.35	0	0.47	26.1	0.11	-22.0	
1514	13.40	—	6.98	2.35	0	0.47	26.2	0.11	-25.0	
										80% Recharge Level:
										Sample Collected: 1520 HRS

Field Team Leader Signature _____

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-02	Date: 8July04	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10 ☒ HORIBA U22 ☐ ☒ OAKTON ORP
S/N: 101028 S/N:
FID/PHOTO VAC ☒ 9 ORION 290A ☐
INTERFACE PROBE ☐ OVA 128 ☐
HORIBA ORP ☐ WATER LEVEL ☐

Personnel: Woolfe Headington

EXPOSURE MONITORING
Background: 0.0 PPM
Reading: 0.1 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 13.50' Depth to Product: Ø
Water Column: Product Layer: Ø
Well Casing Diameter: 2"
Borehole Diameter: Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☒
Pump Rate: ~~110/mL~~ 110 mL/min.
Purge Start Time: 1405 HRS
Purge Stop Time: 1428 HRS
Total volume Purged: 3L Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1409	13.58	—	7.06	3.03	4.19	0.47	27.8	0.12	86.1	
1412	13.58	—	7.05	2.55	194	0.26	27.6	0.12	16.2	
1415	13.58	—	7.05	2.52	51	0.26	27.6	0.12	11.1	
1418	13.58	—	7.05	2.50	2	0.26	27.6	0.12	11.1	
1421	13.58	—	7.06	2.49	0	0.26	27.5	0.12	11.2	
1424	13.58	—	7.06	2.49	0	0.26	27.6	0.12	11.1	
										80% Recharge Level:
										Sample Collected: 1428 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.: MW-03	Date: 08JUL04	Project No.: 6486044-31REG	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 901065		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒ 1	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Oakton ORP

Personnel: MIKE Woolfe
GREG HEADINGTON

EXPOSURE MONITORING		WELL CONDITION	
Background: NA	PPM	Good	☒
Reading:	PPM	Fair	☐
		Poor	☐

Total Well Depth:	18.00'		
Static Water Level:	13.83'	Depth to Product:	
Water Column:		Product Layer:	
Well Casing Diameter:			
Borehole Diameter:		Multiplier:	
Low Flow Method	☒		
Minimal Purge Sampling	☐		

Pump Type:	Peristaltic ☐		Submersible ☐
	Liquid Ring ☐		Bladder Pump ☒
Pump Rate:			
Purge Start Time: 1400	HRS		
Purge Stop Time: 1430	HRS		
Total volume Purged: 4.8 Liter	Gal.	plus 240cc collected	5.0 Liter ~~4.9 Liter~~ AH

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1406	13.91'	—	6.94	2.74	37	0.39	24.5	0.13	121.9	FLOW 120 cc/min turbid
1413	13.94'	—	6.80	2.50	25	0.27	24.1	0.12	126.7	
1417	13.95'	—	6.77	2.47	21	0.29	24.1	0.12	129.2	
1421	13.97'	—	6.76	2.45	20	0.24	24.1	0.11	130.8	
										80% Recharge Level:
										Sample Collected: 1430 HRS

Field Team Leader Signature [signature]

21503-FB01 - 1410 HRS
21503-EB01 - 1448 HRS

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-04	Date: 08 JUL 04	Project No.: G486044-31 REG	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 901065		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐ OAKton ORP
INTERFACE PROBE	☒ 1	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: mike Woolfe, Greg Headington

EXPOSURE MONITORING
Background: NA PPM
Reading: PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 12.55' Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 1456 HRS

Low Flow Method ☒

Purge Stop Time: 1515 HRS

Minimal Purge Sampling ☐

Total volume Purged: 41.4 Liter Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1500	12.65'	—	6.78	2.17	11	0.00	24.0	0.10	-123.5	
1503	12.68'	—	6.76	2.17	2	0.14	23.9	0.10	-134.6	
1506	12.82	—	6.74	2.15	2	0.20	23.9	0.10	-143.2	
										80% Recharge Level:
										Sample Collected: 1510 HRS

Field Team Leader Signature Greg Headington

NOVEMBER 2004

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-01	Date: 11-17-04	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: MG, TW, SL

EXPOSURE MONITORING
Background: / PPM
Reading: / PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 12.71 Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 11:04 HRS

Low Flow Method ☒

Purge Stop Time: 11:15 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3.5L Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
11:07	12.88		6.72	4.42	87.9	1.10	24.9	0.2	-153	STRONG HC ODR.
11:10	13.15		6.92	2.61	53.3	0.0	25.4	0.1	-161	
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-02	Date: 11-17-04	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: MG, TW, SL

EXPOSURE MONITORING
Background: ____ PPM
Reading: ____ PPM

WELL CONDITION
Good ☒ STANDING H_2O
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 12.99 Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 12:04 HRS

Low Flow Method ☒

Purge Stop Time: 12:19 HRS

Minimal Purge Sampling ☐

Total volume Purged: 5L Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
12:07	13.09		6.81	4.17	83.3	2.10	24.5	0.2	-136	
12:10	13.08		6.98	2.99	42.8	0.05	25.1	0.1	-150	
12:13	13.08		7.04	2.93	25.7	0.00	25.5	0.1	-154	
12:16	13.08		7.03	2.89	14.8	0.00	25.7	0.1	-155	
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-03	Date: 11-17-04	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: MG, TW, SL

EXPOSURE MONITORING
Background: / PPM
Reading: / PPM

WELL CONDITION
Good ☒ STANDING H_2O
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 13.68 Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 11:28 HRS

Low Flow Method ☒

Purge Stop Time: 11:52 HRS

Minimal Purge Sampling ☐

Total volume Purged: 7.5L Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
11:36	13.81		6.56	7.29	265	2.25	24.3	0.3	64	Collected F.B.
11:39	13.81		6.57	3.12	228	0.27	24.9	0.2	69	
11:42	13.80		6.56	3.03	163	0.00	25.2	0.2	80	
11:45	NA		6.55	3.02	126	0.00	25.3	0.2	85	
11:48	NA		6.52	3.01	60.6	0.00	25.4	0.1	93	
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

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MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-04	Date: 11/17/04	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: HG, TW, SL

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☑
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 12.05 Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☑

Well Casing Diameter:

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 10:48 HRS

Low Flow Method ☒

Purge Stop Time: 11:00 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3L Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
10:50	12.32		6.70	7.58	6.1	2.88	24.5	0.3	-134	
10:53	12.40		6.92	2.88	-7.4	0.35	24.9	0.1	-142	
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

January 2005

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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-01	Date: 25JAN05	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 901065		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒ 6	OVA 128	☒
+ ~~HORIBA~~ CARTON ORP 174908	☒	WATER LEVEL	☐

Personnel: M. Woolfe, G. Headington

EXPOSURE MONITORING		WELL CONDITION	
Background: 0.1	PPM	Good	☒
Reading: 0.1	PPM	Fair	☐
		Poor	☐

Total Well Depth: 18.00'			
Static Water Level: 10.82'	Depth to Product:	Pump Type: Peristaltic ☐	Submersible ☐
Water Column:	Product Layer:	Liquid Ring ☐	Bladder Pump ☒
Well Casing Diameter:		Pump Rate: 110 cc/min	
Borehole Diameter:	Multiplier:	Purge Start Time: 1026 HRS	
Low Flow Method ☒		Purge Stop Time: 1057 HRS	
Minimal Purge Sampling ☐		Total volume Purged: 2.9 Liter Gal. plus ~0.5 Liter = 3.4 Liters	
Criteria used to stop purging / development: Dry Well ☐		Parameter Stabilization ☒	

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1032	11.07'	—	6.66	2.55	0.0	0.35	22.2	0.12	-123.1	
1035	11.10'	—	6.65	2.57	0.0	0.17	22.2	0.12	-127.0	
1038	11.09'	—	6.65	2.57	0.0	0.37	22.0	0.12	-128.5	
										80% Recharge Level:
										Sample Collected: 1040 HRS

Field Team Leader Signature _____

21503-QCFB – 0920 HRS
21503-QCEB – 0925 HRS
21503-MW01D – 1040 HRS

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MCB Camp Pendleton

Well Development / Purge Log

240 mL

Location: 21503	Well No.:MW-02	Date: 25JAN05	Project No.: T057	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 101028		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒ S	OVA 128	☒
~~HORIBA~~ ORP 96588	☒	WATER LEVEL	☐

Personnel: WOOHE, G. HEADINGTON

EXPOSURE MONITORING
Background: 0.1 PPM
Reading: 0.1 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 11.25 Depth to Product: 0

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate: 100 cc/min FLOW = 252 cc/min

Borehole Diameter: Multiplier:

Purge Start Time: 0930 HRS

Low Flow Method ☒

Purge Stop Time: 0955 HRS

Minimal Purge Sampling ☐

Total volume Purged: 6.3 L ~~Gal.~~ INCLUDES SAMPLE VOL

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0932	11.25'	—	7.09	2.20	0	0.42	22.4	0.10	-36.9	
0936	11.25'	—	7.15	2.26	0	0.26	22.7	0.10	-58.9	
0940	11.26	—	7.16	2.28	0	0.19	23.0	0.10	-78.0	
0944	11.26	—	7.16	2.29	0	0.16	23.0	0.11	-87.2	
0948	11.26	—	7.16	2.30	0	0.12	23.3	0.11	-97.3	
										80% Recharge Level:
										Sample Collected: 0950 HRS

Field Team Leader Signature [signature]

Battelle
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MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-03	Date: 25 JAN 05	Project No.:	Page 1 of 1

Equipment:
- HORIBA U 10 ☑ — S/N: 901065 ~~28 CH~~
- HORIBA U22 ☐ — S/N:
- FID/PHOTO VAC ☐
- ORION 290A ☐
- INTERFACE PROBE ☑ 2
- OVA 128 ☑
- ~~HORIBA~~ OAKTON ORP 174908 ☑
- WATER LEVEL ☐

Personnel: M. Woolfe, G. Headington

EXPOSURE MONITORING
Background: 0.2 PPM
Reading: 0.2 PPM

WELL CONDITION
- Good ☐
- Fair ☒ NEEDS NEW LOCK
- Poor ☐

water in vault

Total Well Depth: 18.00'

Static Water Level: 12.75 — Depth to Product:

Water Column: — Product Layer:

Well Casing Diameter:

Borehole Diameter: — Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Liquid Ring ☐ Submersible ☐ Bladder Pump ☒

Pump Rate: 214 cc/min

Purge Start Time: 0941 HRS

Purge Stop Time: 1006 HRS

Total volume Purged: 5.1 Liter Gal. plus volume collected = 5.34 Liter

Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0944	12.83'		6.50	2.68	30	1.16	22.0	0.13	263	
0947	12.81'		6.60	2.67	28/5	0.29	—	0.13	247	
0951	12.81'		6.60	2.66	0.0	1.02	22.5	0.13	233	
0954	12.81'		6.60	2.66	0.0	0.92	22.7	0.13	229	
0957	12.81'		6.59	2.66	0.0	0.82	22.9	0.13	223	
										80% Recharge Level:
										Sample Collected: 1002 HRS

Field Team Leader Signature [signature]

Battelle
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MCB Camp Pendleton

Well Development / Purge Log

Location: 21503	Well No.:MW-04	Date: 25 JAN 05	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 101028		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒ 4	OVA 128	☒
~~HORIBA~~ ORP 96588	☐	WATER LEVEL	☐

Personnel: Woolfe, G Headington

EXPOSURE MONITORING
Background: 0.1 PPM
Reading: 0.2 PPM

WELL CONDITION
Good ☐
Fair ☒ WATER in VAULT
Poor ☐

Total Well Depth: 18.00'

Static Water Level: 10.30 | Depth to Product:

Water Column: | Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate: 100 cc/min

Borehole Diameter: | Multiplier:

Purge Start Time: 1025 HRS

Low Flow Method ☒

Purge Stop Time: — HRS

Minimal Purge Sampling ☐

Total volume Purged: 5.3 L ~~Gal~~ Includes Sample Vol

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1028	10.41	—	7.02	2.01	0	0.61	21.2	0.09	18.5	
1032	10.44	—	7.06	2.01	0	0.31	21.3	0.09	11.8	
1036	10.45	—	7.07	2.01	0	0.17	21.3	0.09	4.6	
1040	10.46	—	7.08	2.01	0	0.16	21.4	0.09	3.4	
										80% Recharge Level:
										Sample Collected: 1045 HRS

Field Team Leader Signature [signature]

April 2005

Battelle
. . . Putting Technology To Work

MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-01	Date: 19 APR 05	Project No.:	Page 1 of 1

Equipment:
- HORIBA U 10 [X] S/N: 101028
- FID/PHOTO VAC [ ]
- INTERFACE PROBE [X] 6
- HORIBA ORP [ ]
- HORIBA U22 [ ] S/N:
- ORION 290A [ ]
- OVA 128 [X]
- WATER LEVEL [ ]
- Oakton ORP [X] # 174908

Personnel: mike Woolfe, Greg Headington

EXPOSURE MONITORING		WELL CONDITION	
Background: 0.2	PPM	Good	[X]
Reading: 0.1	PPM	Fair	[ ]
		Poor	[ ]

Total Well Depth: 18.00' pump set @ 0725 HRS / 19APR

Static Water Level: 11.15'

Depth to Product:

Water Column:

Product Layer:

Pump Type: Peristaltic [ ] Liquid Ring [ ] Submersible [ ] Bladder Pump [X]

Well Casing Diameter:

Pump Rate: ~126 cc/min

Borehole Diameter:

Multiplier:

Purge Start Time: 1124 HRS

Low Flow Method [X]

Purge Stop Time: 1159 HRS

Minimal Purge Sampling [ ]

Total volume Purged: ~4 l plus Gal. 4.4 liter total

Criteria used to stop purging / development: Dry Well [ ] Parameter Stabilization [X]

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1129	11.32'	—	7.48	2.62	70	0.97	22.9	0.12	-117.0	
1133	11.30'	—	7.49	2.63	45	0.36	22.9	0.12	-129.2	500cc/min; adjust flow up
1137	11.31'	—	7.51	2.63	94	0.00	22.9	0.12	-134.7	
1141	11.42'	—	7.51	2.64	93	0.00	22.8	0.13	-141.3	Flow = 150cc/min, adjust down
1145	11.52'	—	7.52	2.64	86	0.00	22.8	0.13	-145.5	
										80% Recharge Level:
										Sample Collected: 1150 HRS

Field Team Leader Signature: Greg Headington

21503 - MW01D - 1150 HRS

Battelle
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MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-02	Date: 19 APR 05	Project No.:
Page 1 of 1			

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 901065		S/N:	OAKTON ORP 96588
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☒
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: MIKE Woolfe, Greg Headington

EXPOSURE MONITORING
Background: 0.1 PPM
Reading: 0.2 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00' Pump set @ 0741 HRS / 19 APR 05

Static Water Level: 11.50' Depth to Product:

Water Column: Product Layer:

Well Casing Diameter:

Borehole Diameter: Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Pump Rate: 200 cc/min.

Purge Start Time: 1123 HRS

Purge Stop Time: 1148 HRS

Total volume Purged: 5.2 L ~~Gal~~ Includes Sample Vol.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1127	11.57	—	7.25	2.09	6	0.00	22.7	0.10	-21.8	
1130	11.57	—	7.25	2.10	0	0.00	22.7	0.10	-37.7	
1133	11.57	—	7.25	2.10	0	0.00	22.7	0.10	-65.7	
1136	11.57	—	7.25	2.10	0	0.00	22.8	0.10	-86.8	
1139	11.57	—	7.25	2.11	0	0.00	22.8	0.10	-94.6	
1142	11.57	—	7.30	2.11	0	0.00	22.8	0.10	-96.7	
										80% Recharge Level:
										Sample Collected: 1144 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-03	Date: 19APR05	Project No.:	Page 1 of 1

Equipment:

- HORIBA U 10 ☒ — HORIBA U22 ☐
- S/N: 101028 — S/N:
- FID/PHOTO VAC ☐ — ORION 290A ☐ — OAKTON ORP ☒ * 174908
- INTERFACE PROBE ☒ 2 — OVA 128 ☒
- HORIBA ORP ☐ — WATER LEVEL ☐

Total Well Depth: 18.00' Pump set @0733 HRS / 19APR

Static Water Level: 12.35' — Depth to Product:

Water Column: — Product Layer:

Well Casing Diameter:

Borehole Diameter: — Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Criteria used to stop purging / development: Dry Well ☐

Personnel: Mike Woolfe, Greg Headington

EXPOSURE MONITORING
Background: 0.4 PPM
Reading: 0.5 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐
VACUUMED WATER OUT OF VAULT (MORRISON VAULT)

Pump Type: Peristaltic ☐ — Submersible ☐ — Liquid Ring ☐ — Bladder Pump ☒

Pump Rate: 168 ml/min

Purge Start Time: 1031 HRS

Purge Stop Time: 1056 HRS

Total volume Purged: 4 liters Gal plus 200 ~~600~~ cc = ~~4.6~~ 4.2 l
12H 24

Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
										Flow 200 cc/min.
GH ~~12~~ 1035	12.42'	—	7.30	1.90	8.0	0.18	22.1	0.09	236	
1039	12.42'	—	7.33	1.90	2.0	0.00	22.2	0.09	230	
1043	12.42'	—	7.33	1.89	0.0	0.00	22.3	0.09	222	
										80% Recharge Level:
										Sample Collected: 1045 HRS

Field Team Leader Signature Greg Headington

21503-QCTB-19APR05
21503-QCFB-1020 HRS
21503-QCFB-1111 HRS

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MCB Camp Pendleton
Well Development / Purge Log

Location: 21503	Well No.:MW-04	Date: 19 APR 05	Project No.:	Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐
S/N: 901065		S/N:	OAKTON ORP 96588
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☒
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: Mike Woolfe, Greg Headington

EXPOSURE MONITORING
Background: 0.2 PPM
Reading: 0.3 PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 18.00' Pump set @ 0745 / APR 05

Static Water Level: 10.44 Depth to Product:

Water Column: Product Layer:

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter:

Pump Rate: 200 cc/min, increased to 120 cc/min.

Borehole Diameter: Multiplier:

Purge Start Time: 1022 HRS

Low Flow Method ☒

Purge Stop Time: 1056 HRS

Minimal Purge Sampling ☐

Total volume Purged: 5.2 L ~~Gal.~~ Includes Sample vol.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1025	10.58'	—	6.86	1.80	0	0.45	20.7	0.09	209	
1029	10.58'	—	7.12	2.07	0	0.00	20.8	0.09	196.5	
1033	10.58'	—	7.19	2.06	0	0.00	20.8	0.09	165.7	
1037	10.58'	—	7.21	2.06	0	0.00	20.9	0.09	136.1	
1041	10.60	—	7.23	2.06	0	0.00	20.9	0.09	57.2	
1045	10.60	—	7.23	2.06	0	0.00	21.0	0.09	48.9	
1049	10.60	—	7.23	2.06	0	0.00	21.1	0.09	44.2	80% Recharge Level:
										Sample Collected: 1051 HRS

Field Team Leader Signature Greg Headington

APPENDIX B

WASTE MANIFESTS

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: C A 2 1 7 0 0 2 3 5 3 3
Manifest Document No.: 2 3 4 7 0
2. Page 1 of 1

3. Generator's Name and Mailing Address: USMC AC/S ENVIRO SEC.
PO BOX 555008
ER#760-725-5617 CAMP PENDLETON, CA 92055

4. Generator's Phone (760 725-4375 CONTACT: TRACY SAHAGUN

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC.
6. US EPA ID Number: C A R 0 0 0 0 1 1 2 0 5
A. Transporter's Phone: 619-722-6781

7. Transporter 2 Company Name:
8. US EPA ID Number:
B. Transporter's Phone:

9. Designated Facility Name and Site Address: DOME ROCK INDUSTRIES, INC.
3215 W. DOME ROCK ROAD
QUARTZSITE, AZ 85346
10. US EPA ID Number: A Z R 0 0 0 0 3 5 9 1 5
C. Facility's Phone: 928-927-7688

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE LIQUID	0 0 1	T T	0 0 5 0	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A. ACCEPTANCE#3533PW139 (PURGE WATER)
SITE: 21503,1523,1536,1575

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
24 HR. EMERGENCY NUMBER 1-800-244-1202/619-722-6781 *EFR*

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
x GERALD O. TUCKER	[signature]	07	16	04

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
RANDY JARRETT	[signature]	07	16	04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

Discrepancy Indication Space

Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Typed Name	Signature	Month	Day	Year

GENERATOR

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CA2170023533 | Manifest Document No. 04421 | 2. Page 1 of 1

3. Generator's Name and Mailing Address USMC AC/S ENVIRO. SEC.
4321 PO Box 555008
EM/760-725-5617 CAMP PENDLETON, CA 92055

4. Generator's Phone (760 725-4575 CONTACT: TRACY SAHAGUN

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC. | 6. US EPA ID Number: CAR000011205 | A. Transporter's Phone: 619-722-6781

7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone

9. Designated Facility Name and Site Address: DOME ROCK INDUSTRIES, INC.
3215 W. DOME ROCK ROAD
QUARTZSITE, AZ 85346
10. US EPA ID Number: AZR000035915 | C. Facility's Phone: 928-927-7688

11. Waste Shipping Name and Description | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt./Vol.

NON-HAZARDOUS WASTE LIQUID

01 DT 0008

15. Special Handling Instructions for Materials Listed Above
UA ACCEPTANCE#3533PM139 (PURGE WATER)
DT: 1505,1523,1536,1575

E. Handling Codes for Wastes Listed Above

16. Special Instructions and Additional Information
WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
EMERGENCY NUMBER: 1-800-244-1202/619-722-6781 EFR

17. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month Day Year
Margo Williams	Margo Williams	12/02/04

18. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
JOHN JARRETT	[illegible]	12/02/04

19. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year

ORIGINAL - RETURN TO GENERATOR

[redacted]

NON-HAZARDOUS WASTE MANIFEST

1. Generator US EPA ID No.

Manifest Document No. 2473.6

2. Page 1 of 1

3. Generator's Name and Mailing Address USMC AC/S ENVIRO. SEC.
PO BOX 555008
CAMP PENDLETON, CA 92055

4. Generator's Phone (ER#760-725-4321) 760-725-4375 CONTACT: TRACY SAHAGUN

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC.

6. US EPA ID Number: CAR000011205

A. Transporter's Phone: 619-722-6781

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address
DOME ROCK INDUSTRIES, INC.
3125 W. DOME ROCK RD.
QUARTZSITE, AZ 85346

10. US EPA ID Number: AZR000035915

C. Facility's Phone: 928 927-7688

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE LIQUID	001	TT	0007.0	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A. ACCEPTANCE#3533PW139 (PURGE WATER)
SITE No's-1523, 1536, 1575, 21503, 2264, 2653, MCAS

E. Handling Codes for Wastes Listed Above
11a. 01

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
24 HR. EMERGENCY NUMBER 1-800-244-1202/619-722-6781 *EFR*

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: Nathaniel D. Dorth | Signature | Month Day Year: 02/04/05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: RANDY JARRETT | Signature | Month Day Year: 02/04/05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: JERRY R. JARRETT | Signature | Month Day Year: 02/04/05

[redacted]

APPENDIX C:

LABORATORY ANALYTICAL REPORTS, CHAIN-OF-CUSTODY DOCUMENTATION, AND LABORATORY QUALITY ASSURANCE/QUALITY CONTROL DATA

JULY 2004

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *27-Jul-04*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-7358

CASE NARRATIVE

Project: TO44

Work Order: BMI04071244 **Cooler Temp:** 3 °C

Alpha's Sample ID	Client's Sample ID	Matrix
04071244-01A	21503-TB01	Aqueous
04071244-02A	21503-FB01	Aqueous
04071244-03A	21503-EB01	Aqueous
04071244-04A	21503-MW01	Aqueous
04071244-05A	21503-MW02	Aqueous
04071244-06A	21503-MW03	Aqueous
04071244-07A	21503-MW04	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received 07/10/04

Job#: TO44

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**21503-EB01**						
Lab ID :	BMI04071244-03A	TPH Purgeable	ND		0.050 mg/L	07/08/04	07/14/04
		Surr: 1,2-Dichloroethane-d4	100		%REC	07/08/04	07/14/04
		Surr: Toluene-d8	101		%REC	07/08/04	07/14/04
		Surr: 4-Bromofluorobenzene	103		%REC	07/08/04	07/14/04
Client ID :	**21503-MW01**						
Lab ID :	BMI04071244-04A	TPH Purgeable	3.5		0.50 mg/L	07/08/04	07/14/04
		Surr: 1,2-Dichloroethane-d4	95		%REC	07/08/04	07/14/04
		Surr: Toluene-d8	97		%REC	07/08/04	07/14/04
		Surr: 4-Bromofluorobenzene	99		%REC	07/08/04	07/14/04
Client ID :	**21503-MW02**						
Lab ID :	BMI04071244-05A	TPH Purgeable	ND	O	0.10 mg/L	07/08/04	07/14/04
		Surr: 1,2-Dichloroethane-d4	96		%REC	07/08/04	07/14/04
		Surr: Toluene-d8	97		%REC	07/08/04	07/14/04
		Surr: 4-Bromofluorobenzene	103		%REC	07/08/04	07/14/04
Client ID :	**21503-MW03**						
Lab ID :	BMI04071244-06A	TPH Purgeable	ND		0.050 mg/L	07/08/04	07/14/04
		Surr: 1,2-Dichloroethane-d4	97		%REC	07/08/04	07/14/04
		Surr: Toluene-d8	98		%REC	07/08/04	07/14/04
		Surr: 4-Bromofluorobenzene	102		%REC	07/08/04	07/14/04
Client ID :	**21503-MW04**						
Lab ID :	BMI04071244-07A	TPH Purgeable	ND	O	0.20 mg/L	07/08/04	07/14/04
		Surr: 1,2-Dichloroethane-d4	96		%REC	07/08/04	07/14/04
		Surr: Toluene-d8	98		%REC	07/08/04	07/14/04
		Surr: 4-Bromofluorobenzene	102		%REC	07/08/04	07/14/04

O = Reporting Limits were increased due to sample foaming.
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

7/23/04
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-04A
Client I.D. Number: 21503-MW01

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	5.0	µg/L
2	Chloromethane	ND	20	µg/L
3	Vinyl chloride	ND	5.0	µg/L
4	Chloroethane	ND	5.0	µg/L
5	Bromomethane	ND	20	µg/L
6	Trichlorofluoromethane	ND	5.0	µg/L
7	1,1-Dichloroethene	ND	5.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	50	µg/L
9	Dichloromethane	ND	20	µg/L
10	trans-1,2-Dichloroethene	ND	5.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	2.5	µg/L
12	1,1-Dichloroethane	ND	5.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	5.0	µg/L
14	cis-1,2-Dichloroethene	ND	5.0	µg/L
15	Bromochloromethane	ND	5.0	µg/L
16	Chloroform	ND	5.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	5.0	µg/L
18	2,2-Dichloropropane	ND	5.0	µg/L
19	1,2-Dichloroethane	ND	5.0	µg/L
20	1,1,1-Trichloroethane	ND	5.0	µg/L
21	1,1-Dichloropropene	ND	5.0	µg/L
22	Carbon tetrachloride	ND	5.0	µg/L
23	Benzene	ND	2.5	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	5.0	µg/L
25	Dibromomethane	ND	5.0	µg/L
26	1,2-Dichloropropane	ND	5.0	µg/L
27	Trichloroethene	ND	5.0	µg/L
28	Bromodichloromethane	ND	5.0	µg/L
29	cis-1,3-Dichloropropene	ND	5.0	µg/L
30	trans-1,3-Dichloropropene	ND	5.0	µg/L
31	1,1,2-Trichloroethane	ND	5.0	µg/L
32	Toluene	ND	2.5	µg/L
33	1,3-Dichloropropane	ND	5.0	µg/L
34	Dibromochloromethane	ND	5.0	µg/L
35	1,2-Dibromoethane (EDB)	ND	20	µg/L
36	Tetrachloroethene	ND	5.0	µg/L
37	1,1,1,2-Tetrachloroethane	ND	5.0	µg/L
38	Chlorobenzene	ND	5.0	µg/L
39	Ethylbenzene	540	2.5	µg/L
40	m,p-Xylene	160	2.5	µg/L
41	Bromoform	ND	5.0	µg/L
42	Styrene	ND	5.0	µg/L
43	o-Xylene	6.1	2.5	µg/L
44	1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
45	1,2,3-Trichloropropane	ND	20	µg/L
46	Isopropylbenzene	47	5.0	µg/L
47	Bromobenzene	ND	5.0	µg/L
48	n-Propylbenzene	120	5.0	µg/L
49	4-Chlorotoluene	ND	5.0	µg/L
50	2-Chlorotoluene	ND	5.0	µg/L
51	1,3,5-Trimethylbenzene	51	5.0	µg/L
52	tert-Butylbenzene	ND	5.0	µg/L
53	1,2,4-Trimethylbenzene	210	5.0	µg/L
54	sec-Butylbenzene	11	5.0	µg/L
55	1,3-Dichlorobenzene	ND	5.0	µg/L
56	1,4-Dichlorobenzene	ND	5.0	µg/L
57	4-Isopropyltoluene	ND	5.0	µg/L
58	1,2-Dichlorobenzene	ND	5.0	µg/L
59	n-Butylbenzene	11	5.0	µg/L
60	1,2-Dibromo-3-chloropropane (DBCP)	ND	30	µg/L
61	1,2,4-Trichlorobenzene	ND	20	µg/L
62	Naphthalene	200	20	µg/L
63	Hexachlorobutadiene	ND	20	µg/L
64	1,2,3-Trichlorobenzene	ND	20	µg/L
65	Surr: 1,2-Dichloroethane-d4	95		%REC
66	Surr: Toluene-d8	97		%REC
67	Surr: 4-Bromofluorobenzene	99		%REC

Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

7/22/04
Report Date

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-05A
Client I.D. Number: 21503-MW02

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	Tetrachloroethene	ND	1.0	µg/L
2	Chloromethane	ND	4.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Chlorobenzene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	Ethylbenzene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	m,p-Xylene	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	Bromoform	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Styrene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L	43	o-Xylene	ND	0.50	µg/L
9	Dichloromethane	ND	4.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L	45	1,2,3-Trichloropropane	ND	4.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Isopropylbenzene	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L	47	Bromobenzene	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L	48	n-Propylbenzene	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L	49	4-Chlorotoluene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L	50	2-Chlorotoluene	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L	51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L	52	tert-Butylbenzene	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L	53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L	54	sec-Butylbenzene	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L	55	1,3-Dichlorobenzene	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L	56	1,4-Dichlorobenzene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L	57	4-Isopropyltoluene	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L	58	1,2-Dichlorobenzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L	59	n-Butylbenzene	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L	61	1,2,4-Trichlorobenzene	ND	4.0	µg/L
27	Trichloroethene	ND	1.0	µg/L	62	Naphthalene	ND	4.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L	63	Hexachlorobutadiene	ND	4.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L	64	1,2,3-Trichlorobenzene	ND	4.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	96		%REC
31	1,1,2-Trichloroethane	ND	1.0	µg/L	66	Surr: Toluene-d8	97		%REC
32	Toluene	ND	0.50	µg/L	67	Surr: 4-Bromofluorobenzene	103		%REC
33	1,3-Dichloropropane	ND	1.0	µg/L					
34	Dibromochloromethane	ND	1.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

7/23/04
Report Date

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-06A
Client I.D. Number: 21503-MW03

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L
9	Dichloromethane	ND	2.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L
27	Trichloroethene	ND	1.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L
31	1,1,2-Trichloroethane	ND	1.0	µg/L
32	Toluene	ND	0.50	µg/L
33	1,3-Dichloropropane	ND	1.0	µg/L
34	Dibromochloromethane	ND	1.0	µg/L
35	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
36	Tetrachloroethene	ND	1.0	µg/L
37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
38	Chlorobenzene	ND	1.0	µg/L
39	Ethylbenzene	ND	0.50	µg/L
40	m,p-Xylene	ND	0.50	µg/L
41	Bromoform	ND	1.0	µg/L
42	Styrene	ND	1.0	µg/L
43	o-Xylene	ND	0.50	µg/L
44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
45	1,2,3-Trichloropropane	ND	2.0	µg/L
46	Isopropylbenzene	ND	1.0	µg/L
47	Bromobenzene	ND	1.0	µg/L
48	n-Propylbenzene	ND	1.0	µg/L
49	4-Chlorotoluene	ND	1.0	µg/L
50	2-Chlorotoluene	ND	1.0	µg/L
51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
52	tert-Butylbenzene	ND	1.0	µg/L
53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
54	sec-Butylbenzene	ND	1.0	µg/L
55	1,3-Dichlorobenzene	ND	1.0	µg/L
56	1,4-Dichlorobenzene	ND	1.0	µg/L
57	4-Isopropyltoluene	ND	1.0	µg/L
58	1,2-Dichlorobenzene	ND	1.0	µg/L
59	n-Butylbenzene	ND	1.0	µg/L
60	1,2-Dibromo-3-chloropropane (DBCP)	ND	3.0	µg/L
61	1,2,4-Trichlorobenzene	ND	2.0	µg/L
62	Naphthalene	ND	2.0	µg/L
63	Hexachlorobutadiene	ND	2.0	µg/L
64	1,2,3-Trichlorobenzene	ND	2.0	µg/L
65	Surr: 1,2-Dichloroethane-d4	97		%REC
66	Surr: Toluene-d8	98		%REC
67	Surr: 4-Bromofluorobenzene	102		%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

7/23/04
Report Date

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-07A
Client I.D. Number: 21503-MW04

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L
2	Chloromethane	ND	8.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L
5	Bromomethane	ND	8.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	20	µg/L
9	Dichloromethane	ND	8.0	µg/L
10	trans-1,2-Dichloroethene	ND	2.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	2.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	2.0	µg/L
14	cis-1,2-Dichloroethene	ND	2.0	µg/L
15	Bromochloromethane	ND	2.0	µg/L
16	Chloroform	ND	2.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	2.0	µg/L
18	2,2-Dichloropropane	ND	2.0	µg/L
19	1,2-Dichloroethane	ND	2.0	µg/L
20	1,1,1-Trichloroethane	ND	2.0	µg/L
21	1,1-Dichloropropene	ND	2.0	µg/L
22	Carbon tetrachloride	ND	2.0	µg/L
23	Benzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	2.0	µg/L
25	Dibromomethane	ND	2.0	µg/L
26	1,2-Dichloropropane	ND	2.0	µg/L
27	Trichloroethene	ND	2.0	µg/L
28	Bromodichloromethane	ND	2.0	µg/L
29	cis-1,3-Dichloropropene	ND	2.0	µg/L
30	trans-1,3-Dichloropropene	ND	2.0	µg/L
31	1,1,2-Trichloroethane	ND	2.0	µg/L
32	Toluene	ND	1.0	µg/L
33	1,3-Dichloropropane	ND	2.0	µg/L
34	Dibromochloromethane	ND	2.0	µg/L
35	1,2-Dibromoethane (EDB)	ND	8.0	µg/L
36	Tetrachloroethene	ND	2.0	µg/L
37	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L
38	Chlorobenzene	ND	2.0	µg/L
39	Ethylbenzene	ND	1.0	µg/L
40	m,p-Xylene	ND	1.0	µg/L
41	Bromoform	ND	2.0	µg/L
42	Styrene	ND	2.0	µg/L
43	o-Xylene	ND	1.0	µg/L
44	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
45	1,2,3-Trichloropropane	ND	8.0	µg/L
46	Isopropylbenzene	ND	2.0	µg/L
47	Bromobenzene	ND	2.0	µg/L
48	n-Propylbenzene	ND	2.0	µg/L
49	4-Chlorotoluene	ND	2.0	µg/L
50	2-Chlorotoluene	ND	2.0	µg/L
51	1,3,5-Trimethylbenzene	ND	2.0	µg/L
52	tert-Butylbenzene	ND	2.0	µg/L
53	1,2,4-Trimethylbenzene	ND	2.0	µg/L
54	sec-Butylbenzene	ND	2.0	µg/L
55	1,3-Dichlorobenzene	ND	2.0	µg/L
56	1,4-Dichlorobenzene	ND	2.0	µg/L
57	4-Isopropyltoluene	ND	2.0	µg/L
58	1,2-Dichlorobenzene	ND	2.0	µg/L
59	n-Butylbenzene	ND	2.0	µg/L
60	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
61	1,2,4-Trichlorobenzene	ND	8.0	µg/L
62	Naphthalene	ND	8.0	µg/L
63	Hexachlorobutadiene	ND	8.0	µg/L
64	1,2,3-Trichlorobenzene	ND	8.0	µg/L
65	Surr: 1,2-Dichloroethane-d4	96		%REC
66	Surr: Toluene-d8	98		%REC
67	Surr: 4-Bromofluorobenzene	102		%REC

Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

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7/23/04
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-01A
Client I.D. Number: 21503-TB01

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	Tetrachloroethene	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Chlorobenzene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	Ethylbenzene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	m,p-Xylene	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	Bromoform	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Styrene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L	43	o-Xylene	ND	0.50	µg/L
9	Dichloromethane	ND	2.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L	45	1,2,3-Trichloropropane	ND	2.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Isopropylbenzene	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L	47	Bromobenzene	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L	48	n-Propylbenzene	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L	49	4-Chlorotoluene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L	50	2-Chlorotoluene	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L	51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L	52	tert-Butylbenzene	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L	53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L	54	sec-Butylbenzene	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L	55	1,3-Dichlorobenzene	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L	56	1,4-Dichlorobenzene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L	57	4-Isopropyltoluene	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L	58	1,2-Dichlorobenzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L	59	n-Butylbenzene	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	3.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L	61	1,2,4-Trichlorobenzene	ND	2.0	µg/L
27	Trichloroethene	ND	1.0	µg/L	62	Naphthalene	ND	2.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L	63	Hexachlorobutadiene	ND	2.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L	64	1,2,3-Trichlorobenzene	ND	2.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	98		%REC
31	1,1,2-Trichloroethane	ND	1.0	µg/L	66	Surr: Toluene-d8	100		%REC
32	Toluene	ND	0.50	µg/L	67	Surr: 4-Bromofluorobenzene	100		%REC
33	1,3-Dichloropropane	ND	1.0	µg/L					
34	Dibromochloromethane	ND	1.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

7/23/04
Report Date

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04071244-02A
Client I.D. Number: 21503-FB01

Sampled: 07/08/04
Received: 07/10/04
Analyzed: 07/14/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	Tetrachloroethene	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Chlorobenzene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	Ethylbenzene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	m,p-Xylene	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	Bromoform	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Styrene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L	43	o-Xylene	ND	0.50	µg/L
9	Dichloromethane	10	2.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L	45	1,2,3-Trichloropropane	ND	2.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Isopropylbenzene	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L	47	Bromobenzene	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L	48	n-Propylbenzene	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L	49	4-Chlorotoluene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L	50	2-Chlorotoluene	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L	51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L	52	tert-Butylbenzene	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L	53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L	54	sec-Butylbenzene	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L	55	1,3-Dichlorobenzene	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L	56	1,4-Dichlorobenzene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L	57	4-Isopropyltoluene	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L	58	1,2-Dichlorobenzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L	59	n-Butylbenzene	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	3.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L	61	1,2,4-Trichlorobenzene	ND	2.0	µg/L
27	Trichloroethene	ND	1.0	µg/L	62	Naphthalene	ND	2.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L	63	Hexachlorobutadiene	ND	2.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L	64	1,2,3-Trichlorobenzene	ND	2.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	98		%REC
31	1,1,2-Trichloroethane	ND	1.0	µg/L	66	Surr: Toluene-d8	100		%REC
32	Toluene	ND	0.50	µg/L	67	Surr: 4-Bromofluorobenzene	103		%REC
33	1,3-Dichloropropane	ND	1.0	µg/L					
34	Dibromochloromethane	ND	1.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

7/23/04
Report Date

Alpha Analytical, Inc.

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VOC pH Report

Work Order BMI04071244 **Project:** TO44

Alpha's Sample ID	Client's Sample ID	Matrix	pH
04071244-01A	21503-TB01	Aqueous	
04071244-02A	21503-FB01	Aqueous	2
04071244-03A	21503-EB01	Aqueous	2
04071244-04A	21503-MW01	Aqueous	2
04071244-05A	21503-MW02	Aqueous	4
04071244-06A	21503-MW03	Aqueous	2
04071244-07A	21503-MW04	Aqueous	2

7/23/04
Report Date

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071406.D** Batch ID: **MS10W0714B** Analysis Date: **07/14/2004 09:08**

Sample ID: **MBLK MS10W0714B** Units : **mg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.00994		0.01		99	72	126			
Surr: Toluene-d8	0.0099		0.01		99	71	128			
Surr: 4-Bromofluorobenzene	0.01		0.01		100	76	121			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071403.D** Batch ID: **MS10W0714B** Analysis Date: **07/14/2004 08:04**

Sample ID: **GLCS MS10W0714B** Units : **mg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	0.455	0.05	0.4		114	67	136			
Surr: 1,2-Dichloroethane-d4	0.00983		0.01		98	72	126			
Surr: Toluene-d8	0.00949		0.01		95	71	128			
Surr: 4-Bromofluorobenzene	0.00967		0.01		97	76	121			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071415.D** Batch ID: **MS10W0714B** Analysis Date: **07/14/2004 12:21**

Sample ID: **04071244-06AGS** Units : **mg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.32	0.25	2	0	116	54	154			
Surr: 1,2-Dichloroethane-d4	0.0511		0.05		102	72	126			
Surr: Toluene-d8	0.0475		0.05		95	71	128			
Surr: 4-Bromofluorobenzene	0.0486		0.05		97	76	121			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071416.D** Batch ID: **MS10W0714B** Analysis Date: **07/14/2004 12:42**

Sample ID: **04071244-06AGSD** Units : **mg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.15	0.25	2	0	108	54	154	2.324	7.6(66)	
Surr: 1,2-Dichloroethane-d4	0.0514		0.05		103	72	126			
Surr: Toluene-d8	0.0475		0.05		95	71	128			
Surr: 4-Bromofluorobenzene	0.0495		0.05		99	76	121			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071406.D** Batch ID: **MS10W0714A** Analysis Date: **07/14/2004 09:08**

Sample ID: **MBLK MS10W0714A** Units : **µg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Tertiary Butyl Alcohol (TBA)	ND	10								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
Di-isopropyl Ether (DIPE)	ND	1								
cis-1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	3								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Surr: 1,2-Dichloroethane-d4	9.94	10	99	72	126
Surr: Toluene-d8	9.9	10	99	71	128
Surr: 4-Bromofluorobenzene	10	10	100	76	121

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071404.D** Batch ID: **MS10W0714A** Analysis Date: **07/14/2004 08:26**

Sample ID: **LCS MS10W0714A** Units : **µg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.79	1	10		98	5	186			
Chloromethane	9.1	2	10		91	49	130			
Vinyl chloride	11.8	1	10		118	80	120			
Chloroethane	13.8	1	10		138	55	145			
Bromomethane	7.24	2	10		72	7	169			
Trichlorofluoromethane	11	1	10		110	62	143			
1,1-Dichloroethene	10.8	1	10		108	80	120			
Dichloromethane	9.97	2	10		99.7	69	123			
trans-1,2-Dichloroethene	11.3	1	10		113	74	124			
1,1-Dichloroethane	11.1	1	10		111	77	121			
cis-1,2-Dichloroethene	11.3	1	10		113	81	132			
Bromochloromethane	10.7	1	10		107	77	124			
Chloroform	9.96	1	10		99.6	80	120			
2,2-Dichloropropane	13.9	1	10		139	51	171			
1,2-Dichloroethane	10.7	1	10		107	68	126			
1,1,1-Trichloroethane	10.4	1	10		104	75	132			
1,1-Dichloropropene	10.9	1	10		109	84	125			
Carbon tetrachloride	10.1	1	10		101	68	144			
Benzene	10.5	0.5	10		105	83	119			
Dibromomethane	10.6	1	10		106	76	128			
1,2-Dichloropropane	10.6	1	10		106	80	120			
Trichloroethene	9.32	1	10		93	76	127			
Bromodichloromethane	10.6	1	10		106	78	128			
cis-1,3-Dichloropropene	11.4	1	10		114	77	128			
trans-1,3-Dichloropropene	11.2	1	10		112	74	135			
1,1,2-Trichloroethane	10.8	1	10		108	78	122			
Toluene	10	0.5	10		100	80	120			
1,3-Dichloropropane	10.9	1	10		109	67	130			
Dibromochloromethane	10.6	1	10		106	68	135			
1,2-Dibromoethane (EDB)	22	2	20		110	68	131			
Tetrachloroethene	10.2	1	10		102	67	138			
1,1,1,2-Tetrachloroethane	10.6	1	10		106	72	134			
Chlorobenzene	10.7	1	10		107	76	124			
Ethylbenzene	10.7	0.5	10		107	80	120			
m,p-Xylene	11.1	0.5	10		111	77	125			
Bromoform	10.9	1	10		109	60	138			
Styrene	11.2	1	10		112	74	130			
o-Xylene	10.3	0.5	10		103	77	124			
1,1,2,2-Tetrachloroethane	12.5	1	10		125	65	136			
1,2,3-Trichloropropane	22.2	2	20		111	70	136			
Isopropylbenzene	11.3	1	10		113	71	139			
Bromobenzene	10.2	1	10		102	70	129			
n-Propylbenzene	10.8	1	10		108	67	140			
4-Chlorotoluene	11	1	10		110	72	131			
2-Chlorotoluene	10.7	1	10		107	71	132			
1,3,5-Trimethylbenzene	10.7	1	10		107	71	137			
tert-Butylbenzene	10.6	1	10		106	72	138			
1,2,4-Trimethylbenzene	10.7	1	10		107	72	136			
sec-Butylbenzene	11.1	1	10		111	66	141			
1,3-Dichlorobenzene	11	1	10		110	77	124			
1,4-Dichlorobenzene	10.8	1	10		108	73	125			
4-Isopropyltoluene	11.2	1	10		112	69	139			
1,2-Dichlorobenzene	10.6	1	10		106	77	118			
n-Butylbenzene	11	1	10		110	62	144			
1,2-Dibromo-3-chloropropane (DBCP)	55.4	3	50		111	0	183			
1,2,4-Trichlorobenzene	10.6	2	10		106	54	144			
Naphthalene	12.3	2	10		123	45	152			
Hexachlorobutadiene	20.3	2	20		102	44	153			
1,2,3-Trichlorobenzene	10.8	2	10		108	41	154			
Surr: 1,2-Dichloroethane-d4	10.1		10		101	72	126			
Surr: Toluene-d8	9.8		10		98	71	128			
Surr: 4-Bromofluorobenzene	9.93		10		99	76	121			

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071417.D** Batch ID: **MS10W0714A** Analysis Date: **07/14/2004 13:03**

Sample ID: **04071244-06AMS** Units : **µg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	47.7	2.5	50	0	95	0	193			
Chloromethane	45.6	10	50	0	91	25	147			
Vinyl chloride	56	2.5	50	0	112	34	153			
Chloroethane	58.8	2.5	50	0	118	18	172			
Bromomethane	28.8	10	50	0	58	0	183			
Trichlorofluoromethane	52.7	2.5	50	0	105	32	163			
1,1-Dichloroethene	48.3	2.5	50	0	97	51	145			
Dichloromethane	49.6	10	50	0	99	47	148			
trans-1,2-Dichloroethene	52.9	2.5	50	0	106	59	142			
1,1-Dichloroethane	52.4	2.5	50	0	105	58	141			
cis-1,2-Dichloroethene	54.6	2.5	50	0	109	51	152			
Bromochloromethane	53.7	2.5	50	0	107	58	145			
Chloroform	48.3	2.5	50	0	97	61	144			
2,2-Dichloropropane	61.1	2.5	50	0	122	22	185			
1,2-Dichloroethane	53.7	2.5	50	0	107	41	151			
1,1,1-Trichloroethane	50.2	2.5	50	0	100	55	153			
1,1-Dichloropropene	51.7	2.5	50	0	103	62	141			
Carbon tetrachloride	47.8	2.5	50	0	96	52	159			
Benzene	51.2	1.3	50	0	102	59	145			
Dibromomethane	54.8	2.5	50	0	110	55	150			
1,2-Dichloropropane	52	2.5	50	0	104	56	148			
Trichloroethene	44.6	2.5	50	0	89	58	142			
Bromodichloromethane	54.2	2.5	50	0	108	54	150			
cis-1,3-Dichloropropene	54.4	2.5	50	0	109	54	143			
trans-1,3-Dichloropropene	53.8	2.5	50	0	108	51	147			
1,1,2-Trichloroethane	56.2	2.5	50	0	112	55	149			
Toluene	48.5	1.3	50	0	97	39	161			
1,3-Dichloropropane	56.4	2.5	50	0	113	53	143			
Dibromochloromethane	53.6	2.5	50	0	107	53	147			
1,2-Dibromoethane (EDB)	114	10	100	0	114	51	146			
Tetrachloroethene	48.2	2.5	50	0	96	56	144			
1,1,1,2-Tetrachloroethane	52.4	2.5	50	0	105	57	147			
Chlorobenzene	52.6	2.5	50	0	105	62	138			
Ethylbenzene	52.2	1.3	50	0	104	57	145			
m,p-Xylene	53.7	1.3	50	0	107	37	163			
Bromoform	56.3	2.5	50	0	113	47	146			
Styrene	55.5	2.5	50	0	111	46	151			
o-Xylene	51.3	1.3	50	0	103	47	156			
1,1,2,2-Tetrachloroethane	66.2	2.5	50	0	132	48	162			
1,2,3-Trichloropropane	114	10	100	0	114	42	161			
Isopropylbenzene	52.7	2.5	50	0	105	48	158			
Bromobenzene	49.4	2.5	50	0	99	51	146			
n-Propylbenzene	50.2	2.5	50	0	100	53	153			
4-Chlorotoluene	51.9	2.5	50	0	104	54	146			
2-Chlorotoluene	50.3	2.5	50	0	101	56	145			
1,3,5-Trimethylbenzene	50.5	2.5	50	0	101	51	152			
tert-Butylbenzene	49.3	2.5	50	0	99	56	154			
1,2,4-Trimethylbenzene	50.8	2.5	50	0	102	47	157			
sec-Butylbenzene	51	2.5	50	0	102	47	154			
1,3-Dichlorobenzene	50.9	2.5	50	0	102	62	137			
1,4-Dichlorobenzene	50.5	2.5	50	0	101	57	142			
4-Isopropyltoluene	51.8	2.5	50	0	104	52	152			
1,2-Dichlorobenzene	50.3	2.5	50	0	101	60	134			
n-Butylbenzene	49.7	2.5	50	0	99	43	158			
1,2-Dibromo-3-chloropropane (DBCP)	288	15	250	0	115	0	419			
1,2,4-Trichlorobenzene	52.2	10	50	0	104	42	161			
Naphthalene	61.1	10	50	0	122	27	178			
Hexachlorobutadiene	93.4	10	100	0	93	0	203			
1,2,3-Trichlorobenzene	52	10	50	0	104	34	171			
Surr: 1,2-Dichloroethane-d4	52.1		50		104	72	126			
Surr: Toluene-d8	48		50		96	71	128			
Surr: 4-Bromofluorobenzene	48.9		50		98	76	121			

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Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\040714\04071418.D** Batch ID: **MS10W0714A** Analysis Date: **07/14/2004 13:24**

Sample ID: **04071244-06AMSD** Units : **µg/L** Run ID: **MSD_10_040714A** Prep Date: **07/14/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	54.4	2.5	50	0	109	0	193	47.67	13.2(28)	
Chloromethane	50.6	10	50	0	101	25	147	45.56	10.6(31)	
Vinyl chloride	61.7	2.5	50	0	123	34	153	55.97	9.7(23)	
Chloroethane	63.6	2.5	50	0	127	18	172	58.79	7.8(43)	
Bromomethane	41	10	50	0	82	0	183	28.79	35.1(54)	
Trichlorofluoromethane	56.7	2.5	50	0	113	32	163	52.71	7.4(25)	
1,1-Dichloroethene	53	2.5	50	0	106	51	145	48.31	9.3(23)	
Dichloromethane	53.7	10	50	0	107	47	148	49.6	7.9(40)	
trans-1,2-Dichloroethene	59.3	2.5	50	0	119	59	142	52.87	11.5(28)	
1,1-Dichloroethane	57.6	2.5	50	0	115	58	141	52.36	9.6(25)	
cis-1,2-Dichloroethene	60.5	2.5	50	0	121	51	152	54.63	10.2(34)	
Bromochloromethane	57.6	2.5	50	0	115	58	145	53.65	7.1(22)	
Chloroform	53.3	2.5	50	0	107	61	144	48.3	9.9(22)	
2,2-Dichloropropane	67.6	2.5	50	0	135	22	185	61.14	10.1(31)	
1,2-Dichloroethane	58.8	2.5	50	0	118	41	151	53.69	9.1(24)	
1,1,1-Trichloroethane	56	2.5	50	0	112	55	153	50.2	10.9(22)	
1,1-Dichloropropene	57.5	2.5	50	0	115	62	141	51.72	10.6(22)	
Carbon tetrachloride	54.8	2.5	50	0	110	52	159	47.82	13.6(23)	
Benzene	56.3	1.3	50	0	113	59	145	51.2	9.5(22)	
Dibromomethane	59.6	2.5	50	0	119	55	150	54.79	8.4(39)	
1,2-Dichloropropane	57.6	2.5	50	0	115	56	148	52.01	10.3(22)	
Trichloroethene	49.3	2.5	50	0	99	58	142	44.59	10.1(22)	
Bromodichloromethane	60.2	2.5	50	0	120	54	150	54.16	10.5(23)	
cis-1,3-Dichloropropene	60.3	2.5	50	0	121	54	143	54.38	10.4(24)	
trans-1,3-Dichloropropene	58.9	2.5	50	0	118	51	147	53.77	9.2(25)	
1,1,2-Trichloroethane	61	2.5	50	0	122	55	149	56.15	8.3(23)	
Toluene	53.5	1.3	50	0	107	39	161	48.54	9.7(22)	
1,3-Dichloropropane	61.1	2.5	50	0	122	53	143	56.39	8.1(23)	
Dibromochloromethane	58.5	2.5	50	0	117	53	147	53.61	8.8(23)	
1,2-Dibromoethane (EDB)	124	10	100	0	124	51	146	113.8	8.9(24)	
Tetrachloroethene	53	2.5	50	0	106	56	144	48.18	9.5(23)	
1,1,1,2-Tetrachloroethane	56.9	2.5	50	0	114	57	147	52.41	8.2(30)	
Chlorobenzene	57.7	2.5	50	0	115	62	138	52.6	9.3(21)	
Ethylbenzene	56.2	1.3	50	0	112	57	145	52.21	7.4(22)	
m,p-Xylene	58.4	1.3	50	0	117	37	163	53.67	8.5(23)	
Bromoform	62	2.5	50	0	124	47	146	56.34	9.5(25)	
Styrene	60.5	2.5	50	0	121	46	151	55.47	8.6(33)	
o-Xylene	55.5	1.3	50	0	111	47	156	51.33	7.8(50)	
1,1,2,2-Tetrachloroethane	71.2	2.5	50	0	142	48	162	66.15	7.3(24)	
1,2,3-Trichloropropane	122	10	100	0	122	42	161	114.4	6.5(25)	
Isopropylbenzene	59.8	2.5	50	0	120	48	158	52.69	12.6(23)	
Bromobenzene	55.5	2.5	50	0	111	51	146	49.44	11.5(23)	
n-Propylbenzene	56.5	2.5	50	0	113	53	153	50.19	11.9(35)	
4-Chlorotoluene	58.3	2.5	50	0	117	54	146	51.87	11.7(24)	
2-Chlorotoluene	57.3	2.5	50	0	115	56	145	50.27	13.1(24)	
1,3,5-Trimethylbenzene	56	2.5	50	0	112	51	152	50.47	10.3(23)	
tert-Butylbenzene	56.5	2.5	50	0	113	56	154	49.27	13.6(23)	
1,2,4-Trimethylbenzene	56.6	2.5	50	0	113	47	157	50.79	10.8(23)	
sec-Butylbenzene	58.4	2.5	50	0	117	47	154	50.99	13.6(23)	
1,3-Dichlorobenzene	57.6	2.5	50	0	115	62	137	50.94	12.3(22)	
1,4-Dichlorobenzene	57.2	2.5	50	0	114	57	142	50.49	12.4(23)	
4-Isopropyltoluene	58.3	2.5	50	0	117	52	152	51.78	11.9(23)	
1,2-Dichlorobenzene	56.1	2.5	50	0	112	60	134	50.25	11.0(22)	
n-Butylbenzene	56.3	2.5	50	0	113	43	158	49.7	12.4(23)	
1,2-Dibromo-3-chloropropane (DBCP)	320	15	250	0	128	0	419	287.5	10.8(36)	
1,2,4-Trichlorobenzene	61.6	10	50	0	123	42	161	52.19	16.5(28)	
Naphthalene	73.9	10	50	0	148	27	178	61.12	18.9(33)	
Hexachlorobutadiene	110	10	100	0	110	0	203	93.37	16.3(27)	
1,2,3-Trichlorobenzene	65.2	10	50	0	130	34	171	51.97	22.6(48)	
Surr: 1,2-Dichloroethane-d4	51.4		50		103	72	126			
Surr: Toluene-d8	48.1		50		96	71	128			
Surr: 4-Bromofluorobenzene	50.5		50		101	76	121			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *27-Jul-04*

QC Summary Report

Work Order: 04071244

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name Alpha Analytical Inc.
Address 255 Glendale Ave, Suite 21
SPARKS, NV. 89431
Phone 800 283 1183

Page # _____ of _____

Client Name **Battelle Memorial Institute**	P.O. # Will PAY BY VISA	D.O. TO44	
Address **505 King Avenue**	PWS #	DWR #	
City, State, Zip **Columbus, OH 43201**	Phone # 614 424 - 3779	Fax # 614 424 3667	
	Sampled by GH/MW	Report Attention CHRIS ZIMMERMAN	

Analyses Required / DATA REPORT

NEDTS FORMAT X
EDF FORMAT X

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	TPH/P GAS	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other:	Other:	REMARKS
—	7-8	AQ		21503-TB01	1V							X			
1410	7-8	AQ		21503-FB01	3V							X			
1448	7-8	AQ		21503-EB01	3V		X								
1520	7-8	AQ		21503-MW01	6V		X					X			
1428	7-8	AQ		21503-MW02	6V		X					X			
1430	7-8	AQ		21503-MW03	6V		X					X			
1510	7-8	AQ		21503-MW04	6V		X					X			

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** see attached list.

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	GREG HEADINGTON	BATTELLE	~~08~~ GH 09JUL04	0815
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667

Job : TO44
PO : credit card
Client's COC # : none

WorkOrder : BMI04071244

Report Due By : 5:00 PM On : 26-Jul-04

EDD Required : **Yes**
Sampled by : GH/MW
Cooler Temp : **3 °C**

12-Jul-04

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	TPH/P_W	VOC_W	Requested Tests			Sample Remarks
BMI04071244-01A	21503-TB01	AQ	07/08/04 00:00	1	0	10			8260_C/5oxy s				TB-Reno 06/14/04
BMI04071244-02A	21503-FB01	AQ	07/08/04 14:10	3	0	10			8260_C/5oxy s				
BMI04071244-03A	21503-EB01	AQ	07/08/04 14:48	3	0	10		GAS-C					
BMI04071244-04A	21503-MW01	AQ	07/08/04 15:20	6	0	10		GAS-C	8260_C/5oxy s				
BMI04071244-05A	21503-MW02	AQ	07/08/04 14:28	6	0	10		GAS-C	8260_C/5oxy s				
BMI04071244-06A	21503-MW03	AQ	07/08/04 14:30	6	0	10		GAS-C	8260_C/5oxy s				
BMI04071244-07A	21503-MW04	AQ	07/08/04 15:10	6	0	10		GAS-C	8260_C/5oxy s				

Comments: No custody seal. Frozen ice. Samples received 07/10/04, samples kept cold & secure until log-in 07/12/04. Temp Blanks #3949. Needs NEDTS & EDF format. Samples should be used as the control spike sample if possible. "If Jet Fuel is seen, report as Diesel : and Footnote report" EDF Global ID T0607301591.

	Signature	Print Name	Company	Date/Time
Received by:	DSBaker	DSBaker	Alpha Analytical, Inc.	7/12/04 1045

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY

Name Alpha Analytical Inc.
Address 255 Glendale Ave, Suite 21
SPARKS, NV. 89431
Phone 800 283 1183

Page # _____ of _____

Client Name **Battelle Memorial Institute**	P.O. # Will PAY BY VISA	D.O. T044	
Address **505 King Avenue**	PWS #	DWR #	
City, State, Zip **Columbus, OH 43201**	Phone # 614 424 – 3779	Fax # 614 424 3667	
Sampled by GH / MW	Report Attention CHRIS ZIMMERMAN		

Analyses Required

DATA REPORT: NEDTS FORMAT X; EDF FORMAT X

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	TPH/P GAS	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other:	Other:	REMARKS
—	7-8	AQ	BMI04071244-01	21503-TB01	1V							X			Rec 4°C
1410	7-8	AQ	-02	21503-FB01	3V							X			
1448	7-8	AQ	-03	21503-EB01	3V		X								
1520	7-8	AQ	-04	21503-MW01	6V		X					X			
1428	7-8	AQ	-05	21503-MW02	6V		X					X			
1430	7-8	AQ	-06	21503-MW03	6V		X					X			
1510	7-8	AQ	-07	21503-MW04	6V		X					X			

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** see Attached list.

Temp Blank #3949 @ 3°c

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	GREG HEADINGTON	BATTELLE	~~08~~ GH 09JUL04	0815
Received by	[signature]	Rick OVERTON	AAI	7/10/04	0925
Relinquished by					
~~Received by~~	[signature] DSBoker	DSBoker	alpha	7/12/04	1045
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOVEMBER 2004

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *02-Dec-04*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-7358

CASE NARRATIVE

Project: TO44-21503
Work Order: BMI04111846 **Cooler Temp:** 5 °C

Alpha's Sample ID	Client's Sample ID	Matrix
04111846-01A	21503-MW01	Aqueous
04111846-02A	21503-MW02	Aqueous
04111846-03A	21503-MW03	Aqueous
04111846-04A	21503-MW04	Aqueous
04111846-05A	21503-EB01	Aqueous
04111846-06A	21503-FB01	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone (614) 424-3779
Fax: (614) 424-3667
Date Received 11/18/04

Job#: TO44-21503

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**21503-MW01**						
Lab ID :	BMI04111846-01A	TPH Purgeable	8.1		1.0 mg/L	11/17/04	11/20/04
		Surr: 1,2-Dichloroethane-d4	101		%REC	11/17/04	11/20/04
		Surr: Toluene-d8	94		%REC	11/17/04	11/20/04
		Surr: 4-Bromofluorobenzene	95		%REC	11/17/04	11/20/04
Client ID :	**21503-MW02**						
Lab ID :	BMI04111846-02A	TPH Purgeable	ND	O	0.20 mg/L	11/17/04	11/20/04
		Surr: 1,2-Dichloroethane-d4	100		%REC	11/17/04	11/20/04
		Surr: Toluene-d8	98		%REC	11/17/04	11/20/04
		Surr: 4-Bromofluorobenzene	104		%REC	11/17/04	11/20/04
Client ID :	**21503-MW03**						
Lab ID :	BMI04111846-03A	TPH Purgeable	ND	O	0.10 mg/L	11/17/04	11/20/04
		Surr: 1,2-Dichloroethane-d4	102		%REC	11/17/04	11/20/04
		Surr: Toluene-d8	101		%REC	11/17/04	11/20/04
		Surr: 4-Bromofluorobenzene	104		%REC	11/17/04	11/20/04
Client ID :	**21503-MW04**						
Lab ID :	BMI04111846-04A	TPH Purgeable	ND	O	0.20 mg/L	11/17/04	11/20/04
		Surr: 1,2-Dichloroethane-d4	98		%REC	11/17/04	11/20/04
		Surr: Toluene-d8	102		%REC	11/17/04	11/20/04
		Surr: 4-Bromofluorobenzene	107		%REC	11/17/04	11/20/04
Client ID :	**21503-EB01**						
Lab ID :	BMI04111846-05A	TPH Purgeable	ND		0.050 mg/L	11/17/04	11/20/04
		Surr: 1,2-Dichloroethane-d4	101		%REC	11/17/04	11/20/04
		Surr: Toluene-d8	100		%REC	11/17/04	11/20/04
		Surr: 4-Bromofluorobenzene	106		%REC	11/17/04	11/20/04

O = Reporting Limits were increased due to sample foaming.
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

12/2/04
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44-21503

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04111846-01A
Client I.D. Number: 21503-MW01

Sampled: 11/17/04
Received: 11/18/04
Analyzed: 11/20/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	10	µg/L
2	Chloromethane	ND	40	µg/L
3	Vinyl chloride	ND	10	µg/L
4	Chloroethane	ND	10	µg/L
5	Bromomethane	ND	40	µg/L
6	Trichlorofluoromethane	ND	10	µg/L
7	1,1-Dichloroethene	ND	10	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	100	µg/L
9	Dichloromethane	ND	40	µg/L
10	trans-1,2-Dichloroethene	ND	10	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	5.0	µg/L
12	1,1-Dichloroethane	ND	10	µg/L
13	Di-isopropyl Ether (DIPE)	ND	10	µg/L
14	cis-1,2-Dichloroethene	ND	10	µg/L
15	Bromochloromethane	ND	10	µg/L
16	Chloroform	ND	10	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	10	µg/L
18	2,2-Dichloropropane	ND	10	µg/L
19	1,2-Dichloroethane	ND	10	µg/L
20	1,1,1-Trichloroethane	ND	10	µg/L
21	1,1-Dichloropropene	ND	10	µg/L
22	Carbon tetrachloride	ND	10	µg/L
23	Benzene	ND	5.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	10	µg/L
25	Dibromomethane	ND	10	µg/L
26	1,2-Dichloropropane	ND	10	µg/L
27	Trichloroethene	ND	10	µg/L
28	Bromodichloromethane	ND	10	µg/L
29	cis-1,3-Dichloropropene	ND	10	µg/L
30	trans-1,3-Dichloropropene	ND	10	µg/L
31	1,1,2-Trichloroethane	ND	10	µg/L
32	Toluene	ND	5.0	µg/L
33	1,3-Dichloropropane	ND	10	µg/L
34	Dibromochloromethane	ND	10	µg/L
35	1,2-Dibromoethane (EDB)	ND	40	µg/L
36	Tetrachloroethene	ND	10	µg/L
37	1,1,1,2-Tetrachloroethane	ND	10	µg/L
38	Chlorobenzene	ND	10	µg/L
39	Ethylbenzene	1,400	5.0	µg/L
40	m,p-Xylene	100	5.0	µg/L
41	Bromoform	ND	10	µg/L
42	Styrene	ND	10	µg/L
43	o-Xylene	ND	5.0	µg/L
44	1,1,2,2-Tetrachloroethane	ND	10	µg/L
45	1,2,3-Trichloropropane	ND	40	µg/L
46	Isopropylbenzene	110	10	µg/L
47	Bromobenzene	ND	10	µg/L
48	n-Propylbenzene	350	10	µg/L
49	4-Chlorotoluene	ND	10	µg/L
50	2-Chlorotoluene	ND	10	µg/L
51	1,3,5-Trimethylbenzene	42	10	µg/L
52	tert-Butylbenzene	ND	10	µg/L
53	1,2,4-Trimethylbenzene	220	10	µg/L
54	sec-Butylbenzene	29	10	µg/L
55	1,3-Dichlorobenzene	ND	10	µg/L
56	1,4-Dichlorobenzene	ND	10	µg/L
57	4-Isopropyltoluene	ND	10	µg/L
58	1,2-Dichlorobenzene	ND	10	µg/L
59	n-Butylbenzene	33	10	µg/L
60	1,2-Dibromo-3-chloropropane (DBCP)	ND	60	µg/L
61	1,2,4-Trichlorobenzene	ND	40	µg/L
62	Naphthalene	400	40	µg/L
63	Hexachlorobutadiene	ND	40	µg/L
64	1,2,3-Trichlorobenzene	ND	40	µg/L
65	Surr: 1,2-Dichloroethane-d4	101		%REC
66	Surr: Toluene-d8	94		%REC
67	Surr: 4-Bromofluorobenzene	95		%REC

Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

12/2/04
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44-21503

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04111846-02A
Client I.D. Number: 21503-MW02

Sampled: 11/17/04
Received: 11/18/04
Analyzed: 11/20/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L	36	Tetrachloroethene	ND	2.0	µg/L
2	Chloromethane	ND	8.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L	38	Chlorobenzene	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L	39	Ethylbenzene	ND	1.0	µg/L
5	Bromomethane	ND	8.0	µg/L	40	m,p-Xylene	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L	41	Bromoform	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L	42	Styrene	ND	2.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	20	µg/L	43	o-Xylene	ND	1.0	µg/L
9	Dichloromethane	ND	8.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
10	trans-1,2-Dichloroethene	ND	2.0	µg/L	45	1,2,3-Trichloropropane	ND	8.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	46	Isopropylbenzene	ND	2.0	µg/L
12	1,1-Dichloroethane	ND	2.0	µg/L	47	Bromobenzene	ND	2.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	2.0	µg/L	48	n-Propylbenzene	ND	2.0	µg/L
14	cis-1,2-Dichloroethene	ND	2.0	µg/L	49	4-Chlorotoluene	ND	2.0	µg/L
15	Bromochloromethane	ND	2.0	µg/L	50	2-Chlorotoluene	ND	2.0	µg/L
16	Chloroform	ND	2.0	µg/L	51	1,3,5-Trimethylbenzene	ND	2.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	2.0	µg/L	52	tert-Butylbenzene	ND	2.0	µg/L
18	2,2-Dichloropropane	ND	2.0	µg/L	53	1,2,4-Trimethylbenzene	ND	2.0	µg/L
19	1,2-Dichloroethane	ND	2.0	µg/L	54	sec-Butylbenzene	ND	2.0	µg/L
20	1,1,1-Trichloroethane	ND	2.0	µg/L	55	1,3-Dichlorobenzene	ND	2.0	µg/L
21	1,1-Dichloropropene	ND	2.0	µg/L	56	1,4-Dichlorobenzene	ND	2.0	µg/L
22	Carbon tetrachloride	ND	2.0	µg/L	57	4-Isopropyltoluene	ND	2.0	µg/L
23	Benzene	ND	1.0	µg/L	58	1,2-Dichlorobenzene	ND	2.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	2.0	µg/L	59	n-Butylbenzene	ND	2.0	µg/L
25	Dibromomethane	ND	2.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
26	1,2-Dichloropropane	ND	2.0	µg/L	61	1,2,4-Trichlorobenzene	ND	8.0	µg/L
27	Trichloroethene	ND	2.0	µg/L	62	Naphthalene	ND	8.0	µg/L
28	Bromodichloromethane	ND	2.0	µg/L	63	Hexachlorobutadiene	ND	8.0	µg/L
29	cis-1,3-Dichloropropene	ND	2.0	µg/L	64	1,2,3-Trichlorobenzene	ND	8.0	µg/L
30	trans-1,3-Dichloropropene	ND	2.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	100		%REC
31	1,1,2-Trichloroethane	ND	2.0	µg/L	66	Surr: Toluene-d8	98		%REC
32	Toluene	ND	1.0	µg/L	67	Surr: 4-Bromofluorobenzene	104		%REC
33	1,3-Dichloropropane	ND	2.0	µg/L					
34	Dibromochloromethane	ND	2.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	8.0	µg/L					

Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

12/2/04
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44-21503

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04111846-03A
Client I.D. Number: 21503-MW03

Sampled: 11/17/04
Received: 11/18/04
Analyzed: 11/20/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	Tetrachloroethene	ND	1.0	µg/L
2	Chloromethane	ND	4.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Chlorobenzene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	Ethylbenzene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	m,p-Xylene	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	Bromoform	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Styrene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L	43	o-Xylene	ND	0.50	µg/L
9	Dichloromethane	ND	4.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L	45	1,2,3-Trichloropropane	ND	4.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Isopropylbenzene	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L	47	Bromobenzene	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L	48	n-Propylbenzene	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L	49	4-Chlorotoluene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L	50	2-Chlorotoluene	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L	51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L	52	tert-Butylbenzene	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L	53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L	54	sec-Butylbenzene	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L	55	1,3-Dichlorobenzene	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L	56	1,4-Dichlorobenzene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L	57	4-Isopropyltoluene	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L	58	1,2-Dichlorobenzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L	59	n-Butylbenzene	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L	61	1,2,4-Trichlorobenzene	ND	4.0	µg/L
27	Trichloroethene	ND	1.0	µg/L	62	Naphthalene	ND	4.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L	63	Hexachlorobutadiene	ND	4.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L	64	1,2,3-Trichlorobenzene	ND	4.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	102		%REC
31	1,1,2-Trichloroethane	ND	1.0	µg/L	66	Surr: Toluene-d8	101		%REC
32	Toluene	ND	0.50	µg/L	67	Surr: 4-Bromofluorobenzene	104		%REC
33	1,3-Dichloropropane	ND	1.0	µg/L					
34	Dibromochloromethane	ND	1.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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12/2/04
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44-21503

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04111846-04A
Client I.D. Number: 21503-MW04

Sampled: 11/17/04
Received: 11/18/04
Analyzed: 11/20/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L	36	Tetrachloroethene	ND	2.0	µg/L
2	Chloromethane	ND	8.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L	38	Chlorobenzene	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L	39	Ethylbenzene	ND	1.0	µg/L
5	Bromomethane	ND	8.0	µg/L	40	m,p-Xylene	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L	41	Bromoform	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L	42	Styrene	ND	2.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	20	µg/L	43	o-Xylene	ND	1.0	µg/L
9	Dichloromethane	ND	8.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
10	trans-1,2-Dichloroethene	ND	2.0	µg/L	45	1,2,3-Trichloropropane	ND	8.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	46	Isopropylbenzene	ND	2.0	µg/L
12	1,1-Dichloroethane	ND	2.0	µg/L	47	Bromobenzene	ND	2.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	2.0	µg/L	48	n-Propylbenzene	ND	2.0	µg/L
14	cis-1,2-Dichloroethene	ND	2.0	µg/L	49	4-Chlorotoluene	ND	2.0	µg/L
15	Bromochloromethane	ND	2.0	µg/L	50	2-Chlorotoluene	ND	2.0	µg/L
16	Chloroform	ND	2.0	µg/L	51	1,3,5-Trimethylbenzene	ND	2.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	2.0	µg/L	52	tert-Butylbenzene	ND	2.0	µg/L
18	2,2-Dichloropropane	ND	2.0	µg/L	53	1,2,4-Trimethylbenzene	ND	2.0	µg/L
19	1,2-Dichloroethane	ND	2.0	µg/L	54	sec-Butylbenzene	ND	2.0	µg/L
20	1,1,1-Trichloroethane	ND	2.0	µg/L	55	1,3-Dichlorobenzene	ND	2.0	µg/L
21	1,1-Dichloropropene	ND	2.0	µg/L	56	1,4-Dichlorobenzene	ND	2.0	µg/L
22	Carbon tetrachloride	ND	2.0	µg/L	57	4-Isopropyltoluene	ND	2.0	µg/L
23	Benzene	ND	1.0	µg/L	58	1,2-Dichlorobenzene	ND	2.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	2.0	µg/L	59	n-Butylbenzene	ND	2.0	µg/L
25	Dibromomethane	ND	2.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
26	1,2-Dichloropropane	ND	2.0	µg/L	61	1,2,4-Trichlorobenzene	ND	8.0	µg/L
27	Trichloroethene	ND	2.0	µg/L	62	Naphthalene	ND	8.0	µg/L
28	Bromodichloromethane	ND	2.0	µg/L	63	Hexachlorobutadiene	ND	8.0	µg/L
29	cis-1,3-Dichloropropene	ND	2.0	µg/L	64	1,2,3-Trichlorobenzene	ND	8.0	µg/L
30	trans-1,3-Dichloropropene	ND	2.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	98		%REC
31	1,1,2-Trichloroethane	ND	2.0	µg/L	66	Surr: Toluene-d8	102		%REC
32	Toluene	ND	1.0	µg/L	67	Surr: 4-Bromofluorobenzene	107		%REC
33	1,3-Dichloropropane	ND	2.0	µg/L					
34	Dibromochloromethane	ND	2.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	8.0	µg/L					

Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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12/2/04
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO44-21503

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI04111846-06A
Client I.D. Number: 21503-FB01

Sampled: 11/17/04
Received: 11/18/04
Analyzed: 11/20/04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	Tetrachloroethene	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L	37	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Chlorobenzene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	Ethylbenzene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	m,p-Xylene	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	Bromoform	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Styrene	ND	1.0	µg/L
8	Tertiary Butyl Alcohol (TBA)	ND	10	µg/L	43	o-Xylene	ND	0.50	µg/L
9	Dichloromethane	ND	2.0	µg/L	44	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	1.0	µg/L	45	1,2,3-Trichloropropane	ND	2.0	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Isopropylbenzene	ND	1.0	µg/L
12	1,1-Dichloroethane	ND	1.0	µg/L	47	Bromobenzene	ND	1.0	µg/L
13	Di-isopropyl Ether (DIPE)	ND	1.0	µg/L	48	n-Propylbenzene	ND	1.0	µg/L
14	cis-1,2-Dichloroethene	ND	1.0	µg/L	49	4-Chlorotoluene	ND	1.0	µg/L
15	Bromochloromethane	ND	1.0	µg/L	50	2-Chlorotoluene	ND	1.0	µg/L
16	Chloroform	ND	1.0	µg/L	51	1,3,5-Trimethylbenzene	ND	1.0	µg/L
17	Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0	µg/L	52	tert-Butylbenzene	ND	1.0	µg/L
18	2,2-Dichloropropane	ND	1.0	µg/L	53	1,2,4-Trimethylbenzene	ND	1.0	µg/L
19	1,2-Dichloroethane	ND	1.0	µg/L	54	sec-Butylbenzene	ND	1.0	µg/L
20	1,1,1-Trichloroethane	ND	1.0	µg/L	55	1,3-Dichlorobenzene	ND	1.0	µg/L
21	1,1-Dichloropropene	ND	1.0	µg/L	56	1,4-Dichlorobenzene	ND	1.0	µg/L
22	Carbon tetrachloride	ND	1.0	µg/L	57	4-Isopropyltoluene	ND	1.0	µg/L
23	Benzene	ND	0.50	µg/L	58	1,2-Dichlorobenzene	ND	1.0	µg/L
24	Tertiary Amyl Methyl Ether (TAME)	ND	1.0	µg/L	59	n-Butylbenzene	ND	1.0	µg/L
25	Dibromomethane	ND	1.0	µg/L	60	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
26	1,2-Dichloropropane	ND	1.0	µg/L	61	1,2,4-Trichlorobenzene	ND	2.0	µg/L
27	Trichloroethene	ND	1.0	µg/L	62	Naphthalene	ND	2.0	µg/L
28	Bromodichloromethane	ND	1.0	µg/L	63	Hexachlorobutadiene	ND	2.0	µg/L
29	cis-1,3-Dichloropropene	ND	1.0	µg/L	64	1,2,3-Trichlorobenzene	ND	2.0	µg/L
30	trans-1,3-Dichloropropene	ND	1.0	µg/L	65	Surr: 1,2-Dichloroethane-d4	101		%REC
31	1,1,2-Trichloroethane	ND	1.0	µg/L	66	Surr: Toluene-d8	100		%REC
32	Toluene	ND	0.50	µg/L	67	Surr: 4-Bromofluorobenzene	106		%REC
33	1,3-Dichloropropane	ND	1.0	µg/L					
34	Dibromochloromethane	ND	1.0	µg/L					
35	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					

ND = Not Detected

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12/2/04
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC pH Report

Work Order: BMI04111846 **Project:** TO44-21503

Alpha's Sample ID	Client's Sample ID	Matrix	pH
04111846-01A	21503-MW01	Aqueous	2
04111846-02A	21503-MW02	Aqueous	2
04111846-03A	21503-MW03	Aqueous	2
04111846-04A	21503-MW04	Aqueous	2
04111846-05A	21503-EB01	Aqueous	2
04111846-06A	21503-FB01	Aqueous	2

12/2/04
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111937.D** Batch ID: **MS10W1119D** Analysis Date: **11/19/2004 20:25**

Sample ID: **MBLK MS10W1119D** Units : **mg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0103		0.01		103	72	126			
Surr: Toluene-d8	0.01		0.01		100	71	128			
Surr: 4-Bromofluorobenzene	0.0106		0.01		106	76	121			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111931.D** Batch ID: **MS10W1119D** Analysis Date: **11/19/2004 18:18**

Sample ID: **GLCS MS10W1119D** Units : **mg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	0.429	0.05	0.4		107	67	136			
Surr: 1,2-Dichloroethane-d4	0.0105		0.01		105	72	126			
Surr: Toluene-d8	0.00956		0.01		96	71	128			
Surr: 4-Bromofluorobenzene	0.00994		0.01		99	76	121			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111946.D** Batch ID: **MS10W1119D** Analysis Date: **11/19/2004 23:33**

Sample ID: **04111846-04AGS** Units : **mg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.06	0.25	2	0	103	54	154			
Surr: 1,2-Dichloroethane-d4	0.0501		0.05		100	72	126			
Surr: Toluene-d8	0.0489		0.05		98	71	128			
Surr: 4-Bromofluorobenzene	0.0519		0.05		104	76	121			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111947.D** Batch ID: **MS10W1119D** Analysis Date: **11/19/2004 23:54**

Sample ID: **04111846-04AGSD** Units : **mg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.06	0.25	2	0	103	54	154	2.056	0.2(66)	
Surr: 1,2-Dichloroethane-d4	0.0507		0.05		101	72	126			
Surr: Toluene-d8	0.0493		0.05		99	71	128			
Surr: 4-Bromofluorobenzene	0.0519		0.05		104	76	121			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111937.D** Batch ID: **MS10W1119C** Analysis Date: **11/19/2004 20:25**

Sample ID: **MBLK MS10W1119C** Units : **µg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Tertiary Butyl Alcohol (TBA)	ND	10								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
Di-isopropyl Ether (DIPE)	ND	1								
cis-1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	5								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								

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QC Summary Report

Work Order: 04111846

Surr: 1,2-Dichloroethane-d4	10.3	10	103	72	126
Surr: Toluene-d8	10	10	100	71	128
Surr: 4-Bromofluorobenzene	10.6	10	106	76	121

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Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111933.D** Batch ID: **MS10W1119C** Analysis Date: **11/19/2004 19:01**

Sample ID: **LCS MS10W1119C** Units : **µg/L** Run ID: **MSD_10_041119A** Prep Date: **11/19/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.2	1	10		82	5	186			
Chloromethane	8.63	2	10		86	49	130			
Vinyl chloride	10.6	1	10		106	80	120			
Chloroethane	9.02	1	10		90	55	145			
Bromomethane	9.53	2	10		95	7	169			
Trichlorofluoromethane	11.3	1	10		113	62	143			
1,1-Dichloroethene	11	1	10		110	80	120			
Dichloromethane	9.38	2	10		94	69	123			
trans-1,2-Dichloroethene	10.9	1	10		109	74	124			
1,1-Dichloroethane	11.1	1	10		111	77	121			
cis-1,2-Dichloroethene	10.7	1	10		107	81	132			
Bromochloromethane	10.5	1	10		105	77	124			
Chloroform	10.1	1	10		101	80	120			
2,2-Dichloropropane	10.5	1	10		105	51	171			
1,2-Dichloroethane	11.2	1	10		112	68	126			
1,1,1-Trichloroethane	10.6	1	10		106	75	132			
1,1-Dichloropropene	11.6	1	10		116	84	125			
Carbon tetrachloride	10.6	1	10		106	68	144			
Benzene	10.6	0.5	10		106	83	119			
Dibromomethane	10.6	1	10		106	76	128			
1,2-Dichloropropane	10.5	1	10		105	80	120			
Trichloroethene	10.8	1	10		108	76	127			
Bromodichloromethane	10.8	1	10		108	78	128			
cis-1,3-Dichloropropene	10.3	1	10		103	77	128			
trans-1,3-Dichloropropene	10.1	1	10		101	74	135			
1,1,2-Trichloroethane	10.7	1	10		107	78	122			
Toluene	10.5	0.5	10		105	80	120			
1,3-Dichloropropane	10.6	1	10		106	67	130			
Dibromochloromethane	9.95	1	10		100	68	135			
1,2-Dibromoethane (EDB)	20.9	2	20		104	68	131			
Tetrachloroethene	10.7	1	10		107	67	138			
1,1,1,2-Tetrachloroethane	10.6	1	10		106	72	134			
Chlorobenzene	11.1	1	10		111	76	124			
Ethylbenzene	10.5	0.5	10		105	80	120			
m,p-Xylene	9.76	0.5	10		98	77	125			
Bromoform	10.4	1	10		104	60	138			
Styrene	10.6	1	10		106	74	130			
o-Xylene	9.66	0.5	10		97	77	124			
1,1,2,2-Tetrachloroethane	9.79	1	10		98	65	136			
1,2,3-Trichloropropane	23.2	2	20		116	70	136			
Isopropylbenzene	11.3	1	10		113	71	139			
Bromobenzene	11.5	1	10		115	70	129			
n-Propylbenzene	10.7	1	10		107	67	140			
4-Chlorotoluene	10.5	1	10		105	72	131			
2-Chlorotoluene	11.1	1	10		111	71	132			
1,3,5-Trimethylbenzene	10	1	10		100	71	137			
tert-Butylbenzene	10.4	1	10		104	72	138			
1,2,4-Trimethylbenzene	9.22	1	10		92	72	136			
sec-Butylbenzene	10.2	1	10		102	66	141			
1,3-Dichlorobenzene	10.8	1	10		108	77	124			
1,4-Dichlorobenzene	9.74	1	10		97	73	125			
4-Isopropyltoluene	9.39	1	10		94	69	139			
1,2-Dichlorobenzene	10.2	1	10		102	77	118			
n-Butylbenzene	8.38	1	10		84	62	144			
1,2-Dibromo-3-chloropropane (DBCP)	48.9	3	50		98	0	183			
1,2,4-Trichlorobenzene	9.45	2	10		95	54	144			
Naphthalene	9.33	2	10		93	45	152			
Hexachlorobutadiene	18.2	2	20		91	44	153			
1,2,3-Trichlorobenzene	9.17	2	10		92	41	154			
Surr: 1,2-Dichloroethane-d4	10.9		10		109	72	126			
Surr: Toluene-d8	9.98		10		99.8	71	128			
Surr: 4-Bromofluorobenzene	10.3		10		103	76	121			

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Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111948.D** Batch ID: **MS10W1119C** Analysis Date: **11/20/2004 00:14**

Sample ID: **04111846-04AMS** Units : **µg/L** Run ID: **MSD_10_041119A** Prep Date: **11/20/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	26.7	2.5	50	0	53	0	193			
Chloromethane	37.6	10	50	0	75	25	147			
Vinyl chloride	47.4	2.5	50	0	95	34	153			
Chloroethane	61.1	2.5	50	0	122	18	172			
Bromomethane	33.9	10	50	0	68	0	183			
Trichlorofluoromethane	51.8	2.5	50	0	104	32	163			
1,1-Dichloroethene	49.6	2.5	50	0	99	51	145			
Dichloromethane	46.3	10	50	0	93	47	148			
trans-1,2-Dichloroethene	51.6	2.5	50	0	103	59	142			
1,1-Dichloroethane	53.4	2.5	50	0	107	58	141			
cis-1,2-Dichloroethene	51.2	2.5	50	0	102	51	152			
Bromochloromethane	50.7	2.5	50	0	101	58	145			
Chloroform	49	2.5	50	0	98	61	144			
2,2-Dichloropropane	44.6	2.5	50	0	89	22	185			
1,2-Dichloroethane	53.5	2.5	50	0	107	41	151			
1,1,1-Trichloroethane	50.2	2.5	50	0	100	55	153			
1,1-Dichloropropene	54.9	2.5	50	0	110	62	141			
Carbon tetrachloride	50.1	2.5	50	0	100	52	159			
Benzene	50.3	1.3	50	0	101	59	145			
Dibromomethane	50.8	2.5	50	0	102	55	150			
1,2-Dichloropropane	50.1	2.5	50	0	100	56	148			
Trichloroethene	50.8	2.5	50	0	102	58	142			
Bromodichloromethane	53.1	2.5	50	0	106	54	150			
cis-1,3-Dichloropropene	44	2.5	50	0	88	54	143			
trans-1,3-Dichloropropene	44.4	2.5	50	0	89	51	147			
1,1,2-Trichloroethane	50.9	2.5	50	0	102	55	149			
Toluene	50.7	1.3	50	0	101	39	161			
1,3-Dichloropropane	51.4	2.5	50	0	103	53	143			
Dibromochloromethane	49.3	2.5	50	0	99	53	147			
1,2-Dibromoethane (EDB)	100	10	100	0	100	51	146			
Tetrachloroethene	48.1	2.5	50	0	96	56	144			
1,1,1,2-Tetrachloroethane	53.2	2.5	50	0	106	57	147			
Chlorobenzene	55	2.5	50	0	110	62	138			
Ethylbenzene	51.2	1.3	50	0	102	57	145			
m,p-Xylene	47.8	1.3	50	0	96	37	163			
Bromoform	51.7	2.5	50	0	103	47	146			
Styrene	52.1	2.5	50	0	104	46	151			
o-Xylene	47.7	1.3	50	0	95	47	156			
1,1,2,2-Tetrachloroethane	50.3	2.5	50	0	101	48	162			
1,2,3-Trichloropropane	117	10	100	0	117	42	161			
Isopropylbenzene	57.9	2.5	50	0	116	48	158			
Bromobenzene	58.6	2.5	50	0	117	51	146			
n-Propylbenzene	53.9	2.5	50	0	108	53	153			
4-Chlorotoluene	53.6	2.5	50	0	107	54	146			
2-Chlorotoluene	57.2	2.5	50	0	114	56	145			
1,3,5-Trimethylbenzene	50.7	2.5	50	0	101	51	152			
tert-Butylbenzene	52.8	2.5	50	0	106	56	154			
1,2,4-Trimethylbenzene	47.2	2.5	50	0	94	47	157			
sec-Butylbenzene	51.1	2.5	50	0	102	47	154			
1,3-Dichlorobenzene	54.8	2.5	50	0	110	62	137			
1,4-Dichlorobenzene	49.6	2.5	50	0	99	57	142			
4-Isopropyltoluene	47.3	2.5	50	0	95	52	152			
1,2-Dichlorobenzene	51.9	2.5	50	0	104	60	134			
n-Butylbenzene	41.4	2.5	50	0	83	43	158			
1,2-Dibromo-3-chloropropane (DBCP)	240	15	250	0	96	0	419			
1,2,4-Trichlorobenzene	44.6	10	50	0	89	42	161			
Naphthalene	41.9	10	50	0	84	27	178			
Hexachlorobutadiene	84.8	10	100	0	85	0	203			
1,2,3-Trichlorobenzene	40.5	10	50	0	81	34	171			
Surr: 1,2-Dichloroethane-d4	52.5		50		105	72	126			
Surr: Toluene-d8	49.8		50		100	71	128			
Surr: 4-Bromofluorobenzene	52.3		50		105	76	121			

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Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\041119\04111949.D** Batch ID: **MS10W1119C** Analysis Date: **11/20/2004 00:35**

Sample ID: **04111846-04AMSD** Units : **µg/L** Run ID: **MSD_10_041119A** Prep Date: **11/20/2004**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	22.1	2.5	50	0	44	0	193	26.69	19.0(28)	
Chloromethane	34.9	10	50	0	70	25	147	37.63	7.5(31)	
Vinyl chloride	43.4	2.5	50	0	87	34	153	47.41	8.7(23)	
Chloroethane	50.9	2.5	50	0	102	18	172	61.14	18.2(43)	
Bromomethane	38.2	10	50	0	76	0	183	33.89	11.9(54)	
Trichlorofluoromethane	49.5	2.5	50	0	99	32	163	51.78	4.5(25)	
1,1-Dichloroethene	48.1	2.5	50	0	96	51	145	49.63	3.1(23)	
Dichloromethane	44.4	10	50	0	89	47	148	46.26	4.2(40)	
trans-1,2-Dichloroethene	50.7	2.5	50	0	101	59	142	51.61	1.8(28)	
1,1-Dichloroethane	52.8	2.5	50	0	106	58	141	53.39	1.1(25)	
cis-1,2-Dichloroethene	51.9	2.5	50	0	104	51	152	51.21	1.4(34)	
Bromochloromethane	49.7	2.5	50	0	99	58	145	50.73	2.0(22)	
Chloroform	49.2	2.5	50	0	98	61	144	48.96	0.4(22)	
2,2-Dichloropropane	44.2	2.5	50	0	88	22	185	44.6	1.0(31)	
1,2-Dichloroethane	53	2.5	50	0	106	41	151	53.47	0.8(24)	
1,1,1-Trichloroethane	50.7	2.5	50	0	101	55	153	50.15	1.2(22)	
1,1-Dichloropropene	55.4	2.5	50	0	111	62	141	54.94	0.8(22)	
Carbon tetrachloride	50.6	2.5	50	0	101	52	159	50.13	0.8(23)	
Benzene	50.8	1.3	50	0	102	59	145	50.28	1.0(22)	
Dibromomethane	50.1	2.5	50	0	100	55	150	50.8	1.4(39)	
1,2-Dichloropropane	51.2	2.5	50	0	102	56	148	50.09	2.2(22)	
Trichloroethene	51.6	2.5	50	0	103	58	142	50.81	1.5(22)	
Bromodichloromethane	52.9	2.5	50	0	106	54	150	53.12	0.5(23)	
cis-1,3-Dichloropropene	44.7	2.5	50	0	89	54	143	43.99	1.5(24)	
trans-1,3-Dichloropropene	45.2	2.5	50	0	90	51	147	44.38	1.9(25)	
1,1,2-Trichloroethane	51.1	2.5	50	0	102	55	149	50.85	0.4(23)	
Toluene	50.8	1.3	50	0	102	39	161	50.73	0.1(22)	
1,3-Dichloropropane	50.6	2.5	50	0	101	53	143	51.41	1.7(23)	
Dibromochloromethane	48.8	2.5	50	0	98	53	147	49.32	1.1(23)	
1,2-Dibromoethane (EDB)	98.8	10	100	0	99	51	146	100.3	1.5(24)	
Tetrachloroethene	48.4	2.5	50	0	97	56	144	48.13	0.6(23)	
1,1,1,2-Tetrachloroethane	53	2.5	50	0	106	57	147	53.22	0.5(30)	
Chlorobenzene	55.4	2.5	50	0	111	62	138	55.04	0.7(21)	
Ethylbenzene	52.1	1.3	50	0	104	57	145	51.24	1.7(22)	
m,p-Xylene	47.9	1.3	50	0	96	37	163	47.75	0.4(23)	
Bromoform	51.4	2.5	50	0	103	47	146	51.71	0.6(25)	
Styrene	52.4	2.5	50	0	105	46	151	52.07	0.5(33)	
o-Xylene	48.2	1.3	50	0	96	47	156	47.65	1.1(50)	
1,1,2,2-Tetrachloroethane	49.7	2.5	50	0	99	48	162	50.29	1.2(24)	
1,2,3-Trichloropropane	115	10	100	0	115	42	161	116.6	1.3(25)	
Isopropylbenzene	58.1	2.5	50	0	116	48	158	57.91	0.3(23)	
Bromobenzene	59.2	2.5	50	0	118	51	146	58.57	1.1(23)	
n-Propylbenzene	54.7	2.5	50	0	109	53	153	53.92	1.4(35)	
4-Chlorotoluene	54.1	2.5	50	0	108	54	146	53.62	0.8(24)	
2-Chlorotoluene	57.5	2.5	50	0	115	56	145	57.15	0.7(24)	
1,3,5-Trimethylbenzene	51.4	2.5	50	0	103	51	152	50.66	1.5(23)	
tert-Butylbenzene	53.4	2.5	50	0	107	56	154	52.81	1.2(23)	
1,2,4-Trimethylbenzene	47.5	2.5	50	0	95	47	157	47.16	0.7(23)	
sec-Butylbenzene	51.9	2.5	50	0	104	47	154	51.05	1.6(23)	
1,3-Dichlorobenzene	55.1	2.5	50	0	110	62	137	54.82	0.4(22)	
1,4-Dichlorobenzene	50.2	2.5	50	0	100	57	142	49.63	1.2(23)	
4-Isopropyltoluene	48.4	2.5	50	0	97	52	152	47.31	2.3(23)	
1,2-Dichlorobenzene	51.9	2.5	50	0	104	60	134	51.94	0.1(22)	
n-Butylbenzene	42.6	2.5	50	0	85	43	158	41.41	2.9(23)	
1,2-Dibromo-3-chloropropane (DBCP)	242	15	250	0	97	0	419	240	0.8(36)	
1,2,4-Trichlorobenzene	47.5	10	50	0	95	42	161	44.57	6.5(28)	
Naphthalene	46.9	10	50	0	94	27	178	41.89	11.2(33)	
Hexachlorobutadiene	90	10	100	0	90	0	203	84.75	6.0(27)	
1,2,3-Trichlorobenzene	46.5	10	50	0	93	34	171	40.53	13.6(48)	
Surr: 1,2-Dichloroethane-d4	53.7		50		107	72	126			
Surr: Toluene-d8	49.4		50		99	71	128			
Surr: 4-Bromofluorobenzene	51.7		50		103	76	121			

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Date: *02-Dec-04*

QC Summary Report

Work Order: 04111846

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY

Name ALPHA ANALYTICAL
Address 255 GLENDALE AVE, STE 21
SPARKS, NV 89431-5778
Phone (775) 355-1044

Page # 1 of 1

Client Name Battelle Memorial Institute	P.O. # PAY BY CREDIT CRD.	D.O.	
Address 505 King Avenue	PWS #	DWR #	
City, State, Zip Columbus, OH 43201	Phone # 614 424 3779	Fax # 614 424 3667	
Sampled by	Report Attention CHRIS ZIMMERMAN		

DATA REPORT: NEDTS FORMAT ☒ EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other:	Other:	REMARKS
1115	11-17-04	AQ		21503-MW01	3V		✓					✓			
1219	↓	AQ		21503-MW02	3V		✓					✓			
1152	↓	AQ		21503-MW03	3V		✓					✓			
1100	↓	AQ		21503-MW04	3V		✓					✓			
1215	↓	AQ		21503-EB01	3V		✓								
1152	↓	AQ		21503-FB01	3V							✓			
	↓	AQ		21503-TB01											HOLD FOR AUTH.

ADDITIONAL INSTRUCTIONS: Specific VOC Requirements (please specify)

DATA VALIDATION NOT REQUIRED / temp blank included

	Signature	Print Name	Company	Date	Time
Relinquished by	Melody Graves	Melody graves	Battelle	11.17.04	1600
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667

Job : TO44-21503
PO : Credit Card
Client's COC # : none

WorkOrder : BMI04111846

Report Due By : 5:00 PM On : 03-Dec-04

EDD Required : **Yes**
Sampled by : Client
Cooler Temp : 5 °C

18-Nov-04

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	HOLD	TPH/P_W	VOC_W			Sample Remarks
BMI04111846-01A	21503-MW01	AQ	11/17/04 11:15	3	0	10			GAS-C	8260_C/5oxy s			One VOA rcv'd w/air bubble.
BMI04111846-02A	21503-MW02	AQ	11/17/04 12:19	3	0	10			GAS-C	8260_C/5oxy s			
BMI04111846-03A	21503-MW03	AQ	11/17/04 11:52	3	0	10			GAS-C	8260_C/5oxy s			One VOA rcv'd w/air bubble.
BMI04111846-04A	21503-MW04	AQ	11/17/04 11:00	3	0	10			GAS-C	8260_C/5oxy s			
BMI04111846-05A	21503-EB01	AQ	11/17/04 12:15	3	0	10			GAS-C				
BMI04111846-06A	21503-FB01	AQ	11/17/04 11:52	3	0	10				8260_C/5oxy s			
BMI04111846-07A	21503-TB01	AQ	11/17/04 00:00	1	0	10		Hold					TB-client provided.

Comments: Custody seal. Frozen ice. **Data Validation Not Required** Samples should be used as the control spike sample if possible. Needs NEDTS & EDF format. Logged in as per w/o BMI04071244, per Randy. Temp Blank included, provided by client. One VOA each for : samples 21503-MW01 & 21503-MW03 received with air bubbles.

	Signature	Print Name	Company	Date/Time
Received by:	DSBaker	DSBaker	Alpha Analytical, Inc.	11/18/04 1050

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name ALPHA ANALYTICAL
Address 255 GLENDALE AVE, SE21
SPARKS, NV 89431-5778
Phone (775) 355-1044

Page # 1 of 1

Client Name	Battelle Memorial Institute	P.O. # PAY BY CREDIT CARD	D.O.
Address	505 King Avenue	PWS #	DWR #
City, State, Zip	Columbus, OH 43201	Phone # 614 424 3779	Fax # 614 424 3667
		Report Attention CHRIS ZIMMERMAN	

Analyses Required: TPH/E, TPH/P, NO_2, NO_3, SO_4, Pb, Mn^{+2}, Fe^{+2}, TDS, AIK, TOC, VOC* see below, Other:, Other:

DATA REPORT: NEDTS FORMAT ☒ EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Sampled by	Sample Description	Total and type of containers **See below	TPH/E	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other:	Other:	REMARKS
1115	11-17-04	AQ	BMI041118846-01		21503-MW01	3V		✓					✓			
1215	↓	AQ	-02		21503-MW02	3V		✓					✓			
1152	↓	AQ	-03		21503-MW03	3V		✓					✓			
1100	↓	AQ	-04		21503-MW04	3V		✓					✓			
1215	↓	AQ	-05		21503-EB01	3V		✓								
1152	↓	AQ	-06		21503-FB01	3V							✓			
	↓	AQ	-07		21503-TB01											HOLD FOR AUTH.

ADDITIONAL INSTRUCTIONS: Specific VOC Requirements (please specify)

DATA VALIDATION NOT REQUIRED / temp blank included

	Signature	Print Name	Company	Date	Time
Relinquished by	Melody Graves	Melody Graves	Battelle	11.17.04	1600
Received by	DSBaker	DSBaker	Alpha	11/18/04	1050
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

January 2005

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date *11-Feb-05*

Melody Graves
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-7358

CASE NARRATIVE

Project: TO57
Work Order: BMI05012643 **Cooler Temp:** 6 °C

Alpha's Sample ID	Client's Sample ID	Matrix
05012643-01A	21503-QCTB	Aqueous
05012643-02A	21503-QCFB	Aqueous
05012643-03A	21503-QCEB	Aqueous
05012643-04A	21503-MW01	Aqueous
05012643-05A	21503-MW02	Aqueous
05012643-06A	21503-MW03	Aqueous
05012643-07A	21503-MW04	Aqueous
05012643-08A	21503-MW01D	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667
Date Received 01/26/05

Job#: TO57

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**21503-QCEB**						
Lab ID :	BMI05012643-03A	TPH Purgeable	ND		0.050 mg/L	01/25/05	02/01/05
		Surr: 1,2-Dichloroethane-d4	92		%REC	01/25/05	02/01/05
		Surr: Toluene-d8	106		%REC	01/25/05	02/01/05
		Surr: 4-Bromofluorobenzene	103		%REC	01/25/05	02/01/05
Client ID :	**21503-MW01**						
Lab ID :	BMI05012643-04A	TPH Purgeable	12		1.0 mg/L	01/25/05	01/31/05
		Surr: 1,2-Dichloroethane-d4	108		%REC	01/25/05	01/31/05
		Surr: Toluene-d8	98		%REC	01/25/05	01/31/05
		Surr: 4-Bromofluorobenzene	90		%REC	01/25/05	01/31/05
Client ID :	**21503-MW02**						
Lab ID :	BMI05012643-05A	TPH Purgeable	ND	O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	90		%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98		%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	94		%REC	01/25/05	01/28/05
Client ID :	**21503-MW03**						
Lab ID :	BMI05012643-06A	TPH Purgeable	ND	O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	93		%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98		%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	88		%REC	01/25/05	01/28/05
Client ID :	**21503-MW04**						
Lab ID :	BMI05012643-07A	TPH Purgeable	ND	O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	94		%REC	01/25/05	01/28/05
		Surr: Toluene-d8	100		%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	89		%REC	01/25/05	01/28/05
Client ID :	**21503-MW01D**						
Lab ID :	BMI05012643-08A	TPH Purgeable	11		1.0 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	97		%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98		%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	88		%REC	01/25/05	01/28/05

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

O = Reporting Limits were increased due to sample foaming.
ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-04A
Client I.D. Number: 21503-MW01

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/31/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		10	µg/L	36	m,p-Xylene	400	5.0	µg/L
2	Chloromethane	ND		40	µg/L	37	Bromoform	ND	10	µg/L
3	Vinyl chloride	ND		10	µg/L	38	Styrene	ND	10	µg/L
4	Chloroethane	ND		10	µg/L	39	o-Xylene	35	5.0	µg/L
5	Bromomethane	ND		40	µg/L	40	1,1,2,2-Tetrachloroethane	ND	10	µg/L
6	Trichlorofluoromethane	ND		10	µg/L	41	1,2,3-Trichloropropane	ND	40	µg/L
7	1,1-Dichloroethene	ND		10	µg/L	42	Isopropylbenzene	94	10	µg/L
8	Dichloromethane	ND		40	µg/L	43	Bromobenzene	ND	10	µg/L
9	trans-1,2-Dichloroethene	ND		10	µg/L	44	n-Propylbenzene	270	10	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		5.0	µg/L	45	4-Chlorotoluene	ND	10	µg/L
11	1,1-Dichloroethane	ND		10	µg/L	46	2-Chlorotoluene	ND	10	µg/L
12	cis-1,2-Dichloroethene	ND		10	µg/L	47	1,3,5-Trimethylbenzene	190	10	µg/L
13	Bromochloromethane	ND		10	µg/L	48	tert-Butylbenzene	ND	10	µg/L
14	Chloroform	ND		10	µg/L	49	1,2,4-Trimethylbenzene	730	10	µg/L
15	2,2-Dichloropropane	ND		10	µg/L	50	sec-Butylbenzene	27	10	µg/L
16	1,2-Dichloroethane	ND		10	µg/L	51	1,3-Dichlorobenzene	ND	10	µg/L
17	1,1,1-Trichloroethane	ND		10	µg/L	52	1,4-Dichlorobenzene	ND	10	µg/L
18	1,1-Dichloropropene	ND		10	µg/L	53	4-Isopropyltoluene	ND	10	µg/L
19	Carbon tetrachloride	ND		10	µg/L	54	1,2-Dichlorobenzene	ND	10	µg/L
20	Benzene	ND	*	5.0	µg/L	55	n-Butylbenzene	32	10	µg/L
21	Dibromomethane	ND		10	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	60	µg/L
22	1,2-Dichloropropane	ND		10	µg/L	57	1,2,4-Trichlorobenzene	ND	40	µg/L
23	Trichloroethene	ND		10	µg/L	58	Naphthalene	530	40	µg/L
24	Bromodichloromethane	ND		10	µg/L	59	Hexachlorobutadiene	ND	40	µg/L
25	cis-1,3-Dichloropropene	ND		10	µg/L	60	1,2,3-Trichlorobenzene	ND	40	µg/L
26	trans-1,3-Dichloropropene	ND		10	µg/L	61	Surr: 1,2-Dichloroethane-d4	108		%REC
27	1,1,2-Trichloroethane	ND		10	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND		5.0	µg/L	63	Surr: 4-Bromofluorobenzene	90		%REC
29	1,3-Dichloropropane	ND		10	µg/L					
30	Dibromochloromethane	ND		10	µg/L					
31	1,2-Dibromoethane (EDB)	ND		40	µg/L					
32	Tetrachloroethene	ND		10	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		10	µg/L					
34	Chlorobenzene	ND		10	µg/L					
35	Ethylbenzene	960		5.0	µg/L					

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 2.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-08A
Client I.D. Number: 21503-MW01D

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	10	µg/L
2	Chloromethane	ND	40	µg/L
3	Vinyl chloride	ND	10	µg/L
4	Chloroethane	ND	10	µg/L
5	Bromomethane	ND	40	µg/L
6	Trichlorofluoromethane	ND	10	µg/L
7	1,1-Dichloroethene	ND	10	µg/L
8	Dichloromethane	ND	40	µg/L
9	trans-1,2-Dichloroethene	ND	10	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	10	µg/L
12	cis-1,2-Dichloroethene	ND	10	µg/L
13	Bromochloromethane	ND	10	µg/L
14	Chloroform	ND	10	µg/L
15	2,2-Dichloropropane	ND	10	µg/L
16	1,2-Dichloroethane	ND	10	µg/L
17	1,1,1-Trichloroethane	ND	10	µg/L
18	1,1-Dichloropropene	ND	10	µg/L
19	Carbon tetrachloride	ND	10	µg/L
20	Benzene	ND *	5.0	µg/L
21	Dibromomethane	ND	10	µg/L
22	1,2-Dichloropropane	ND	10	µg/L
23	Trichloroethene	ND	10	µg/L
24	Bromodichloromethane	ND	10	µg/L
25	cis-1,3-Dichloropropene	ND	10	µg/L
26	trans-1,3-Dichloropropene	ND	10	µg/L
27	1,1,2-Trichloroethane	ND	10	µg/L
28	Toluene	ND	5.0	µg/L
29	1,3-Dichloropropane	ND	10	µg/L
30	Dibromochloromethane	ND	10	µg/L
31	1,2-Dibromoethane (EDB)	ND	40	µg/L
32	Tetrachloroethene	ND	10	µg/L
33	1,1,1,2-Tetrachloroethane	ND	10	µg/L
34	Chlorobenzene	ND	10	µg/L
35	Ethylbenzene	1,000	5.0	µg/L
36	m,p-Xylene	400	5.0	µg/L
37	Bromoform	ND	10	µg/L
38	Styrene	ND	10	µg/L
39	o-Xylene	32	5.0	µg/L
40	1,1,2,2-Tetrachloroethane	ND	10	µg/L
41	1,2,3-Trichloropropane	ND	40	µg/L
42	Isopropylbenzene	93	10	µg/L
43	Bromobenzene	ND	10	µg/L
44	n-Propylbenzene	280	10	µg/L
45	4-Chlorotoluene	ND	10	µg/L
46	2-Chlorotoluene	ND	10	µg/L
47	1,3,5-Trimethylbenzene	170	10	µg/L
48	tert-Butylbenzene	ND	10	µg/L
49	1,2,4-Trimethylbenzene	680	10	µg/L
50	sec-Butylbenzene	26	10	µg/L
51	1,3-Dichlorobenzene	ND	10	µg/L
52	1,4-Dichlorobenzene	ND	10	µg/L
53	4-Isopropyltoluene	ND	10	µg/L
54	1,2-Dichlorobenzene	ND	10	µg/L
55	n-Butylbenzene	33	10	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	60	µg/L
57	1,2,4-Trichlorobenzene	ND	40	µg/L
58	Naphthalene	570	40	µg/L
59	Hexachlorobutadiene	ND	40	µg/L
60	1,2,3-Trichlorobenzene	ND	40	µg/L
61	Surr: 1,2-Dichloroethane-d4	97		%REC
62	Surr: Toluene-d8	98		%REC
63	Surr: 4-Bromofluorobenzene	88		%REC

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 2.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-05A
Client I.D. Number: 21503-MW02

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L
2	Chloromethane	ND		4.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L
5	Bromomethane	ND		4.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L
20	Benzene	ND	*	0.50	µg/L
21	Dibromomethane	ND		1.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L
23	Trichloroethene	ND		1.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L
27	1,1,2-Trichloroethane	ND		1.0	µg/L
28	Toluene	ND		0.50	µg/L
29	1,3-Dichloropropane	ND		1.0	µg/L
30	Dibromochloromethane	ND		1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L
32	Tetrachloroethene	ND		1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L
34	Chlorobenzene	ND		1.0	µg/L
35	Ethylbenzene	ND		0.50	µg/L
36	m,p-Xylene	ND		0.50	µg/L
37	Bromoform	ND		1.0	µg/L
38	Styrene	ND		1.0	µg/L
39	o-Xylene	ND		0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
41	1,2,3-Trichloropropane	ND		4.0	µg/L
42	Isopropylbenzene	ND		1.0	µg/L
43	Bromobenzene	ND		1.0	µg/L
44	n-Propylbenzene	ND		1.0	µg/L
45	4-Chlorotoluene	ND		1.0	µg/L
46	2-Chlorotoluene	ND		1.0	µg/L
47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
48	tert-Butylbenzene	ND		1.0	µg/L
49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
50	sec-Butylbenzene	ND		1.0	µg/L
51	1,3-Dichlorobenzene	ND		1.0	µg/L
52	1,4-Dichlorobenzene	ND		1.0	µg/L
53	4-Isopropyltoluene	ND		1.0	µg/L
54	1,2-Dichlorobenzene	ND		1.0	µg/L
55	n-Butylbenzene	ND		1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND		6.0	µg/L
57	1,2,4-Trichlorobenzene	ND		4.0	µg/L
58	Naphthalene	ND		4.0	µg/L
59	Hexachlorobutadiene	ND		4.0	µg/L
60	1,2,3-Trichlorobenzene	ND		4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	90			%REC
62	Surr: Toluene-d8	98			%REC
63	Surr: 4-Bromofluorobenzene	94			%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-06A
Client I.D. Number: 21503-MW03

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L
2	Chloromethane	ND		4.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L
5	Bromomethane	ND		4.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L
20	Benzene	ND	*	0.50	µg/L
21	Dibromomethane	ND		1.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L
23	Trichloroethene	ND		1.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L
27	1,1,2-Trichloroethane	ND		1.0	µg/L
28	Toluene	ND		0.50	µg/L
29	1,3-Dichloropropane	ND		1.0	µg/L
30	Dibromochloromethane	ND		1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L
32	Tetrachloroethene	ND		1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L
34	Chlorobenzene	ND		1.0	µg/L
35	Ethylbenzene	ND		0.50	µg/L
36	m,p-Xylene	ND		0.50	µg/L
37	Bromoform	ND		1.0	µg/L
38	Styrene	ND		1.0	µg/L
39	o-Xylene	ND		0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
41	1,2,3-Trichloropropane	ND		4.0	µg/L
42	Isopropylbenzene	ND		1.0	µg/L
43	Bromobenzene	ND		1.0	µg/L
44	n-Propylbenzene	ND		1.0	µg/L
45	4-Chlorotoluene	ND		1.0	µg/L
46	2-Chlorotoluene	ND		1.0	µg/L
47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
48	tert-Butylbenzene	ND		1.0	µg/L
49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
50	sec-Butylbenzene	ND		1.0	µg/L
51	1,3-Dichlorobenzene	ND		1.0	µg/L
52	1,4-Dichlorobenzene	ND		1.0	µg/L
53	4-Isopropyltoluene	ND		1.0	µg/L
54	1,2-Dichlorobenzene	ND		1.0	µg/L
55	n-Butylbenzene	ND		1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND		6.0	µg/L
57	1,2,4-Trichlorobenzene	ND		4.0	µg/L
58	Naphthalene	ND		4.0	µg/L
59	Hexachlorobutadiene	ND		4.0	µg/L
60	1,2,3-Trichlorobenzene	ND		4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	93			%REC
62	Surr: Toluene-d8	98			%REC
63	Surr: 4-Bromofluorobenzene	88			%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-07A
Client I.D. Number: 21503-MW04

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L
2	Chloromethane	ND		4.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L
5	Bromomethane	ND		4.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L
20	Benzene	ND	*	0.50	µg/L
21	Dibromomethane	ND		1.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L
23	Trichloroethene	ND		1.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L
27	1,1,2-Trichloroethane	ND		1.0	µg/L
28	Toluene	ND		0.50	µg/L
29	1,3-Dichloropropane	ND		1.0	µg/L
30	Dibromochloromethane	ND		1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L
32	Tetrachloroethene	ND		1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L
34	Chlorobenzene	ND		1.0	µg/L
35	Ethylbenzene	ND		0.50	µg/L
36	m,p-Xylene	ND		0.50	µg/L
37	Bromoform	ND		1.0	µg/L
38	Styrene	ND		1.0	µg/L
39	o-Xylene	ND		0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
41	1,2,3-Trichloropropane	ND		4.0	µg/L
42	Isopropylbenzene	ND		1.0	µg/L
43	Bromobenzene	ND		1.0	µg/L
44	n-Propylbenzene	ND		1.0	µg/L
45	4-Chlorotoluene	ND		1.0	µg/L
46	2-Chlorotoluene	ND		1.0	µg/L
47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
48	tert-Butylbenzene	ND		1.0	µg/L
49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
50	sec-Butylbenzene	ND		1.0	µg/L
51	1,3-Dichlorobenzene	ND		1.0	µg/L
52	1,4-Dichlorobenzene	ND		1.0	µg/L
53	4-Isopropyltoluene	ND		1.0	µg/L
54	1,2-Dichlorobenzene	ND		1.0	µg/L
55	n-Butylbenzene	ND		1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND		6.0	µg/L
57	1,2,4-Trichlorobenzene	ND		4.0	µg/L
58	Naphthalene	ND		4.0	µg/L
59	Hexachlorobutadiene	ND		4.0	µg/L
60	1,2,3-Trichlorobenzene	ND		4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	94			%REC
62	Surr: Toluene-d8	100			%REC
63	Surr: 4-Bromofluorobenzene	89			%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-01A
Client I.D. Number: 21503-QCTB

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND		2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	*	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	99		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	100		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	102		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		2.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-02A
Client I.D. Number: 21503-QCFB

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L
2	Chloromethane	ND		2.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L
5	Bromomethane	ND		2.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L
8	Dichloromethane	ND		2.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L
20	Benzene	ND	*	0.50	µg/L
21	Dibromomethane	ND		1.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L
23	Trichloroethene	ND		1.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L
27	1,1,2-Trichloroethane	ND		1.0	µg/L
28	Toluene	ND		0.50	µg/L
29	1,3-Dichloropropane	ND		1.0	µg/L
30	Dibromochloromethane	ND		1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND		2.0	µg/L
32	Tetrachloroethene	ND		1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L
34	Chlorobenzene	ND		1.0	µg/L
35	Ethylbenzene	ND		0.50	µg/L

	Compound	Concentration	Reporting Limit	
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	99		%REC
62	Surr: Toluene-d8	102		%REC
63	Surr: 4-Bromofluorobenzene	98		%REC

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC pH Report

Work Order BMI05012643 **Project:** TO57

Alpha's Sample ID	Client's Sample ID	Matrix	pH
05012643-01A	21503-QCTB	Aqueous	
05012643-02A	21503-QCFB	Aqueous	2
05012643-03A	21503-QCEB	Aqueous	2
05012643-04A	21503-MW01	Aqueous	2
05012643-05A	21503-MW02	Aqueous	2
05012643-06A	21503-MW03	Aqueous	2
05012643-07A	21503-MW04	Aqueous	2
05012643-08A	21503-MW01D	Aqueous	2

2/9/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Feb-05*

QC Summary Report

Work Order: 05012643

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012805.D** Batch ID: **MS10W0128B** Analysis Date: **01/28/2005 09:15**

Sample ID: **MBLK MS10W0128B** Units : **mg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0103		0.01		103	76	128			
Surr: Toluene-d8	0.00961		0.01		96	84	113			
Surr: 4-Bromofluorobenzene	0.00993		0.01		99	79	119			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012803.D** Batch ID: **MS10W0128B** Analysis Date: **01/28/2005 08:33**

Sample ID: **GLCS MS10W0128B** Units : **mg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	0.404	0.05	0.4		101	78	127			
Surr: 1,2-Dichloroethane-d4	0.0087		0.01		87	76	128			
Surr: Toluene-d8	0.0101		0.01		101	84	113			
Surr: 4-Bromofluorobenzene	0.00949		0.01		95	79	119			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012809.D** Batch ID: **MS10W0128B** Analysis Date: **01/28/2005 10:54**

Sample ID: **05012644-01AGS** Units : **mg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.35	0.25	2	0.1327	111	70	139			
Surr: 1,2-Dichloroethane-d4	0.0492		0.05		98	76	128			
Surr: Toluene-d8	0.0496		0.05		99	84	113			
Surr: 4-Bromofluorobenzene	0.0479		0.05		96	79	119			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012810.D** Batch ID: **MS10W0128B** Analysis Date: **01/28/2005 11:15**

Sample ID: **05012644-01AGSD** Units : **mg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.47	0.25	2	0.1327	117	70	139	2.351	5.1(12)	
Surr: 1,2-Dichloroethane-d4	0.0509		0.05		102	76	128			
Surr: Toluene-d8	0.0485		0.05		97	84	113			
Surr: 4-Bromofluorobenzene	0.0505		0.05		101	79	119			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Feb-05*

QC Summary Report

Work Order: 05012643

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012805.D** Batch ID: **MS10W0128A** Analysis Date: **01/28/2005 09:15**

Sample ID: **MBLK MS10W0128A** Units : **µg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	5								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								
Surr: 1,2-Dichloroethane-d4	10.3		10		103	76	127			
Surr: Toluene-d8	9.61		10		96	84	113			
Surr: 4-Bromofluorobenzene	9.93		10		99	79	119			

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QC Summary Report

Work Order: 05012643

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012804.D** Batch ID: **MS10W0128A** Analysis Date: **01/28/2005 08:54**

Sample ID: **LCS MS10W0128A** Units : **µg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	6.34	1	10		63	32	129			
Chloromethane	7.25	2	10		73	44	121			
Vinyl chloride	11.9	1	10		119	80	120			
Chloroethane	14.2	1	10		142	52	142			
Bromomethane	10.1	2	10		101	5	151			
Trichlorofluoromethane	12.2	1	10		122	70	141			
1,1-Dichloroethene	11.4	1	10		114	80	120			
Dichloromethane	10.5	2	10		105	73	117			
trans-1,2-Dichloroethene	11.5	1	10		115	74	129			
1,1-Dichloroethane	10.8	1	10		108	78	125			
cis-1,2-Dichloroethene	11.5	1	10		115	79	126			
Bromochloromethane	10.7	1	10		107	76	126			
Chloroform	10.8	1	10		108	80	120			
2,2-Dichloropropane	12.1	1	10		121	71	156			
1,2-Dichloroethane	10.6	1	10		106	72	135			
1,1,1-Trichloroethane	11.2	1	10		112	74	132			
1,1-Dichloropropene	11.2	1	10		112	83	129			
Carbon tetrachloride	11	1	10		110	68	137			
Benzene	9.44	0.5	10		94	81	122			
Dibromomethane	10.2	1	10		102	75	127			
1,2-Dichloropropane	10.3	1	10		103	80	120			
Trichloroethene	9.89	1	10		99	74	125			
Bromodichloromethane	11.1	1	10		111	75	130			
cis-1,3-Dichloropropene	10.2	1	10		102	78	128			
trans-1,3-Dichloropropene	10.8	1	10		108	74	134			
1,1,2-Trichloroethane	10.1	1	10		101	75	129			
Toluene	9.97	0.5	10		99.7	80	120			
1,3-Dichloropropane	10.6	1	10		106	73	129			
Dibromochloromethane	10.9	1	10		109	71	130			
1,2-Dibromoethane (EDB)	22	2	20		110	75	132			
Tetrachloroethene	10.1	1	10		101	73	131			
1,1,1,2-Tetrachloroethane	10.3	1	10		103	78	125			
Chlorobenzene	10.4	1	10		104	79	124			
Ethylbenzene	10.8	0.5	10		108	80	120			
m,p-Xylene	10.2	0.5	10		102	80	129			
Bromoform	10.6	1	10		106	66	138			
Styrene	9.81	1	10		98	79	130			
o-Xylene	10.2	0.5	10		102	80	129			
1,1,2,2-Tetrachloroethane	9.65	1	10		97	63	142			
1,2,3-Trichloropropane	20.1	2	20		100	73	132			
Isopropylbenzene	10.3	1	10		103	78	133			
Bromobenzene	9.53	1	10		95	76	127			
n-Propylbenzene	9.84	1	10		98	78	130			
4-Chlorotoluene	10.3	1	10		103	80	129			
2-Chlorotoluene	10.2	1	10		102	79	129			
1,3,5-Trimethylbenzene	10.5	1	10		105	77	134			
tert-Butylbenzene	10	1	10		100	80	129			
1,2,4-Trimethylbenzene	10.2	1	10		102	77	133			
sec-Butylbenzene	10.2	1	10		102	79	129			
1,3-Dichlorobenzene	10.5	1	10		105	80	125			
1,4-Dichlorobenzene	10.3	1	10		103	79	125			
4-Isopropyltoluene	9.86	1	10		99	77	133			
1,2-Dichlorobenzene	9.54	1	10		95	79	119			
n-Butylbenzene	9.21	1	10		92	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	49.9	3	50		99.7	61	138			
1,2,4-Trichlorobenzene	8.95	2	10		90	55	139			
Naphthalene	9.04	2	10		90	35	150			
Hexachlorobutadiene	19.7	2	20		98	65	135			
1,2,3-Trichlorobenzene	7.73	2	10		77	39	147			
Surr: 1,2-Dichloroethane-d4	9.54		10		95	76	127			
Surr: Toluene-d8	10.6		10		106	84	113			
Surr: 4-Bromofluorobenzene	9.86		10		99	79	119			

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Date: *11-Feb-05*

QC Summary Report

Work Order: 05012643

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012807.D** Batch ID: **MS10W0128A** Analysis Date: **01/28/2005 10:12**

Sample ID: **05012644-01AMS** Units : **µg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	37.5	2.5	50	0	75	17	130			
Chloromethane	40.8	10	50	0	82	31	127			
Vinyl chloride	62.3	2.5	50	0	125	52	131			
Chloroethane	109	2.5	50	0	218	40	146			M1
Bromomethane	40.9	10	50	0	82	4	152			
Trichlorofluoromethane	60.9	2.5	50	0	122	57	143			
1,1-Dichloroethene	50	2.5	50	0	100	65	127			
Dichloromethane	46.5	10	50	0	93	68	119			
trans-1,2-Dichloroethene	53.8	2.5	50	0	108	67	131			
1,1-Dichloroethane	51.3	2.5	50	0	103	71	128			
cis-1,2-Dichloroethene	54.9	2.5	50	0	110	73	129			
Bromochloromethane	52.4	2.5	50	0	105	71	130			
Chloroform	52.1	2.5	50	0	104	71	124			
2,2-Dichloropropane	57.3	2.5	50	0	115	52	157			
1,2-Dichloroethane	50.7	2.5	50	0	101	68	139			
1,1,1-Trichloroethane	52.2	2.5	50	0	104	67	134			
1,1-Dichloropropene	54.1	2.5	50	0	108	75	130			
Carbon tetrachloride	52.3	2.5	50	0	105	62	137			
Benzene	46.9	1.3	50	0	94	74	125			
Dibromomethane	52.5	2.5	50	0	105	73	130			
1,2-Dichloropropane	50	2.5	50	0	100	72	130			
Trichloroethene	48.5	2.5	50	0	97	66	126			
Bromodichloromethane	55.4	2.5	50	0	111	70	133			
cis-1,3-Dichloropropene	46.9	2.5	50	0	94	61	130			
trans-1,3-Dichloropropene	49.6	2.5	50	0	99	67	134			
1,1,2-Trichloroethane	49.5	2.5	50	0	99	72	132			
Toluene	49.1	1.3	50	0	98	76	120			
1,3-Dichloropropane	51.5	2.5	50	0	103	73	129			
Dibromochloromethane	51.1	2.5	50	0	102	70	130			
1,2-Dibromoethane (EDB)	108	10	100	0	108	75	133			
Tetrachloroethene	46.7	2.5	50	0	93	66	131			
1,1,1,2-Tetrachloroethane	50.1	2.5	50	0	100	76	126			
Chlorobenzene	50.7	2.5	50	0	101	76	124			
Ethylbenzene	53.6	1.3	50	1.29	105	77	124			
m,p-Xylene	48.6	1.3	50	0	97	73	130			
Bromoform	53.2	2.5	50	0	106	66	140			
Styrene	48.4	2.5	50	0	97	73	131			
o-Xylene	49	1.3	50	0.65	97	74	131			
1,1,2,2-Tetrachloroethane	47.6	2.5	50	0	95	63	146			
1,2,3-Trichloropropane	101	10	100	0	101	73	136			
Isopropylbenzene	49.6	2.5	50	0	99	73	133			
Bromobenzene	46.3	2.5	50	0	93	75	127			
n-Propylbenzene	48.1	2.5	50	0	96	73	130			
4-Chlorotoluene	48.7	2.5	50	0	97	76	129			
2-Chlorotoluene	47.9	2.5	50	0	96	76	129			
1,3,5-Trimethylbenzene	50.3	2.5	50	0	101	70	135			
tert-Butylbenzene	48.2	2.5	50	0	96	74	129			
1,2,4-Trimethylbenzene	49.2	2.5	50	1.04	96	70	134			
sec-Butylbenzene	49.5	2.5	50	0	99	74	129			
1,3-Dichlorobenzene	49.3	2.5	50	0	99	77	125			
1,4-Dichlorobenzene	48	2.5	50	0	96	76	126			
4-Isopropyltoluene	47.4	2.5	50	0	95	71	133			
1,2-Dichlorobenzene	45.4	2.5	50	0	91	77	120			
n-Butylbenzene	44.7	2.5	50	1.7	86	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	242	15	250	0	97	61	142			
1,2,4-Trichlorobenzene	42.3	10	50	0	85	54	143			
Naphthalene	46.7	10	50	0	93	35	159			
Hexachlorobutadiene	93.8	10	100	0	94	60	136			
1,2,3-Trichlorobenzene	42.9	10	50	0	86	38	154			
Surr: 1,2-Dichloroethane-d4	46.7		50		93	76	127			
Surr: Toluene-d8	52.5		50		105	84	113			
Surr: 4-Bromofluorobenzene	49.4		50		99	79	119			

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Date: *11-Feb-05*

QC Summary Report

Work Order: 05012643

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050128\05012808.D** Batch ID: **MS10W0128A** Analysis Date: **01/28/2005 10:33**

Sample ID: **05012644-01AMSD** Units : **µg/L** Run ID: **MSD_10_050128A** Prep Date: **01/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	40.6	2.5	50	0	81	17	130	37.46	8.0(16)	
Chloromethane	41.4	10	50	0	83	31	127	40.76	1.6(20)	
Vinyl chloride	63.7	2.5	50	0	127	52	131	62.31	2.2(16)	
Chloroethane	118	2.5	50	0	235	40	146	109	7.6(40)	M1
Bromomethane	46.9	10	50	0	94	4	152	40.87	13.7(32)	
Trichlorofluoromethane	64.9	2.5	50	0	130	57	143	60.92	6.3(22)	
1,1-Dichloroethene	52.8	2.5	50	0	106	65	127	50.04	5.4(17)	
Dichloromethane	49.1	10	50	0	98	68	119	46.53	5.4(15)	
trans-1,2-Dichloroethene	57.2	2.5	50	0	114	67	131	53.77	6.2(30)	
1,1-Dichloroethane	52.3	2.5	50	0	105	71	128	51.32	1.8(14)	
cis-1,2-Dichloroethene	56.3	2.5	50	0	113	73	129	54.94	2.5(23)	
Bromochloromethane	55.2	2.5	50	0	110	71	130	52.35	5.3(15)	
Chloroform	53.7	2.5	50	0	107	71	124	52.07	3.1(13)	
2,2-Dichloropropane	60.3	2.5	50	0	121	52	157	57.28	5.1(14)	
1,2-Dichloroethane	53.9	2.5	50	0	108	68	139	50.72	6.0(14)	
1,1,1-Trichloroethane	55.4	2.5	50	0	111	67	134	52.2	5.9(14)	
1,1-Dichloropropene	54.6	2.5	50	0	109	75	130	54.14	0.8(14)	
Carbon tetrachloride	55.6	2.5	50	0	111	62	137	52.32	6.1(15)	
Benzene	47.9	1.3	50	0	96	74	124	46.94	2.0(13)	
Dibromomethane	53.2	2.5	50	0	106	73	130	52.47	1.4(15)	
1,2-Dichloropropane	52.5	2.5	50	0	105	72	130	50.02	4.9(13)	
Trichloroethene	47.4	2.5	50	0	95	66	126	48.52	2.3(13)	
Bromodichloromethane	57.2	2.5	50	0	114	70	133	55.44	3.2(14)	
cis-1,3-Dichloropropene	47.5	2.5	50	0	95	61	130	46.89	1.2(15)	
trans-1,3-Dichloropropene	50.7	2.5	50	0	101	67	134	49.64	2.2(16)	
1,1,2-Trichloroethane	49.4	2.5	50	0	99	72	132	49.52	0.3(16)	
Toluene	47.5	1.3	50	0	95	76	119	49.11	3.3(13)	
1,3-Dichloropropane	50.9	2.5	50	0	102	73	129	51.51	1.2(15)	
Dibromochloromethane	52	2.5	50	0	104	70	130	51.11	1.8(15)	
1,2-Dibromoethane (EDB)	104	10	100	0	104	75	133	108.2	3.6(15)	
Tetrachloroethene	46.2	2.5	50	0	92	66	131	46.67	1.1(14)	
1,1,1,2-Tetrachloroethane	48.9	2.5	50	0	98	76	126	50.1	2.5(13)	
Chlorobenzene	50.1	2.5	50	0	100	76	120	50.66	1.0(12)	
Ethylbenzene	51.8	1.3	50	1.29	101	77	124	53.62	3.5(13)	
m,p-Xylene	48.4	1.3	50	0	97	73	130	48.58	0.5(14)	
Bromoform	52.9	2.5	50	0	106	66	140	53.22	0.6(16)	
Styrene	46.4	2.5	50	0	93	73	131	48.37	4.2(13)	
o-Xylene	48.1	1.3	50	0.65	95	74	131	48.98	1.8(13)	
1,1,2,2-Tetrachloroethane	45.8	2.5	50	0	92	63	146	47.59	3.9(17)	
1,2,3-Trichloropropane	98	10	100	0	98	73	136	100.5	2.5(19)	
Isopropylbenzene	48	2.5	50	0	96	73	133	49.64	3.4(15)	
Bromobenzene	45.4	2.5	50	0	91	75	127	46.3	2.0(18)	
n-Propylbenzene	47.5	2.5	50	0	95	73	130	48.14	1.4(14)	
4-Chlorotoluene	48.7	2.5	50	0	97	76	129	48.66	0.0(13)	
2-Chlorotoluene	48.5	2.5	50	0	97	76	129	47.87	1.3(13)	
1,3,5-Trimethylbenzene	48.9	2.5	50	0	98	70	135	50.3	2.8(14)	
tert-Butylbenzene	47.9	2.5	50	0	96	74	129	48.19	0.6(14)	
1,2,4-Trimethylbenzene	48.9	2.5	50	1.04	96	70	134	49.23	0.6(14)	
sec-Butylbenzene	50.2	2.5	50	0	100	74	129	49.54	1.4(14)	
1,3-Dichlorobenzene	49.7	2.5	50	0	99	77	125	49.26	0.8(12)	
1,4-Dichlorobenzene	48.6	2.5	50	0	97	76	126	47.99	1.3(12)	
4-Isopropyltoluene	47.7	2.5	50	0	95	71	133	47.43	0.6(15)	
1,2-Dichlorobenzene	45.7	2.5	50	0	91	77	120	45.41	0.6(12)	
n-Butylbenzene	45.4	2.5	50	1.7	87	63	138	44.73	1.4(15)	
1,2-Dibromo-3-chloropropane (DBCP)	257	15	250	0	103	61	142	242	6.0(17)	
1,2,4-Trichlorobenzene	47.9	10	50	0	96	54	143	42.32	12.4(21)	
Naphthalene	54.5	10	50	0	109	35	159	46.67	15.4(28)	
Hexachlorobutadiene	100	10	100	0	100	60	136	93.79	6.9(17)	
1,2,3-Trichlorobenzene	52.2	10	50	0	104	38	154	42.85	19.7(33)	
Surr: 1,2-Dichloroethane-d4	48.5		50		97	76	127			
Surr: Toluene-d8	50.4		50		101	84	113			
Surr: 4-Bromofluorobenzene	49.1		50		98	79	119			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Feb-05*

QC Summary Report

Work Order: 05012643

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name ALPHA ANALYTICAL
Address 255 Glendale AVE Suite 21
SPARKS, NV 89431
Phone 775 355 1044

Page # _____ of _____

Client Name **Battelle Memorial Institute**	P.O. # 180803	D.O. 57	
Address **505 King Avenue**	PWS #	DWR #	
City, State, Zip **Columbus, OH 43201**	Phone # 614 4245922	Fax # 614 424 3667	
Sampled by MW/GH	Report Attention Melody GRAVES		

Analyses Required

DATA REPORT: NEDTS FORMAT ☒ EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	TPH/P GAS	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other:	Other:	REMARKS
25	JAN	AQ	BM105012643-01	21503-~~FB~~ GH QCTB	1V							X			
0920	1-25	AQ	02	21503-QC FB	3V							X			
0925	1-25	AQ	03	21503-QCEB	3V		X					~~X~~ GH			TPH GAS ONLY
1040	1-25	AQ	04	21503-MW01	6V		X					X			
0950	1-25	AQ	05	21503-MW02	6V		X					X			
1002	1-25	AQ	06	21503-MW03	6V		X					X			
1045	1-25	AQ	07	21503-MW04	6V		X					X			
1040	1-25	AQ	08	21503-MW01D	6V		X					X			

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** see attached VOC list.

Data validation Required FOR 21503-MW04 Reports submitted on CD-Rom.

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	GREG HEADINGTON	Battelle	25 JAN 05	1230
Received by	Laura Long	Laura Long	Alpha	1/26/05	1045
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMI05012643

Report Due By : 5:00 PM On : 09-Feb-05

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Melody Graves
TEL : (614) 424-5922
FAX : (614) 424-3667
EMail gravesmj@battelle.org

EDD Required : **Yes** PDF Required : **No**

Sampled by : MW/GH

Report Attention : Melody Graves
CC Report :

Job : TO57
PO : 180803

Client's COC # : none

Cooler Temp : 6 °C

26-Jan-05

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	TPH/P_W	VOC_W	Requested Tests			Sample Remarks
BMI05012643-01A	21503-QCTB	AQ	01/25/05 00:00	1	0	10			8260_C/MTB E				Rend TB 12/20/04.
BMI05012643-02A	21503-QCFB	AQ	01/25/05 09:20	3	0	10			8260_C/MTB E				~~Rend TB 12/20/04.~~
BMI05012643-03A	21503-QCEB	AQ	01/25/05 09:25	3	0	10		GAS-C					
BMI05012643-04A	21503-MW01	AQ	01/25/05 10:40	6	0	10		GAS-C	8260_C/MTB E				
BMI05012643-05A	21503-MW02	AQ	01/25/05 09:50	6	0	10		GAS-C	8260_C/MTB E				
BMI05012643-06A	21503-MW03	AQ	01/25/05 10:02	6	0	10		GAS-C	8260_C/MTB E				
BMI05012643-07A	21503-MW04	AQ	01/25/05 10:45	6	0	10		GAS-C	8260_C/MTB E				MS/MSD
BMI05012643-08A	21503-MW01D	AQ	01/25/05 10:40	6	0	10		GAS-C	8260_C/MTB E				

Comments: Frozen ice. No security seals. Level IV QC. Data validation required for 21503-MW04. Reports submitted on CD-ROM. Report J-values for Benzene down to 0.25 ug/L. :

	Signature	Print Name	Company	Date/Time
Received by:	Laura Long	laura long	Alpha Analytical, Inc.	1/26/05 1045

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

April 2005

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *06-May-05*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-7358

CASE NARRATIVE

Project: DO102
Work Order: BMI05042126 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
05042126-01A	21503-QCTB	Aqueous
05042126-02A	21503-QCFB	Aqueous
05042126-03A	21503-QCEB	Aqueous
05042126-04A	21503-MW01	Aqueous
05042126-05A	21503-MW01D	Aqueous
05042126-06A	21503-MW02	Aqueous
05042126-07A	21503-MW03	Aqueous
05042126-08A	21503-MW04	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 04/21/05

Job#: DO102

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**21503-QCEB**						
Lab ID :	BMI05042126-03A	TPH Purgeable	ND		0.050 mg/L	04/19/05	04/26/05
		Surr: 1,2-Dichloroethane-d4	111		%REC	04/19/05	04/26/05
		Surr: Toluene-d8	99		%REC	04/19/05	04/26/05
		Surr: 4-Bromofluorobenzene	111		%REC	04/19/05	04/26/05
Client ID :	**21503-MW01**						
Lab ID :	BMI05042126-04A	TPH Purgeable	4.1		0.50 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	105		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	92		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	100		%REC	04/19/05	04/25/05
Client ID :	**21503-MW01D**						
Lab ID :	BMI05042126-05A	TPH Purgeable	4.0		0.50 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	106		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	95		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	101		%REC	04/19/05	04/25/05
Client ID :	**21503-MW02**						
Lab ID :	BMI05042126-06A	TPH Purgeable	ND	O	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	106		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	93		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	116		%REC	04/19/05	04/25/05
Client ID :	**21503-MW03**						
Lab ID :	BMI05042126-07A	TPH Purgeable	ND	O	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	111		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	99		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	113		%REC	04/19/05	04/25/05
Client ID :	**21503-MW04**						
Lab ID :	BMI05042126-08A	TPH Purgeable	ND	O	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	112		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	98		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	111		%REC	04/19/05	04/25/05

Alpha Analytical, Inc.

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O = Reporting Limits were increased due to sample foaming.
ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-04A
Client I.D. Number: 21503-MW01

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	5.0	µg/L	36	m,p-Xylene	86	2.5	µg/L
2	Chloromethane	ND	20	µg/L	37	Bromoform	ND	5.0	µg/L
3	Vinyl chloride	ND	5.0	µg/L	38	Styrene	ND	5.0	µg/L
4	Chloroethane	ND	5.0	µg/L	39	o-Xylene	5.4	2.5	µg/L
5	Bromomethane	ND	20	µg/L	40	1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
6	Trichlorofluoromethane	ND	5.0	µg/L	41	1,2,3-Trichloropropane	ND	20	µg/L
7	1,1-Dichloroethene	ND	5.0	µg/L	42	Isopropylbenzene	42	5.0	µg/L
8	Dichloromethane	ND	20	µg/L	43	Bromobenzene	ND	5.0	µg/L
9	trans-1,2-Dichloroethene	ND	5.0	µg/L	44	n-Propylbenzene	120	5.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	2.5	µg/L	45	4-Chlorotoluene	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	5.0	µg/L	46	2-Chlorotoluene	ND	5.0	µg/L
12	cis-1,2-Dichloroethene	ND	5.0	µg/L	47	1,3,5-Trimethylbenzene	48	5.0	µg/L
13	Bromochloromethane	ND	5.0	µg/L	48	tert-Butylbenzene	ND	5.0	µg/L
14	Chloroform	ND	5.0	µg/L	49	1,2,4-Trimethylbenzene	220	5.0	µg/L
15	2,2-Dichloropropane	ND	5.0	µg/L	50	sec-Butylbenzene	12	5.0	µg/L
16	1,2-Dichloroethane	ND	5.0	µg/L	51	1,3-Dichlorobenzene	ND	5.0	µg/L
17	1,1,1-Trichloroethane	ND	5.0	µg/L	52	1,4-Dichlorobenzene	ND	5.0	µg/L
18	1,1-Dichloropropene	ND	5.0	µg/L	53	4-Isopropyltoluene	ND	5.0	µg/L
19	Carbon tetrachloride	ND	5.0	µg/L	54	1,2-Dichlorobenzene	ND	5.0	µg/L
20	Benzene	ND *	2.5	µg/L	55	n-Butylbenzene	18	5.0	µg/L
21	Dibromomethane	ND	5.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	30	µg/L
22	1,2-Dichloropropane	ND	5.0	µg/L	57	1,2,4-Trichlorobenzene	ND	20	µg/L
23	Trichloroethene	ND	5.0	µg/L	58	Naphthalene	260	20	µg/L
24	Bromodichloromethane	ND	5.0	µg/L	59	Hexachlorobutadiene	ND	20	µg/L
25	cis-1,3-Dichloropropene	ND	5.0	µg/L	60	1,2,3-Trichlorobenzene	ND	20	µg/L
26	trans-1,3-Dichloropropene	ND	5.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	105		%REC
27	1,1,2-Trichloroethane	ND	5.0	µg/L	62	Surr: Toluene-d8	92		%REC
28	Toluene	ND	2.5	µg/L	63	Surr: 4-Bromofluorobenzene	100		%REC
29	1,3-Dichloropropane	ND	5.0	µg/L					
30	Dibromochloromethane	ND	5.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	20	µg/L					
32	Tetrachloroethene	ND	5.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	5.0	µg/L					
34	Chlorobenzene	ND	5.0	µg/L					
35	Ethylbenzene	420	2.5	µg/L					

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 1.3 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-05A
Client I.D. Number: 21503-MW01D

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	5.0	µg/L	36	m,p-Xylene	96	2.5	µg/L
2	Chloromethane	ND	20	µg/L	37	Bromoform	ND	5.0	µg/L
3	Vinyl chloride	ND	5.0	µg/L	38	Styrene	ND	5.0	µg/L
4	Chloroethane	ND	5.0	µg/L	39	o-Xylene	5.5	2.5	µg/L
5	Bromomethane	ND	20	µg/L	40	1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
6	Trichlorofluoromethane	ND	5.0	µg/L	41	1,2,3-Trichloropropane	ND	20	µg/L
7	1,1-Dichloroethene	ND	5.0	µg/L	42	Isopropylbenzene	45	5.0	µg/L
8	Dichloromethane	ND	20	µg/L	43	Bromobenzene	ND	5.0	µg/L
9	trans-1,2-Dichloroethene	ND	5.0	µg/L	44	n-Propylbenzene	140	5.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	2.5	µg/L	45	4-Chlorotoluene	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	5.0	µg/L	46	2-Chlorotoluene	ND	5.0	µg/L
12	cis-1,2-Dichloroethene	ND	5.0	µg/L	47	1,3,5-Trimethylbenzene	54	5.0	µg/L
13	Bromochloromethane	ND	5.0	µg/L	48	tert-Butylbenzene	ND	5.0	µg/L
14	Chloroform	ND	5.0	µg/L	49	1,2,4-Trimethylbenzene	250	5.0	µg/L
15	2,2-Dichloropropane	ND	5.0	µg/L	50	sec-Butylbenzene	13	5.0	µg/L
16	1,2-Dichloroethane	ND	5.0	µg/L	51	1,3-Dichlorobenzene	ND	5.0	µg/L
17	1,1,1-Trichloroethane	ND	5.0	µg/L	52	1,4-Dichlorobenzene	ND	5.0	µg/L
18	1,1-Dichloropropene	ND	5.0	µg/L	53	4-Isopropyltoluene	ND	5.0	µg/L
19	Carbon tetrachloride	ND	5.0	µg/L	54	1,2-Dichlorobenzene	ND	5.0	µg/L
20	Benzene	ND *	2.5	µg/L	55	n-Butylbenzene	19	5.0	µg/L
21	Dibromomethane	ND	5.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	30	µg/L
22	1,2-Dichloropropane	ND	5.0	µg/L	57	1,2,4-Trichlorobenzene	ND	20	µg/L
23	Trichloroethene	ND	5.0	µg/L	58	Naphthalene	300	20	µg/L
24	Bromodichloromethane	ND	5.0	µg/L	59	Hexachlorobutadiene	ND	20	µg/L
25	cis-1,3-Dichloropropene	ND	5.0	µg/L	60	1,2,3-Trichlorobenzene	ND	20	µg/L
26	trans-1,3-Dichloropropene	ND	5.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND	5.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	2.5	µg/L	63	Surr: 4-Bromofluorobenzene	101		%REC
29	1,3-Dichloropropane	ND	5.0	µg/L					
30	Dibromochloromethane	ND	5.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	20	µg/L					
32	Tetrachloroethene	ND	5.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	5.0	µg/L					
34	Chlorobenzene	ND	5.0	µg/L					
35	Ethylbenzene	460	2.5	µg/L					

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 1.3 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-06A
Client I.D. Number: 21503-MW02

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND		4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	*	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	116		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-07A
Client I.D. Number: 21503-MW03

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	111		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	99		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	113		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-08A
Client I.D. Number: 21503-MW04

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND		4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	*	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	112		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	111		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-01A
Client I.D. Number: 21503-QCTB

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	101		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	115		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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5/4/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-02A
Client I.D. Number: 21503-QCFB

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND		2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	*	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	115		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		2.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order BMI05042126 **Project:** DO102

Alpha's Sample ID	Client's Sample ID	Matrix	pH
05042126-01A	21503-QCTB	Aqueous	
05042126-02A	21503-QCFB	Aqueous	2
05042126-03A	21503-QCEB	Aqueous	2
05042126-04A	21503-MW01	Aqueous	2
05042126-05A	21503-MW01D	Aqueous	2
05042126-06A	21503-MW02	Aqueous	2
05042126-07A	21503-MW03	Aqueous	2
05042126-08A	21503-MW04	Aqueous	2

5/4/05

Report Date

Alpha Analytical, Inc.

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Method Blank Type: **MBLK** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042505.D** Batch ID: **MS10W0425A** Analysis Date: **04/25/2005 11:23**

Sample ID: **MBLK MS10W0425A** Units : **µg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	5								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								
Surr: 1,2-Dichloroethane-d4	10.2		10		102	76	127			
Surr: Toluene-d8	9.93		10		99	84	113			
Surr: 4-Bromofluorobenzene	11.1		10		111	79	119			

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Laboratory Control Spike Type: **LCS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042504.D** Batch ID: **MS10W0425A** Analysis Date: **04/25/2005 11:02**

Sample ID: **LCS MS10W0425A** Units : **µg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.29	1	10		83	32	129			
Chloromethane	8.72	2	10		87	44	121			
Vinyl chloride	9.99	1	10		99.9	80	120			
Chloroethane	8.82	1	10		88	52	142			
Bromomethane	7.21	2	10		72	5	151			
Trichlorofluoromethane	9.69	1	10		97	70	141			
1,1-Dichloroethene	9.96	1	10		99.6	80	120			
Dichloromethane	8.71	2	10		87	73	117			
trans-1,2-Dichloroethene	10.2	1	10		102	74	129			
1,1-Dichloroethane	9.97	1	10		99.7	78	125			
cis-1,2-Dichloroethene	10	1	10		100	79	126			
Bromochloromethane	9.67	1	10		97	76	126			
Chloroform	9.55	1	10		96	80	120			
2,2-Dichloropropane	10.1	1	10		101	71	156			
1,2-Dichloroethane	9.65	1	10		97	72	135			
1,1,1-Trichloroethane	8.99	1	10		90	74	132			
1,1-Dichloropropene	10.1	1	10		101	83	129			
Carbon tetrachloride	8.81	1	10		88	68	137			
Benzene	9.4	0.5	10		94	81	122			
Dibromomethane	9.67	1	10		97	75	127			
1,2-Dichloropropane	9.64	1	10		96	80	120			
Trichloroethene	8.95	1	10		90	74	125			
Bromodichloromethane	9.5	1	10		95	75	130			
cis-1,3-Dichloropropene	10.4	1	10		104	78	128			
trans-1,3-Dichloropropene	9.81	1	10		98	74	134			
1,1,2-Trichloroethane	9.47	1	10		95	75	129			
Toluene	9.56	0.5	10		96	80	120			
1,3-Dichloropropane	11	1	10		110	73	129			
Dibromochloromethane	9.91	1	10		99	71	130			
1,2-Dibromoethane (EDB)	21	2	20		105	75	132			
Tetrachloroethene	9.81	1	10		98	73	131			
1,1,1,2-Tetrachloroethane	9.73	1	10		97	78	125			
Chlorobenzene	9.63	1	10		96	79	124			
Ethylbenzene	9.77	0.5	10		98	80	120			
m,p-Xylene	9.66	0.5	10		97	80	129			
Bromoform	9.88	1	10		99	66	138			
Styrene	10.1	1	10		101	79	130			
o-Xylene	9.5	0.5	10		95	80	129			
1,1,2,2-Tetrachloroethane	9.79	1	10		98	63	142			
1,2,3-Trichloropropane	20.2	2	20		101	73	132			
Isopropylbenzene	11.4	1	10		114	78	133			
Bromobenzene	9.87	1	10		99	76	127			
n-Propylbenzene	10.7	1	10		107	78	130			
4-Chlorotoluene	11.1	1	10		111	80	129			
2-Chlorotoluene	10.7	1	10		107	79	129			
1,3,5-Trimethylbenzene	11.1	1	10		111	77	134			
tert-Butylbenzene	11.1	1	10		111	80	129			
1,2,4-Trimethylbenzene	10.5	1	10		105	77	133			
sec-Butylbenzene	10.8	1	10		108	79	129			
1,3-Dichlorobenzene	10.9	1	10		109	80	125			
1,4-Dichlorobenzene	10.5	1	10		105	79	125			
4-Isopropyltoluene	10.5	1	10		105	77	133			
1,2-Dichlorobenzene	9.95	1	10		100	79	119			
n-Butylbenzene	10.5	1	10		105	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	52.7	3	50		105	61	138			
1,2,4-Trichlorobenzene	11.3	2	10		113	55	139			
Naphthalene	11.4	2	10		114	35	150			
Hexachlorobutadiene	20.5	2	20		103	65	135			
1,2,3-Trichlorobenzene	10.4	2	10		104	39	147			
Surr: 1,2-Dichloroethane-d4	10.3		10		103	76	127			
Surr: Toluene-d8	9.96		10		99.6	84	113			
Surr: 4-Bromofluorobenzene	10.3		10		103	79	119			

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Sample Matrix Spike Type: **MS** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042518.D** Batch ID: **MS10W0425A** Analysis Date: **04/25/2005 16:01**

Sample ID: **05042126-08AMS** Units : **µg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	32.8	2.5	50	0	66	17	130			
Chloromethane	36.9	10	50	0	74	31	127			
Vinyl chloride	47.1	2.5	50	0	94	52	131			
Chloroethane	45.9	2.5	50	0	92	40	146			
Bromomethane	37.4	10	50	0	75	4	152			
Trichlorofluoromethane	49.6	2.5	50	0	99	57	143			
1,1-Dichloroethene	50.7	2.5	50	0	101	65	127			
Dichloromethane	45.9	10	50	0	92	68	119			
trans-1,2-Dichloroethene	55.8	2.5	50	0	112	67	131			
1,1-Dichloroethane	54.1	2.5	50	0	108	71	128			
cis-1,2-Dichloroethene	54.6	2.5	50	0	109	73	129			
Bromochloromethane	48.7	2.5	50	0	97	71	130			
Chloroform	51.2	2.5	50	0	102	71	124			
2,2-Dichloropropane	49.7	2.5	50	0	99	52	157			
1,2-Dichloroethane	50.8	2.5	50	0	102	68	139			
1,1,1-Trichloroethane	49.2	2.5	50	0	98	67	134			
1,1-Dichloropropene	53.8	2.5	50	0	108	75	130			
Carbon tetrachloride	47.6	2.5	50	0	95	62	137			
Benzene	47.4	1.3	50	0	95	74	125			
Dibromomethane	47.7	2.5	50	0	95	73	130			
1,2-Dichloropropane	50.5	2.5	50	0	101	72	130			
Trichloroethene	45.9	2.5	50	0	92	66	126			
Bromodichloromethane	46.8	2.5	50	0	94	70	133			
cis-1,3-Dichloropropene	47.6	2.5	50	0	95	61	130			
trans-1,3-Dichloropropene	43.7	2.5	50	0	87	67	134			
1,1,2-Trichloroethane	45	2.5	50	0	90	72	132			
Toluene	46.5	1.3	50	0	93	76	120			
1,3-Dichloropropane	55	2.5	50	0	110	73	129			
Dibromochloromethane	49.8	2.5	50	0	99.5	70	130			
1,2-Dibromoethane (EDB)	103	10	100	0	103	75	133			
Tetrachloroethene	45.8	2.5	50	0	92	66	131			
1,1,1,2-Tetrachloroethane	49.1	2.5	50	0	98	76	126			
Chlorobenzene	47.8	2.5	50	0	96	76	124			
Ethylbenzene	47.1	1.3	50	0	94	77	124			
m,p-Xylene	46	1.3	50	0	92	73	130			
Bromoform	49	2.5	50	0	98	66	140			
Styrene	51	2.5	50	0	102	73	131			
o-Xylene	45.6	1.3	50	0	91	74	131			
1,1,2,2-Tetrachloroethane	49.2	2.5	50	0	98	63	146			
1,2,3-Trichloropropane	101	10	100	0	101	73	136			
Isopropylbenzene	54.1	2.5	50	0	108	73	133			
Bromobenzene	47.3	2.5	50	0	95	75	127			
n-Propylbenzene	50	2.5	50	0	99.9	73	130			
4-Chlorotoluene	53.2	2.5	50	0	106	76	129			
2-Chlorotoluene	51	2.5	50	0	102	76	129			
1,3,5-Trimethylbenzene	52.4	2.5	50	0	105	70	135			
tert-Butylbenzene	52.7	2.5	50	0	105	74	129			
1,2,4-Trimethylbenzene	49.9	2.5	50	0	99.8	70	134			
sec-Butylbenzene	51.7	2.5	50	0	103	74	129			
1,3-Dichlorobenzene	51	2.5	50	0	102	77	125			
1,4-Dichlorobenzene	49.3	2.5	50	0	99	76	126			
4-Isopropyltoluene	48.8	2.5	50	0	98	71	133			
1,2-Dichlorobenzene	47.7	2.5	50	0	95	77	120			
n-Butylbenzene	47.5	2.5	50	0	95	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	238	15	250	0	95	61	142			
1,2,4-Trichlorobenzene	52.4	10	50	0	105	54	143			
Naphthalene	52.4	10	50	0	105	35	159			
Hexachlorobutadiene	93.7	10	100	0	94	60	136			
1,2,3-Trichlorobenzene	48.6	10	50	0	97	38	154			
Surr: 1,2-Dichloroethane-d4	53		50		106	76	127			
Surr: Toluene-d8	49.7		50		99	84	113			
Surr: 4-Bromofluorobenzene	51.2		50		102	79	119			

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Sample Matrix Spike Duplicate Type: **MSD** Test Code: **EPA Method SW8260B**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042519.D** Batch ID: **MS10W0425A** Analysis Date: **04/25/2005 16:23**

Sample ID: **05042126-08AMSD** Units : **µg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	32.7	2.5	50	0	65	17	130	32.77	0.2(16)	
Chloromethane	42	10	50	0	84	31	127	36.85	13.0(20)	
Vinyl chloride	46.9	2.5	50	0	94	52	131	47.13	0.5(16)	
Chloroethane	43.4	2.5	50	0	87	40	146	45.85	5.4(40)	
Bromomethane	40.1	10	50	0	80	4	152	37.43	6.8(32)	
Trichlorofluoromethane	44.6	2.5	50	0	89	57	143	49.59	10.6(22)	
1,1-Dichloroethene	45.6	2.5	50	0	91	65	127	50.68	10.6(17)	
Dichloromethane	43.6	10	50	0	87	68	119	45.9	5.2(15)	
trans-1,2-Dichloroethene	49.7	2.5	50	0	99	67	131	55.82	11.6(30)	
1,1-Dichloroethane	48.9	2.5	50	0	98	71	128	54.11	10.1(14)	
cis-1,2-Dichloroethene	49.8	2.5	50	0	99.6	73	129	54.61	9.2(23)	
Bromochloromethane	47.9	2.5	50	0	96	71	130	48.68	1.6(15)	
Chloroform	48.3	2.5	50	0	97	71	124	51.21	5.8(13)	
2,2-Dichloropropane	45.1	2.5	50	0	90	52	157	49.72	9.8(14)	
1,2-Dichloroethane	50.4	2.5	50	0	101	68	139	50.84	1.0(14)	
1,1,1-Trichloroethane	44.3	2.5	50	0	89	67	134	49.24	10.6(14)	
1,1-Dichloropropene	48.1	2.5	50	0	96	75	130	53.75	11.2(14)	
Carbon tetrachloride	42.4	2.5	50	0	85	62	137	47.58	11.4(15)	
Benzene	45	1.3	50	0	90	74	124	47.41	5.3(13)	
Dibromomethane	48.7	2.5	50	0	97	73	130	47.7	2.1(15)	
1,2-Dichloropropane	47.4	2.5	50	0	95	72	130	50.46	6.4(13)	
Trichloroethene	43.3	2.5	50	0	87	66	126	45.86	5.9(13)	
Bromodichloromethane	46	2.5	50	0	92	70	133	46.76	1.6(14)	
cis-1,3-Dichloropropene	47.6	2.5	50	0	95	61	130	47.56	0.1(15)	
trans-1,3-Dichloropropene	47.3	2.5	50	0	95	67	134	43.68	7.9(16)	
1,1,2-Trichloroethane	49.8	2.5	50	0	99.6	72	132	44.97	10.2(16)	
Toluene	44	1.3	50	0	88	76	119	46.54	5.6(13)	
1,3-Dichloropropane	52.1	2.5	50	0	104	73	129	54.97	5.3(15)	
Dibromochloromethane	48.2	2.5	50	0	96	70	130	49.77	3.2(15)	
1,2-Dibromoethane (EDB)	101	10	100	0	101	75	133	103.4	2.0(15)	
Tetrachloroethene	43.4	2.5	50	0	87	66	131	45.76	5.3(14)	
1,1,1,2-Tetrachloroethane	47.2	2.5	50	0	94	76	126	49.1	3.9(13)	
Chlorobenzene	47	2.5	50	0	94	76	120	47.76	1.6(12)	
Ethylbenzene	45.1	1.3	50	0	90	77	124	47.11	4.3(13)	
m,p-Xylene	44.7	1.3	50	0	89	73	130	45.97	2.8(14)	
Bromoform	49.6	2.5	50	0	99	66	140	48.97	1.4(16)	
Styrene	49.1	2.5	50	0	98	73	131	50.97	3.8(13)	
o-Xylene	44.2	1.3	50	0	88	74	131	45.59	3.1(13)	
1,1,2,2-Tetrachloroethane	51.7	2.5	50	0	103	63	146	49.23	4.8(17)	
1,2,3-Trichloropropane	102	10	100	0	102	73	136	101	1.0(19)	
Isopropylbenzene	52.4	2.5	50	0	105	73	133	54.14	3.3(15)	
Bromobenzene	46.9	2.5	50	0	94	75	127	47.31	0.8(18)	
n-Propylbenzene	49	2.5	50	0	98	73	130	49.96	2.0(14)	
4-Chlorotoluene	51.7	2.5	50	0	103	76	129	53.24	3.0(13)	
2-Chlorotoluene	49.8	2.5	50	0	99.6	76	129	50.99	2.4(13)	
1,3,5-Trimethylbenzene	50.8	2.5	50	0	102	70	135	52.35	3.1(14)	
tert-Butylbenzene	51.4	2.5	50	0	103	74	129	52.74	2.5(14)	
1,2,4-Trimethylbenzene	47.9	2.5	50	0	96	70	134	49.92	4.1(14)	
sec-Butylbenzene	50.1	2.5	50	0	100	74	129	51.66	3.0(14)	
1,3-Dichlorobenzene	50.3	2.5	50	0	101	77	125	50.95	1.4(12)	
1,4-Dichlorobenzene	48.8	2.5	50	0	98	76	126	49.3	1.0(12)	
4-Isopropyltoluene	47.7	2.5	50	0	95	71	133	48.8	2.3(15)	
1,2-Dichlorobenzene	47.5	2.5	50	0	95	77	120	47.65	0.3(12)	
n-Butylbenzene	46.8	2.5	50	0	94	63	138	47.48	1.6(15)	
1,2-Dibromo-3-chloropropane (DBCP)	246	15	250	0	98	61	142	238.1	3.1(17)	
1,2,4-Trichlorobenzene	54.5	10	50	0	109	54	143	52.4	3.9(21)	
Naphthalene	59.7	10	50	0	119	35	159	52.37	13.1(28)	
Hexachlorobutadiene	95.3	10	100	0	95	60	136	93.73	1.6(17)	
1,2,3-Trichlorobenzene	53.2	10	50	0	106	38	154	48.56	9.0(33)	
Surr: 1,2-Dichloroethane-d4	51.6		50		103	76	127			
Surr: Toluene-d8	47.7		50		95	84	113			
Surr: 4-Bromofluorobenzene	50.5		50		101	79	119			

Alpha Analytical, Inc.

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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Date: *06-May-05*

QC Summary Report

Work Order: 05042126

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042505.D** Batch ID: **MS10W0425B** Analysis Date: **04/25/2005 11:23**

Sample ID: **MBLK MS10W0425B** Units : **mg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0102		0.01		102	76	128			
Surr: Toluene-d8	0.00993		0.01		99	84	113			
Surr: 4-Bromofluorobenzene	0.0111		0.01		111	79	119			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042503.D** Batch ID: **MS10W0425B** Analysis Date: **04/25/2005 10:40**

Sample ID: **GLCS MS10W0425B** Units : **mg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	0.407	0.05	0.4		102	78	127			
Surr: 1,2-Dichloroethane-d4	0.0103		0.01		103	76	128			
Surr: Toluene-d8	0.00994		0.01		99	84	113			
Surr: 4-Bromofluorobenzene	0.0109		0.01		109	79	119			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042516.D** Batch ID: **MS10W0425B** Analysis Date: **04/25/2005 15:18**

Sample ID: **05042126-08AGS** Units : **mg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.3	0.25	2	0	115	70	139			
Surr: 1,2-Dichloroethane-d4	0.0552		0.05		110	76	128			
Surr: Toluene-d8	0.0473		0.05		95	84	113			
Surr: 4-Bromofluorobenzene	0.0525		0.05		105	79	119			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015B/DHS LUFT Manual**

File ID: **D:\HPCHEM\MS10\DATA\050425\05042517.D** Batch ID: **MS10W0425B** Analysis Date: **04/25/2005 15:40**

Sample ID: **05042126-08AGSD** Units : **mg/L** Run ID: **MSD_10_050425A** Prep Date: **04/25/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH Purgeable	2.03	0.25	2	0	102	70	139	2.302	12.6(12)	R5
Surr: 1,2-Dichloroethane-d4	0.0529		0.05		106	76	128			
Surr: Toluene-d8	0.0487		0.05		97	84	113			
Surr: 4-Bromofluorobenzene	0.0538		0.05		108	79	119			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name Alpha Analytical
Address 255 Glendale, Suite 21
SPARKS, NV 89431
Phone 775 355 1044

Page # 1 of 1

Client Name **Battelle Memorial Institute**	P.O. # 190907	D.O. 102	
Address **505 King Avenue**	PWS #	DWR #	
City, State, Zip **Columbus, OH 43201**	Phone # 614 424 3779	Fax # 614 424 3667	
Sampled by MW/GH	Report Attention Chris Zimmerman		

Analyses Required

DATA REPORT: NEDTS FORMAT ☒ EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	TPH/P GAS	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other:	Other:	REMARKS
—	4-19	AQ	05042126-01	21503-QCTB	1V							X			
1020	4-19	AQ	2	21503-QCFB	3V							X			
1111	4-19	AQ	3	21503-QCEB	3V		X								
1150	4-19	AQ	4	21503-MW01	5V		X					X			
1150	4-19	AQ	5	21503-MW01D	5V		X					X			
1144	4-19	AQ	6	21503-MW02	5V		X					X			
1045	4-19	AQ	7	21503-MW03	5V		X					X			
1051	4-19	AQ	8	21503-MW04	5V		X					X			

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** *See attached sheet.

DATA VALIDATION REQUIRED FOR 21503-MW04.

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	Greg Headington	Battelle	20 APR 05	0815
Received by	Graciela Navarrete	G. Navarrete	Alpha	4-21-05	3:45
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Coonfare
TEL : (614) 424-3646 x
FAX : (614) 424-3667
EMail coonfare@battelle.org

CA

WorkOrder : BMI05042126

Report Due By : 5:00 PM On : 05-May-0

EDD Required : **Yes** PDF Required : **No**

Sampled by : MW/GH

Report Attention : ~~Chris Coonfare~~
CC Report : Chris Zimmerman

Job : DO102
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

21-Apr-05

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TPH/P_W	VOC_W					Sample Remarks
BMI05042126-01A	21503-QCTB	AQ	04/19/05 00:00	1	0	10			8260/ Mtbe_C					TB lab provided with date of 3/15/05.
BMI05042126-02A	21503-QCFB	AQ	04/19/05 10:20	3	0	10			8260/ Mtbe_C					
BMI05042126-03A	21503-QCEB	AQ	04/19/05 11:11	3	0	10		GAS-C						
BMI05042126-04A	21503-MW01	AQ	04/19/05 11:50	5	0	10		GAS-C	8260/ Mtbe_C					
BMI05042126-05A	21503-MW01D	AQ	04/19/05 11:50	5	0	10		GAS-C	8260/ Mtbe_C					
BMI05042126-06A	21503-MW02	AQ	04/19/05 11:44	5	0	10		GAS-C	8260/ Mtbe_C					
BMI05042126-07A	21503-MW03	AQ	04/19/05 10:45	5	0	10		GAS-C	8260/ Mtbe_C					
BMI05042126-08A	21503-MW04	AQ	04/19/05 10:51	5	0	10		GAS-C	8260/ Mtbe_C					Data validation required for this site.

Comments: No security seals intact, ice frozen. Ca samples. Temp Blank #7291 @ 4'C. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Data validation required for last sample on coc #08. Needs NEDTS/EDF Format. Level IV QC required. : Report J-values for Benzene down to 0.25 ug/L.

	Signature	Print Name	Company	Date/Time
Received by:	Gracielo Navarrete	G. Navarrete	Alpha Analytical, Inc.	4/21/05 3:45

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Battelle
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- **List of VOCs that should have reported results by 8260B.**

1. Dichlorodifluoromethane
2. Chloromethane
3. Vinyl chloride
4. Chloroethane
5. Bromomethane
6. Trichlorofluoromethane
7. 1,1-Dichloroethene
8. Dichloromethane
9. trans-1,2-Dichlororthene
10. Methyl tert-butyl ether (MTBE)
11. 1,1-Dichloroethane
12. cis-1,2-Dichloroethane
13. Bromochloromethane
14. Chloroform
15. 2,2-Dichloropropane
16. 1,2-Dichloroethane
17. 1,1,1-Trichloroethane
18. 1,1-Dichloropropane
19. Carbon tetrachloride
20. Benzene
21. Dibromomethane
22. 1,2-Dichloropropane
23. Trichloroethene
24. Bromodichloromethane
25. cis-1,3-Dichloropropene
26. trans-1,3-Dichloropropene
27. 1,1,2-Trichloroethane
28. Toluene
29. 1,3-Dichloropropane
30. Dibromochloromethane
31. 1,2-Dibromoethane
32. Tetrachloroethene
33. 1,1,1,2-Tetrachloroethane
34. Chlorobenzene
35. Ethylbenzene
36. m,p-Xylene
37. Bromoform
38. Styene
39. o-Xylene
40. 1,12,2-Tetrachloroethane
41. 1,2,3-Trichloropropane
42. Isopropylbenzene
43. Bromobenzene
44. n-Propylbeneze
45. 4-Chlorotoluene
46. 2-Chlorotoluene
47. 1,3,5-Trimethylbenzene
48. tert-Butylbenzene
49. 1,2,4-Trimethylbenzene
50. sec-Butylbenzene
51. 1,3-Dichlorobenzene
52. 1,4-Dichlorobenzene
53. 4-Isopropyltoluene
54. 1,2-Dichlorobenzene
55. n-Butylbenzene
56. 1,2-Dibromo-3-chloropropane (DBCP)
57. 1,2,4-Trichlorobenzene
58. Naphthalene
59. Hexachlorobutadiene
60. 1,2,3-Trichlorobenzene

- **Analyte Detection Limits:**

TPH-JF = 0.05 mg/L
TPH-D = 0.05 mg/L
TPH-MO = 0.50 mg/L
BETX = 0.50 µg/L
Naphthalene = 2.0 µg/L
TMBs = 1.0 µg/L
MTBE = 0.50 µg/L

REPORT DATE IN NEDTS FORMAT
EDF FORMAT

metal field filtered

APPENDIX D:

LABORATORY DATA VALIDATION REPORTS

January 2005

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, TO 57

Collection Date: January 25, 2005

LDC Report Date: March 2, 2005

Matrix: Water

Parameters: Total Petroleum Hydrocarbons as Purgeables

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05012643

Sample Identification

21503-QCEB
21503-MW01
21503-MW02
21503-MW03
21503-MW04**
21503-MW01D

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Purgeables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as purgeable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG BMI05012643	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

Samples 21503-MW01 and 21503-MW01D were identified as field duplicates. No total petroleum hydrocarbons as purgeables were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	21503-MW01	21503-MW01D	
TPH as gasoline	12	11	9

X. Field Blanks

Sample 21503-QCEB was identified as an equipment blank. No total petroleum hydrocarbons as purgeable contaminants were found in this blank.

Camp Pendleton, TO 57
Total Petroleum Hydrocarbons as Purgeables - Data Qualification Summary - SDG BMI05012643

SDG	Sample	Compound	Flag	A or P	Reason
BMI05012643	21503-QCEB 21503-MW01 21503-MW02 21503-MW03 21503-MW04** 21503-MW01D	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, TO 57
Total Petroleum Hydrocarbons as Purgeables - Laboratory Blank Data Qualification Summary - SDG BMI05012643

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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I

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667
Date Received 01/26/05

Job#: TO57

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	21503-QCEB					
Lab ID :	BMI05012643-03A	TPH Purgeable	ND U	0.050 mg/L	01/25/05	02/01/05
		Surr: 1,2-Dichloroethane-d4	92	%REC	01/25/05	02/01/05
		Surr: Toluene-d8	106	%REC	01/25/05	02/01/05
		Surr: 4-Bromofluorobenzene	103	%REC	01/25/05	02/01/05
Client ID :	21503-MW01					
Lab ID :	BMI05012643-04A	TPH Purgeable	12	1.0 mg/L	01/25/05	01/31/05
		Surr: 1,2-Dichloroethane-d4	108	%REC	01/25/05	01/31/05
		Surr: Toluene-d8	98	%REC	01/25/05	01/31/05
		Surr: 4-Bromofluorobenzene	90	%REC	01/25/05	01/31/05
Client ID :	21503-MW02					
Lab ID :	BMI05012643-05A	TPH Purgeable	ND U O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	90	%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98	%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	94	%REC	01/25/05	01/28/05
Client ID :	21503-MW03					
Lab ID :	BMI05012643-06A	TPH Purgeable	ND U O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	93	%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98	%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	88	%REC	01/25/05	01/28/05
Client ID :	21503-MW04					
Lab ID :	BMI05012643-07A	TPH Purgeable	ND U O	0.10 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	94	%REC	01/25/05	01/28/05
		Surr: Toluene-d8	100	%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	89	%REC	01/25/05	01/28/05
Client ID :	21503-MW01D					
Lab ID :	BMI05012643-08A	TPH Purgeable	11	1.0 mg/L	01/25/05	01/28/05
		Surr: 1,2-Dichloroethane-d4	97	%REC	01/25/05	01/28/05
		Surr: Toluene-d8	98	%REC	01/25/05	01/28/05
		Surr: 4-Bromofluorobenzene	88	%REC	01/25/05	01/28/05

3/14/05

9

LDC #: 13191I7

SDG #: BMI05012643

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/1/05

Page: 1 of 1

Reviewer: 9

2nd Reviewer: [illegible]

METHOD: GC/MS TPH Purgeable (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/25/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	A	LCS. used as CCV - None/P
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 2+6
XVII.	Field blanks	ND	EB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	21503-QCEB	11	MBlk	21		31	
2	21503-MW01	12		22		32	
3	21503-MW02**	13		23		33	
4	21503-MW03	14		24		34	
5	21503-MW04 **	15		25		35	
6	21503-MW01D	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 131917
SDG #: BM1050126 #3

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 8

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?			✓	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) ≤ ~~30%~~ 30? ~~and relative response factors (RRF) ≥ 0.05~~?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?			✓	
Were all percent differences (%D) ≤ 25%? ~~and relative response factors (RRF) ≥ 0.05~~?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Was a MS/MSD analyzed every 20 samples of each matrix?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

LDC #: 13911T
SDG #: BM1050126F3

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			

LDC #: 13191IT
SDG #: BH1050 12643

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

LDC #: 13191T
SDG #: BN1080-643

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/L)		%RPD Limit ≤____	Qualification Parent only / All Samples
	2	6		
TPH-G	12	11	9	

Compound	Concentration ( )		%RPD Limit ≤____	Qualification Parent only / All Samples

LDC #: 13191T
SDG #: BM1050126A3

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: a
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC_____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1.00 std)	Recalculated CF (1.00 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	19XL	7/12/05	GRO	1.463	1.463	1.557	1.557	7.9	7.9
		3/2/04							
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

INICLC.1SB

LDC #: 13191IT
SDG #: BH1050126413

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	05012803	1/28/05	ERO	1.557	1.645	1.645	5.7	5.7
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13191IT
SDG #: BM1050126 43

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 5

Surrogate	surr spiked ~~Column/Detector~~	Surrogate ~~Spiked~~ Found	~~Surrogate Found~~	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
DCE	10	9.425	NA	94	94	0
TOL	↓	10.0	↓	100	100	↓
BFB	↓	8.855	↓	89	89	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 13911T
SDG #: 3410501264 3

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

_____METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory Control Sample
SC = Sample concentration
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: LCS

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	0.4	NA	—	0.404	NA	101	101				
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: B19117
SDG #: B4105012643

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: 9
2nd Reviewer: R

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 5 Compound Name ND

Concentration =

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, TO 57

Collection Date: January 25, 2005

LDC Report Date: March 11, 2005

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05012643

Sample Identification

21503-QCTB
21503-QCFB
21503-MW01
21503-MW02
21503-MW03
21503-MW04**
21503-MW01D

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) .

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
1/12/05	Bromodichloromethane	0.0472 (≥0.05)	All samples in SDG BMI05012643	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/28/05	Dichlorodifluoromethane Chloromethane Chloroethane	36.6 27.5 41.9	21503-QCTB 21503-QCFB 21503-MW02 21503-MW03 21503-MW04** 21503-MW01D MBLK1	J (all detects) UJ (all non-detects)	A
1/31/05	Dichlorodifluoromethane Chloromethane Chloroethane 2,2-Dichloropropane	45.1 25.8 41.4 27.2	21503-MW01 MBLK2	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG BMI05012643	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

Samples 21503-MW01 and 21503-MW01D were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	21503-MW01	21503-MW01D	
Ethylbenzene	960	1000	4
m,p-Xylenes	400	400	0

Compound	Concentration (ug/L)		RPD
	21503-MW01	21503-MW01D	
o-Xylene	35	32	9
Isopropylbenzene	94	93	1
n-Propylbenzene	270	280	4
1,3,5-Trimethylbenzene	190	170	11
1,2,4-Trimethylbenzene	730	680	7
sec-Butylbenzene	27	26	4
2-Chloroethylvinyl ether	32	33	3
Naphthalene	530	570	7

XVII. Field Blanks

Sample 21503-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 21503-QCFB was identified as a field blank. No volatile contaminants were found in this blank.

Camp Pendleton, TO 57
Volatiles - Data Qualification Summary - SDG BMI05012643

SDG	Sample	Compound	Flag	A or P	Reason
BMI05012643	21503-QCTB 21503-QCFB 21503-MW01 21503-MW02 21503-MW03 21503-MW04** 21503-MW01D	Bromodichloromethane	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
BMI05012643	21503-QCTB 21503-QCFB 21503-MW02 21503-MW03 21503-MW04** 21503-MW01D	Dichlorodifluoromethane Chloromethane Chloroethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI05012643	21503-MW01	Dichlorodifluoromethane Chloromethane Chloroethane 2,2-Dichloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI05012643	21503-QCTB 21503-QCFB 21503-MW01 21503-MW02 21503-MW03 21503-MW04** 21503-MW01D	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, TO 57
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI05012643

No Sample Data Qualified in this SDG

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-01A
Client I.D. Number: 21503-QCTB

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	1.0	µg/L
2	Chloromethane	ND UJ	2.0	µg/L
3	Vinyl chloride	ND U	1.0	µg/L
4	Chloroethane	ND UJ	1.0	µg/L
5	Bromomethane	ND U	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND UX	1.0	µg/L
16	1,2-Dichloroethane	ND U	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L
25	cis-1,3-Dichloropropene	ND U	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND U	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	99		%REC
62	Surr: Toluene-d8	100		%REC
63	Surr: 4-Bromofluorobenzene	102		%REC

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/9/05
Report Date

3/14/05

11

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-02A
Client I.D. Number: 21503-QCFB

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	1.0	µg/L
2	Chloromethane	ND UJ	2.0	µg/L
3	Vinyl chloride	ND U	1.0	µg/L
4	Chloroethane	ND UJ	1.0	µg/L
5	Bromomethane	ND U	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND UJ	1.0	µg/L
16	1,2-Dichloroethane	ND U	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L
25	cis-1,3-Dichloropropene	ND U	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND U	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	99		%REC
62	Surr: Toluene-d8	102		%REC
63	Surr: 4-Bromofluorobenzene	98		%REC

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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2/9/05
Report Date

3/14/05

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-04A
Client I.D. Number: 21503-MW01

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/31/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	10	µg/L
2	Chloromethane	ND UJ	40	µg/L
3	Vinyl chloride	ND U	10	µg/L
4	Chloroethane	ND UJ	10	µg/L
5	Bromomethane	ND U	40	µg/L
6	Trichlorofluoromethane	ND	10	µg/L
7	1,1-Dichloroethene	ND	10	µg/L
8	Dichloromethane	ND	40	µg/L
9	trans-1,2-Dichloroethene	ND	10	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	10	µg/L
12	cis-1,2-Dichloroethene	ND	10	µg/L
13	Bromochloromethane	ND	10	µg/L
14	Chloroform	ND	10	µg/L
15	2,2-Dichloropropane	ND UJ	10	µg/L
16	1,2-Dichloroethane	ND U	10	µg/L
17	1,1,1-Trichloroethane	ND	10	µg/L
18	1,1-Dichloropropene	ND	10	µg/L
19	Carbon tetrachloride	ND	10	µg/L
20	Benzene	ND *	5.0	µg/L
21	Dibromomethane	ND	10	µg/L
22	1,2-Dichloropropane	ND	10	µg/L
23	Trichloroethene	ND	10	µg/L
24	Bromodichloromethane	ND UJ	10	µg/L
25	cis-1,3-Dichloropropene	ND U	10	µg/L
26	trans-1,3-Dichloropropene	ND	10	µg/L
27	1,1,2-Trichloroethane	ND	10	µg/L
28	Toluene	ND	5.0	µg/L
29	1,3-Dichloropropane	ND	10	µg/L
30	Dibromochloromethane	ND	10	µg/L
31	1,2-Dibromoethane (EDB)	ND	40	µg/L
32	Tetrachloroethene	ND	10	µg/L
33	1,1,1,2-Tetrachloroethane	ND	10	µg/L
34	Chlorobenzene	ND	10	µg/L
35	Ethylbenzene	960	5.0	µg/L
36	m,p-Xylene	400	5.0	µg/L
37	Bromoform	ND U	10	µg/L
38	Styrene	ND	10	µg/L
39	o-Xylene	35	5.0	µg/L
40	1,1,2,2-Tetrachloroethane	ND U	10	µg/L
41	1,2,3-Trichloropropane	ND	40	µg/L
42	Isopropylbenzene	94	10	µg/L
43	Bromobenzene	ND U	10	µg/L
44	n-Propylbenzene	270	10	µg/L
45	4-Chlorotoluene	ND U	10	µg/L
46	2-Chlorotoluene	ND	10	µg/L
47	1,3,5-Trimethylbenzene	190	10	µg/L
48	tert-Butylbenzene	ND U	10	µg/L
49	1,2,4-Trimethylbenzene	730	10	µg/L
50	sec-Butylbenzene	27	10	µg/L
51	1,3-Dichlorobenzene	ND U	10	µg/L
52	1,4-Dichlorobenzene	ND	10	µg/L
53	4-Isopropyltoluene	ND	10	µg/L
54	1,2-Dichlorobenzene	ND	10	µg/L
55	n-Butylbenzene	32	10	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND U	60	µg/L
57	1,2,4-Trichlorobenzene	ND	40	µg/L
58	Naphthalene	530	40	µg/L
59	Hexachlorobutadiene	ND U	40	µg/L
60	1,2,3-Trichlorobenzene	ND	40	µg/L
61	Surr: 1,2-Dichloroethane-d4	108		%REC
62	Surr: Toluene-d8	98		%REC
63	Surr: 4-Bromofluorobenzene	90		%REC

Reporting Limits were increased due to high concentrations of target analytes.
*No Benzene was observed above an estimated reporting limit of 2.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

3/14/05

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-05A
Client I.D. Number: 21503-MW02

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	1.0	µg/L
2	Chloromethane	ND UJ	4.0	µg/L
3	Vinyl chloride	ND U	1.0	µg/L
4	Chloroethane	ND UJ	1.0	µg/L
5	Bromomethane	ND U	4.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND UX	1.0	µg/L
16	1,2-Dichloroethane	ND U	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L
25	cis-1,3-Dichloropropene	ND U	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L

	Compound	Concentration	Reporting Limit	
36	m,p-Xylene	ND U	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	4.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
58	Naphthalene	ND	4.0	µg/L
59	Hexachlorobutadiene	ND	4.0	µg/L
60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	90		%REC
62	Surr: Toluene-d8	98		%REC
63	Surr: 4-Bromofluorobenzene	94		%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/9/05
Report Date

3/14/05

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-06A
Client I.D. Number: 21503-MW03

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	1.0	µg/L
2	Chloromethane	ND UJ	4.0	µg/L
3	Vinyl chloride	ND U	1.0	µg/L
4	Chloroethane	ND UJ	1.0	µg/L
5	Bromomethane	ND U	4.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND UJ	1.0	µg/L
16	1,2-Dichloroethane	ND U	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L
25	cis-1,3-Dichloropropene	ND U	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND U	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	4.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
58	Naphthalene	ND	4.0	µg/L
59	Hexachlorobutadiene	ND	4.0	µg/L
60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	93		%REC
62	Surr: Toluene-d8	98		%REC
63	Surr: 4-Bromofluorobenzene	88		%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/9/05
Report Date

3/14/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-07A
Client I.D. Number: 21503-MW04

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	1.0	µg/L
2	Chloromethane	ND UJ	4.0	µg/L
3	Vinyl chloride	ND U	1.0	µg/L
4	Chloroethane	ND UJ	1.0	µg/L
5	Bromomethane	ND U	4.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND UJ	1.0	µg/L
16	1,2-Dichloroethane	ND U	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L
25	cis-1,3-Dichloropropene	ND U	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND U	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	4.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
58	Naphthalene	ND	4.0	µg/L
59	Hexachlorobutadiene	ND	4.0	µg/L
60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	94		%REC
62	Surr: Toluene-d8	100		%REC
63	Surr: 4-Bromofluorobenzene	89		%REC

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/9/05
Report Date

3/14/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO57

Attn: Melody Graves
Phone: (614) 424-5922
Fax: (614) 424-3667

Alpha Analytical Number: BMI05012643-08A
Client I.D. Number: 21503-MW01D

Sampled: 01/25/05
Received: 01/26/05
Analyzed: 01/28/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND UJ	10	µg/L
2	Chloromethane	ND UJ	40	µg/L
3	Vinyl chloride	ND U	10	µg/L
4	Chloroethane	ND UJ	10	µg/L
5	Bromomethane	ND U	40	µg/L
6	Trichlorofluoromethane	ND	10	µg/L
7	1,1-Dichloroethene	ND	10	µg/L
8	Dichloromethane	ND	40	µg/L
9	trans-1,2-Dichloroethene	ND	10	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	10	µg/L
12	cis-1,2-Dichloroethene	ND	10	µg/L
13	Bromochloromethane	ND	10	µg/L
14	Chloroform	ND	10	µg/L
15	2,2-Dichloropropane	ND UJ	10	µg/L
16	1,2-Dichloroethane	ND	10	µg/L
17	1,1,1-Trichloroethane	ND U	10	µg/L
18	1,1-Dichloropropene	ND	10	µg/L
19	Carbon tetrachloride	ND	10	µg/L
20	Benzene	ND	5.0	µg/L
21	Dibromomethane	ND	10	µg/L
22	1,2-Dichloropropane	ND	10	µg/L
23	Trichloroethene	ND	10	µg/L
24	Bromodichloromethane	ND UJ	10	µg/L
25	cis-1,3-Dichloropropene	ND U	10	µg/L
26	trans-1,3-Dichloropropene	ND	10	µg/L
27	1,1,2-Trichloroethane	ND	10	µg/L
28	Toluene	ND	5.0	µg/L
29	1,3-Dichloropropane	ND	10	µg/L
30	Dibromochloromethane	ND	10	µg/L
31	1,2-Dibromoethane (EDB)	ND	40	µg/L
32	Tetrachloroethene	ND	10	µg/L
33	1,1,1,2-Tetrachloroethane	ND	10	µg/L
34	Chlorobenzene	ND	10	µg/L
35	Ethylbenzene	1,000	5.0	µg/L
36	m,p-Xylene	400	5.0	µg/L
37	Bromoform	ND U	10	µg/L
38	Styrene	ND	10	µg/L
39	o-Xylene	32	5.0	µg/L
40	1,1,2,2-Tetrachloroethane	ND U	10	µg/L
41	1,2,3-Trichloropropane	ND	40	µg/L
42	Isopropylbenzene	93	10	µg/L
43	Bromobenzene	ND U	10	µg/L
44	n-Propylbenzene	280	10	µg/L
45	4-Chlorotoluene	ND U	10	µg/L
46	2-Chlorotoluene	ND	10	µg/L
47	1,3,5-Trimethylbenzene	170	10	µg/L
48	tert-Butylbenzene	ND U	10	µg/L
49	1,2,4-Trimethylbenzene	680	10	µg/L
50	sec-Butylbenzene	26	10	µg/L
51	1,3-Dichlorobenzene	ND U	10	µg/L
52	1,4-Dichlorobenzene	ND	10	µg/L
53	4-Isopropyltoluene	ND	10	µg/L
54	1,2-Dichlorobenzene	ND	10	µg/L
55	n-Butylbenzene	33	10	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND U	60	µg/L
57	1,2,4-Trichlorobenzene	ND	40	µg/L
58	Naphthalene	570	40	µg/L
59	Hexachlorobutadiene	ND U	40	µg/L
60	1,2,3-Trichlorobenzene	ND	40	µg/L
61	Surr: 1,2-Dichloroethane-d4	97		%REC
62	Surr: Toluene-d8	98		%REC
63	Surr: 4-Bromofluorobenzene	88		%REC

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 2.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/9/05
Report Date

3/14/05

LDC #: 13191I1
SDG #: BMI05012643
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/1/05
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/25/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	%RSD. r^2
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	A	LCS. LCS used as CCV - None/P
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3 + 7
XVII.	Field blanks	ND	TB = 1. FB = 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation
MH=0s

1	21503-QCTB	11	MB4-1	21		31	
2	21503-QCFB	12	MB4-2	22		32	
3	21503-MW01	13		23		33	
4	21503-MW02**	14		24		34	
5	21503-MW03	15		25		35	
6	21503-MW04 **	16		26		36	
7	21503-MW01D	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13191/1
SDG #: BM1050126F3

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: [illegible]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Was a MS/MSD analyzed every 20 samples of each matrix?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

LDC #: 1319111
SDG #: BH10501264

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: V

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			

LDC #: 1319111
SDG #: BM1050K2643

VALIDATION FINDINGS CHECKLIST

Reviewer: a
2nd Reviewer: a

Validation Area	Yes	No	NA	Findings/Comments
XVII. Field blanks				
Field blanks were identified in this SDG.	✓		✓	
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Methyl ethyl ketone
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Ethyl ether
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Benzyl chloride
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 13191 RN1
SDG #: BMJ0501264 3

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/12/05	KAC	P		0.0472	M+BK	J/UJ/A *
							* good response

INICAL.1SB

LDC #: 131911
SDG #: BM1050 F643

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/28/05	05012804	VV	36.6		~~MB~~ 1-2	J/UJ/A
			A	27.5		4-7 MBck1	
			D	41.9			
	1/31/05	05013107	VV	45.1		3 MBck2	J/UJ/A
			A	25.8			
			D	41.1			
			OO	27.2			

CONCAL.1S

LDC#: 13191I1
SDG#: BMI05012643

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 8260B)
Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD	
	3	7		
EE	960	1000	4	
RRR	400	400	0	
SSS	35	32	9	
VV	94	93	1	
YY	270	280	4	
AAA	190	170	11	
DDD	730	680	7	
EEE	27	26	4	
III	32	33	3	
MMM	530	570	7	

V:\FIELD DUPLICATES\13191I1a.wpd

LDC #: ~~1264~~ 1319111
SDG #: BM1050126-3

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (/ std)	Recalculated RRF (/ std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/~~26~~ 12/05	~~Methylene chloride~~ H (1st internal standard)	0.2932	0.2932	0.2568	0.2568	13.9	13.9
			~~Trichlorethene~~ CC (2nd internal standard)	3.471	3.471	3.332	3.332	9.3	9.3
			~~Toluene~~ VV (3rd internal standard)	3.723	3.723	4.198	4.198	14.1	14.1
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 134111
SDG #: BU1050126 43

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	[illegible]	1/28/05	~~Methylene chloride~~ H (1st internal standard)	0.2568	0.292	0.292	13.6	13.7
			~~Trichlorethene~~ CC (2nd internal standard)	3.332	3.323	3.323	0.3	0.3
			~~Toluene~~ VV (3rd internal standard)	4.198	4.329	4.329	3.1	3.1
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13191 1
SDG #: BM1050126 4-3

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 6

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	10.00	100	100	0
Bromofluorobenzene	↓	8.855	89	89	↓
1,2-Dichloroethane-d4	↓	9.425	94	94	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

SDG #: ~~BM1050164~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer: K

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboraotry control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	10	NA	11.4	NA	114	114				
Trichloroethene	↓	↓	9.89	↓	99	99				
Benzene	↓	↓	9.44	↓	94	94				
Toluene	↓	↓	9.97	↓	99.7	99.7				
Chlorobenzene	↓	↓	10.4	↓	104	104				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LCSCLC.1SB

LDC #: 13191 1
SDG #: BM10501-643

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: T
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 6, NO:

Conc. = ( ) ( ) ( ) / ( ) ( ) ( ) ( )

=

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

April 2005

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: April 19, 2005

LDC Report Date: June 3, 2005

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): 05042126

Sample Identification

21503-QCTB
21503-QCFB
21503-MW01
21503-MW01D
21503-MW02
21503-MW03
21503-MW04**
21503-MW04MS
21503-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) .

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
4/19/05	Bromodichloromethane	0.04643 (≥0.05)	All samples in SDG 05042126	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
4/25/05	Bromomethane	27.9	All samples in SDG 05042126	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
4/25/05	Bromodichloromethane	0.044 (≥0.05)	All samples in SDG 05042126	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG 05042126	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 21503-MW01 and 21503-MW01D were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	21503-MW01	21503-MW01D	
m,p-Xylenes	86	96	11
o-Xylene	5.4	5.5	2

Compound	Concentration (ug/L)		RPD
	21503-MW01	21503-MW01D	
Isopropylbenzene	42	45	7
n-Propylbenzene	120	140	15
1,3,5-Trimethylbenzene	48	54	12
1,2,4-Trimethylbenzene	220	250	13
sec-Butylbenzene	12	13	8
n-Butylbenzene	18	19	5
Naphthalene	260	300	14

XVII. Field Blanks

Sample 21503-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 21503-QCFB was identified as a field blank. No volatile contaminants were found in this blank.

Camp Pendleton, CTO 102
Volatiles - Data Qualification Summary - SDG 05042126

SDG	Sample	Compound	Flag	A or P	Reason
05042126	21503-QCTB 21503-QCFB 21503-MW01 21503-MW01D 21503-MW02 21503-MW03 21503-MW04**	Bromodichloromethane	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
05042126	21503-QCTB 21503-QCFB 21503-MW01 21503-MW01D 21503-MW02 21503-MW03 21503-MW04**	Bromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
05042126	21503-QCTB 21503-QCFB 21503-MW01 21503-MW01D 21503-MW02 21503-MW03 21503-MW04**	Bromodichloromethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
05042126	21503-QCTB 21503-QCFB 21503-MW01 21503-MW01D 21503-MW02 21503-MW03 21503-MW04**	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Volatiles - Laboratory Blank Data Qualification Summary - SDG 05042126

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-01A
Client I.D. Number: 21503-QCTB

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND UJ	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	101		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	115		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND Not Detected

Roger Scholl Randy Gardner Walter Hirchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

6/7/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-02A
Client I.D. Number: 21503-QCFB

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND UJ	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	1.0	µg/L	63	Surr: 4-Bromofluorobenzene	115		%REC
29	1,3-Dichloropropane	ND	0.50	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	1.0	µg/L					
32	Tetrachloroethene	ND	2.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	1.0	µg/L					
			0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman RS

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-04A
Client I.D. Number: 21503-MW01

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	5.0	µg/L	36 m,p-Xylene	86	2.5	µg/L
2	Chloromethane	ND	20	µg/L	37 Bromoform	ND	5.0	µg/L
3	Vinyl chloride	ND	5.0	µg/L	38 Styrene	ND	5.0	µg/L
4	Chloroethane	ND	5.0	µg/L	39 o-Xylene	5.4	2.5	µg/L
5	Bromomethane	ND UJ	20	µg/L	40 1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
6	Trichlorofluoromethane	ND	5.0	µg/L	41 1,2,3-Trichloropropane	ND	20	µg/L
7	1,1-Dichloroethene	ND	5.0	µg/L	42 Isopropylbenzene	42	5.0	µg/L
8	Dichloromethane	ND	20	µg/L	43 Bromobenzene	ND	5.0	µg/L
9	trans-1,2-Dichloroethene	ND	5.0	µg/L	44 n-Propylbenzene	120	5.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	2.5	µg/L	45 4-Chlorotoluene	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	5.0	µg/L	46 2-Chlorotoluene	ND	5.0	µg/L
12	cis-1,2-Dichloroethene	ND	5.0	µg/L	47 1,3,5-Trimethylbenzene	48	5.0	µg/L
13	Bromochloromethane	ND	5.0	µg/L	48 tert-Butylbenzene	ND	5.0	µg/L
14	Chloroform	ND	5.0	µg/L	49 1,2,4-Trimethylbenzene	220	5.0	µg/L
15	2,2-Dichloropropane	ND	5.0	µg/L	50 sec-Butylbenzene	12	5.0	µg/L
16	1,2-Dichloroethane	ND	5.0	µg/L	51 1,3-Dichlorobenzene	ND	5.0	µg/L
17	1,1,1-Trichloroethane	ND	5.0	µg/L	52 1,4-Dichlorobenzene	ND	5.0	µg/L
18	1,1-Dichloropropene	ND	5.0	µg/L	53 4-Isopropyltoluene	ND	5.0	µg/L
19	Carbon tetrachloride	ND	5.0	µg/L	54 1,2-Dichlorobenzene	ND	5.0	µg/L
20	Benzene	ND *	2.5	µg/L	55 n-Butylbenzene	18	5.0	µg/L
21	Dibromomethane	ND	5.0	µg/L	56 1,2-Dibromo-3-chloropropane (DBCP)	ND	30	µg/L
22	1,2-Dichloropropane	ND	5.0	µg/L	57 1,2,4-Trichlorobenzene	ND	20	µg/L
23	Trichloroethene	ND	5.0	µg/L	58 Naphthalene	260	20	µg/L
24	Bromodichloromethane	ND UJ	5.0	µg/L	59 Hexachlorobutadiene	ND	20	µg/L
25	cis-1,3-Dichloropropene	ND	5.0	µg/L	60 1,2,3-Trichlorobenzene	ND	20	µg/L
26	trans-1,3-Dichloropropene	ND	5.0	µg/L	61 Surr: 1,2-Dichloroethane-d4	105		%REC
27	1,1,2-Trichloroethane	ND	5.0	µg/L	62 Surr: Toluene-d8	92		%REC
28	Toluene	ND	2.5	µg/L	63 Surr: 4-Bromofluorobenzene	100		%REC
29	1,3-Dichloropropane	ND	5.0	µg/L				
30	Dibromochloromethane	ND	5.0	µg/L				
31	1,2-Dibromoethane (EDB)	ND	20	µg/L				
32	Tetrachloroethene	ND	5.0	µg/L				
33	1,1,1,2-Tetrachloroethane	ND	5.0	µg/L				
34	Chlorobenzene	ND	5.0	µg/L				
35	Ethylbenzene	420	2.5	µg/L				

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 1.3 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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5/4/05
Report Date

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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-05A
Client I.D. Number: 21503-MW01D

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	5.0	µg/L	36	m,p-Xylene	96	2.5	µg/L
2	Chloromethane	ND	20	µg/L	37	Bromoform	ND	5.0	µg/L
3	Vinyl chloride	ND	5.0	µg/L	38	Styrene	ND	5.0	µg/L
4	Chloroethane	ND	5.0	µg/L	39	o-Xylene	5.5	2.5	µg/L
5	Bromomethane	ND UJ	20	µg/L	40	1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
6	Trichlorofluoromethane	ND	5.0	µg/L	41	1,2,3-Trichloropropane	ND	20	µg/L
7	1,1-Dichloroethene	ND	5.0	µg/L	42	Isopropylbenzene	45	5.0	µg/L
8	Dichloromethane	ND	20	µg/L	43	Bromobenzene	ND	5.0	µg/L
9	trans-1,2-Dichloroethene	ND	5.0	µg/L	44	n-Propylbenzene	140	5.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	2.5	µg/L	45	4-Chlorotoluene	ND	5.0	µg/L
11	1,1-Dichloroethane	ND	5.0	µg/L	46	2-Chlorotoluene	ND	5.0	µg/L
12	cis-1,2-Dichloroethene	ND	5.0	µg/L	47	1,3,5-Trimethylbenzene	54	5.0	µg/L
13	Bromochloromethane	ND	5.0	µg/L	48	tert-Butylbenzene	ND	5.0	µg/L
14	Chloroform	ND	5.0	µg/L	49	1,2,4-Trimethylbenzene	250	5.0	µg/L
15	2,2-Dichloropropane	ND	5.0	µg/L	50	sec-Butylbenzene	13	5.0	µg/L
16	1,2-Dichloroethane	ND	5.0	µg/L	51	1,3-Dichlorobenzene	ND	5.0	µg/L
17	1,1,1-Trichloroethane	ND	5.0	µg/L	52	1,4-Dichlorobenzene	ND	5.0	µg/L
18	1,1-Dichloropropene	ND	5.0	µg/L	53	4-Isopropyltoluene	ND	5.0	µg/L
19	Carbon tetrachloride	ND	5.0	µg/L	54	1,2-Dichlorobenzene	ND	5.0	µg/L
20	Benzene	ND *	2.5	µg/L	55	n-Butylbenzene	19	5.0	µg/L
21	Dibromomethane	ND	5.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	30	µg/L
22	1,2-Dichloropropane	ND	5.0	µg/L	57	1,2,4-Trichlorobenzene	ND	20	µg/L
23	Trichloroethene	ND	5.0	µg/L	58	Naphthalene	300	20	µg/L
24	Bromodichloromethane	ND UJ	5.0	µg/L	59	Hexachlorobutadiene	ND	20	µg/L
25	cis-1,3-Dichloropropene	ND	5.0	µg/L	60	1,2,3-Trichlorobenzene	ND	20	µg/L
26	trans-1,3-Dichloropropene	ND	5.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND	5.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	5.0	µg/L	63	Surr: 4-Bromofluorobenzene	101		%REC
29	1,3-Dichloropropane	ND	2.5	µg/L					
30	Dibromochloromethane	ND	5.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	5.0	µg/L					
32	Tetrachloroethene	ND	20	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	5.0	µg/L					
34	Chlorobenzene	ND	5.0	µg/L					
35	Ethylbenzene	460	5.0	µg/L					
			2.5	µg/L					

Reporting Limits were increased due to high concentrations of target analytes.

*No Benzene was observed above an estimated reporting limit of 1.3 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-06A
Client I.D. Number: 21503-MW02

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND UJ	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	116		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND -- Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

5/4/05
Report Date

6/7/05

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-07A
Client I.D. Number: 21503-MW03

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND UJ	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	111		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	99		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	113		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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5/4/05
Report Date

6/7/05

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: DO102

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05042126-08A
Client I.D. Number: 21503-MW04

Sampled: 04/19/05
Received: 04/21/05
Analyzed: 04/25/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND UJ	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
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16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND UJ	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	112		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	1.0	µg/L	63	Surr: 4-Bromofluorobenzene	111		%REC
29	1,3-Dichloropropane	ND	0.50	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	1.0	µg/L					
32	Tetrachloroethene	ND	4.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	1.0	µg/L					
			0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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5/4/05
Report Date

6/7/05

LDC #: 13540B1
SDG #: 05042126
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 5/01/05
Page: 1 of 1
Reviewer: FT
2nd Reviewer: f

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/19/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	% RSD, r^2 ≥ 0.990
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation. not reported
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3 + 4
XVII.	Field blanks	ND	TB = 1 FB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	21503-QCTB	11	MBLK MS 10W0425	A		31	
2	21503-QCFB	12		22		32	
3	21503-MW01 D	13		23		33	
4	21503-MW01D D	14		24		34	
5	21503-MW02	15		25		35	
6	21503-MW03**	16		26		36	
7	21503-MW04 **	17		27		37	
8	21503-MW04MS	18		28		38	
9	21503-MW04MSD	19		29		39	
10		20		30		40	

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) > 0.05?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 13540B1
SDG #: 050421 26

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?			✓	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?			✓	
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?			✓	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			

LDC #: 13540B1
SDG #: 0504216

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL.
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM.
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

DC #: 13540B1
DG #: 05042126

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? $r^2 \geq 0.990$
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	4/19/05	8260 ICAL	P		0.04643 *	All + BLK	J/UJ/A
r^2			~~KKK~~	33.2 P1		↓	↓
r^2			~~MMM~~	34.6 P1			

* R.L > than the lowest conc. of std INICAL

DC #: 1354081
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: B
2nd Reviewer: B

METHOD: GC/MS VOA (EPA SW 846 Method 8260)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	4/25/05	05042504-CCV	B	27.9		All + BLK	J/UJ/A
			P		0.044 *	↓	↓

* good response

LDC #: 13540B1
SDG #: 0 5042126

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		CCV was also reported as LCS		( )	( )	( )	All	none/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC#: 13540B1
SDG#: 05042126

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)
Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD	
	3	4		
m,p-Xylene	86	96	11	
o-Xylene	5.4	5.5	2	
isopropylbenzene	42	45	7	
n-Propylbenzene	120	140	15	
1,3,5-Trimethylbenzene	48	54	12	
1,2,4-Trimethylbenzene	220	250	13	
sec-Butylbenzene	12	13	8	
n-Butylbenzene	18	19	5	
naphthalene	260	300	14	

V:\FIELD DUPLICATES\13540B1.wpd

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (8 std)	Recalculated RRF (8 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	8260ICA	4/19/05	~~Methylene chloride~~ Vinyl chloride (1st internal standard)	0.4921	0.4921	0.4548	0.4548	11.9	11.9
			~~Trichlorethene~~ EE (2nd internal standard)	1.109	1.109	1.090	1.090	13.7	13.7
			~~Toluene~~ Naphthalene (3rd internal standard)	0.4935	0.4935	0.5041	0.5041	34.6	34.6
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05042504	4/25/05	~~Methylene chloride~~ Vinyl chloride (1st internal standard)	0.455	0.411	0.411	9.7	9.7
			~~Trichlorethene~~ Ethyl Benzene (2nd internal standard)	1.090	1.064	1.064	2.4	2.4
			~~Toluene~~ Naphthalene (3rd internal standard)	0.504	0.565	0.565	12.1	12.1
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B1
SDG #: 0504226

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: B
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 7

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	20.0	97.80	98	98	0
Bromofluorobenzene	↓	111.25	111	111	↓
1,2-Dichloroethane-d4		111.60	112	112	
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: R
2nd Reviewer: R

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 8 + 9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	50.0	50.0	0	50.7	45.6	101	101	91	91	10.6	10.6
Trichloroethene	↓	↓	↓	45.9	43.3	92	92	87	87	5.9	5.8
Benzene				47.4	45.0	95	95	90	90	5.3	5.2
Toluene				46.5	44.0	93	93	88	88	5.6	5.5
Chlorobenzene				47.8	47	96	96	94	94	1.6	1.8

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboraotry control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS MS10W0425A

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	10.0	NA	9.96	NA	99.6	99.6				
Trichloroethene			8.95		90.0	90.0				
Benzene			9.40		94.0	94.0				
Toluene			9.56		96.0	96.0				
Chlorobenzene			9.63		96	96	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LCSCLC.1SB

LDC #: 13540B1
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. _____, _____:

Conc. = $\frac{(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)(\quad)}$

= all ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

MCB Camp Pendleton, CTO 102
Data Validation Reports
LDC# 13540

Volatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: April 19, 2005

LDC Report Date: June 7, 2005

Matrix: Water

Parameters: Total Petroleum Hydrocarbons as Purgeables

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): 05042126

Sample Identification

21503-QCEB
21503-MW01
21503-MW01D
21503-MW02
21503-MW03
21503-MW04**
21503-MW04MS
21503-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Total Petroleum Hydrocarbons as Purgeables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as purgeable contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
21503-MW04MS/MSD (21503-MW04**)	TPH as purgeables	-	-	12.6 (≤12)	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG 05042126	TPH as purgeables	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 21503-MW01 and 21503-MW01D were identified as field duplicates. No total petroleum hydrocarbons as purgeables were detected in any of the samples.

XVII. Field Blanks

Sample 21503-QCEB was identified as an equipment blank. No total petroleum hydrocarbons as purgeable contaminants were found in this blank.

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Purgeables - Data Qualification Summary - SDG 05042126

SDG	Sample	Compound	Flag	A or P	Reason
05042126	21503-MW04**	TPH as purgeables	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
05042126	21503-QCEB 21503-MW01 21503-MW01D 21503-MW02 21503-MW03 21503-MW04**	TPH as purgeables	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Purgeables - Laboratory Blank Data Qualification Summary - SDG 05042126

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 04/21/05

Job#: DO102

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
~~Client ID :~~	~~21503-QCEB~~						
Lab ID :	BMI05042126-03A	TPH Purgeable	ND		0.050 mg/L	04/19/05	04/26/05
		Surr: 1,2-Dichloroethane-d4	111		%REC	04/19/05	04/26/05
		Surr: Toluene-d8	99		%REC	04/19/05	04/26/05
		Surr: 4-Bromofluorobenzene	111		%REC	04/19/05	04/26/05
Client ID :	**21503-MW01**						
Lab ID :	BMI05042126-04A	TPH Purgeable	4.1		0.50 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	105		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	92		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	100		%REC	04/19/05	04/25/05
Client ID :	**21503-MW01D**						
Lab ID :	BMI05042126-05A	TPH Purgeable	4.0		0.50 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	106		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	95		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	101		%REC	04/19/05	04/25/05
Client ID :	**21503-MW02**						
Lab ID :	BMI05042126-06A	TPH Purgeable	ND	O	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	106		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	93		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	116		%REC	04/19/05	04/25/05
Client ID :	**21503-MW03**						
Lab ID :	BMI05042126-07A	TPH Purgeable	ND	O	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	111		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	99		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	113		%REC	04/19/05	04/25/05
Client ID :	**21503-MW04**						
Lab ID :	BMI05042126-08A	TPH Purgeable	ND	O UJ	0.10 mg/L	04/19/05	04/25/05
		Surr: 1,2-Dichloroethane-d4	112		%REC	04/19/05	04/25/05
		Surr: Toluene-d8	98		%REC	04/19/05	04/25/05
		Surr: 4-Bromofluorobenzene	111		%REC	04/19/05	04/25/05

6/7/06

LDC #: 13540B7

SDG #: 05042126

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 6/2/05

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC TPH as Gasoline (EPA SW846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/19/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	noncac RRF/mm SPCC
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation. not reported
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 2 + 3
XVII.	Field blanks	ND	EB = 1

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; N = Not provided/applicable; R = Rinsate; TB = Trip blank; SW = See worksheet; FB = Field blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation Water

1	21503-QCEB	11	MBLK MS1 OWD 425B	21		31	
2	21503-MW01 D	12		22		32	
3	21503-MW01D D	13		23		33	
4	21503-MW02	14		24		34	
5	21503-MW03	15		25		35	
6	21503-MW04**	16		26		36	
7	21503-MW04MS	17		27		37	
8	21503-MW04MSD	18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?				
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?				
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?			✓	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?			✓	
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?			✓	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓	✓	✓	
Target compounds were detected in the field duplicates.		✓	✓	

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: 9

Validation Area	Yes	No	NA	Findings/Comments
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: B
2nd Reviewer: S

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7+8	TPH purgeable	( )	( )	12.6 (12)	6	J/UJ/A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 13540B7
SDG #: 0504216

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: M
2nd Reviewer: S

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		CCV was	also	reported	and LCS	( )	All	none/p
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 1354087
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: B
2nd Reviewer: R

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (400 std)	Recalculated RRF (400 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	TPH Purgeable	4/19/05	~~Methylene chloride~~ TPH purgeable (1st internal standard)	1.744	1.744	1.764	1.764	5.0	5.0
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: B
2nd Reviewer: Q

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05042503	4/25/05	~~Methylene chloride~~ TPH Purgeable (1st internal standard)	1.764	1.796	1.796	1.8	1.8
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: B
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #6

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	20	19.56	98	98	0
Bromofluorobenzene	↓	22.25	111	111	↓
1,2-Dichloroethane-d4		22.32	112	112	
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 13540B7
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 7 & 8

Compound	Spike Added (mg/L)		Sample Concentration (mg/L)	Spiked Sample Concentration (mg/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-----	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
TPH Purgeable ~~1,1-Dichloroethene~~	2	2	0	2.3	2.03	115	115	102	102	12.6	12.5
Trichloroethene											
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLC.1SB

LDC #: 1354087
SDG #: 05042126

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: B
2nd Reviewer: G

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboraotry control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: GLCS MS10W0425B

Compound	Spike Added (mg/L)		Spiked Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
TPH purgeable ~~1,1-Dichloroethene~~	0.4	NA	0.378		94	94	NA			
Trichloroethene										
Benzene										
Toluene										
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13540B7
SDG #: 09042126

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 6 of 1
Reviewer:
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. _____, _____:

Conc. = (_____)(_____)(_____) / (_____)(_____)(_____)(_____)

= all ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

MCB Camp Pendleton, CTO 102
Data Validation Reports
LDC# 13540

TPH as Purgeables

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Battelle
505 King Ave
Columbus, OH 43201-2693
ATTN: Mr. Dave Clexton

June 7, 2005

SUBJECT: MCB Camp Pendleton, Data Validation

Dear Mr. Clexton,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 25, 2005. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 13540:

SDG #	Fraction
05041503, 05042126	Volatiles, Lead & Dissolved Manganese, Wet Chemistry, TPH as Gasoline

The data validation was performed under EPA Level III and Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

V:\LOGIN\Battelle\Pendleton\13540COV.wpd

Attachment 1

LDC #13540 (Battelle-Columbus OH / MCB Camp Pendleton, CTO 102)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Diss. Mn (6020)		Pb (6020)		TPH-G (8015)		Alk. (310.1)		NO_3-N NO_2-N (300.0)		SO_4 (300.0)		TDS (160.1)		Fe II (3500)																	
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	05041503	05/25/05	06/16/05	-	-	1	0	1	0	-	-	1	0	1	0	1	0	1	0	1	0																
A	05041503	05/25/05	06/16/05	-	-	1	0	1	0	-	-	1	0	1	0	1	0	1	0	1	0																
B	05042126	05/25/05	06/16/05	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-																
B	05042126	05/25/05	06/16/05	1	0	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-																
Total	B/LR			7	0	2	0	2	0	6	0	2	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27

Shaded cells indicate Level IV validation (all other cells are Level III validation).

13540ST.wpd

ATTACHMENT 1

RWQCB COMMENTS ON SITE 21503 AND NAVY RESPONSES

California Regional Water Quality Control Board

San Diego Region

Terry Tamminen
Secretary for Environmental Protection

9174 Sky Park Court, Suite 100, San Diego, California 92123-4340
(858) 467-2952 • Fax (858) 571-6972
http://www.swrcb.ca.gov/rwqcb9

Arnold Schwarzenegger
Governor

June 10, 2004

In reply refer to:
SMC:[illegible]0-2832.05:peurp

T.L. Sahagun.
Acting RCRA Management Division Head
Assistant Chief of Staff
Environmental Security
United States Marine Corps
PO Box 555008, Building 22165
Camp Pendleton, CA 92055-5008

Dear Ms. Sahagun:

SUBJECT: Final Site Assessment Report and Addendum to the Site Assessment Report (by Batelle) for Underground Storage Tank Site 21503, Project No. 5090.13c, Marine Corps Base, Camp Pendleton, California

The above-referenced report discusses the findings of an investigation that was intended to define the extent of soil and groundwater contamination in the vicinity of a 12,000-gallon underground storage tank. The tank had been used to store gasoline. Soil sampling that was performed during the tank removal revealed relatively minor impacts in the general area of the tank. However, sampling during a subsequent phase of investigation revealed that a Total Petroleum Hydrocarbon (as gasoline or TPH-g) concentration of 1,600 mg/kg was present at about 10 feet below ground surface (bgs). When well MW-1 was installed in this area, a TPH-g concentration of 15,000 micrograms per liter (ug/l) was found in groundwater. However, three wells surrounding MW-1 yielded water samples with non-detectable levels of petroleum hydrocarbon contaminants. It is also noteworthy that benzene and methyl tert-butyl ether were not detected in any wells, including MW-1. Based on this data, the report recommends no further action. Please note, however, the following points.

- Site 21503 is located about 700 feet from the Boat Basin (i.e., within 1,000 feet of the Boat Basin). The Boat Basin is an inlet of the Pacific Ocean and is therefore classified as marine waters. As such, the Regional Board's "Low Risk Guidance" is applicable at Site 21503.

- According to the "Low Risk Guidance", the water quality goal for ethylbenzene is 430 ug/l. An ethylbenzene concentration of 1,600 ug/l was detected at well MW-1 during the first round of monitoring.

- In general, wells are installed in order to gauge long-term water quality. It is important to evaluate trends in water quality and also to account for temporal changes in water quality that occur as the result of seasonal effects. For example, water table fluctuation is often influenced by rainfall. One round of sampling does not supply sufficient data to assess trends or seasonal variability.

Based on the foregoing factors, it is necessary to continue to monitor water quality at Site 21503. Please observe the following requirements.

1. Wells should be monitored on a quarterly basis for a period of one year. At the end of the year a decision will be made as to whether closure is warranted. Alternatively, continued monitoring or site remediation may be required, depending on monitoring results. In the event that monitoring data shows that the plume is contained and restricted to a small area, it may be possible to close the site even if the water quality goal for ethylbenzene is exceeded.

2. Water samples should be tested for TPH as gasoline and for VOCs using EPA Method 8260B.

3. Prior to the last round of quarterly sampling (anticipated to take place in the summer of 2005) at least 72 hours notice should be provided to the Regional Board. A Board representative may be present to witness water sampling activities.

4. Please perform the first round of monitoring before **August 31, 2004**.

The heading portion of this letter includes a Regional Board code number noted after "In reply refer to:" In order to assist us in the processing of your correspondence please include this code number in the heading or subject line portion of all correspondence and reports to the Regional Board pertaining to this matter.

If you have any questions please contact me at (858) 637-7137.

Sincerely,

Peter Peuron

Peter Peuron
Environmental Scientist

PMP:jpa:pmp 21503 Resp to SAR 6 04

RWQCB Code Number SMC:50-2832.05:peurp

MCB Camp Pendleton Final Site Assessment Report UST Site 21503 **Review and Comment Form**				
Document Title: Final Site Assessment Report for Former UST Site 21503, Marine Corps Base Camp Pendleton			**Lead Authors:** Chris Zimmerman and David Clexton	
Contract No. N47408-01-8207			**Document Date:** December 5, 2003	
From	**No.**	**Page and Paragraph**	**Comment**	**Response to Comment**
P. Peuron (RWQCB)	1	General	The above-referenced report discusses the findings of an investigation that was intended to define the extent of soil and groundwater contamination in the vicinity of a 12,000-gallon underground storage tank. The tank had been used to store gasoline. Soil sampling that was performed during the tank removal revealed relatively minor impacts in the general area of the tank. However, sampling during a subsequent phase of investigation revealed that a Total Petroleum Hydrocarbon (as gasoline or TPH-g) concentration of 1,600 mg/kg was present at about 10 feet below ground surface (bgs). When well MW-1 was installed in this area, a TPH-g concentration of 15,000 micrograms per liter (µg/L) was found in groundwater. However, three wells surrounding MW-1 yielded water samples with non-detectable levels of petroleum hydrocarbon contaminants. It is also noteworthy that benzene and methyl tert-butyl ether were not detected in any wells, including MW-1. Based on this data, the report recommends no further action. Please note, however, the following points. • Site 21503 is located about 700 feet from the Boat Basin (i.e., within 1,000 feet of the Boat Basin). The Boat Basin is an inlet of the Pacific Ocean and is therefore classified as marine waters. As such, the Regional Board's "Low Risk Guidance" is applicable at Site 21503. • According to the "Low Risk Guidance", the water quality goal for ethylbenzene is 430 µg/L. An ethylbenzene concentration of 1,600 µg/L was detected at well MW-1 during the first round of monitoring.	Comment Noted.

MCB Camp Pendleton Final Site Assessment Report UST Site 21503

Review and Comment Form

Document Title: Final Site Assessment Report for Former UST Site 21503, Marine Corps Base Camp Pendleton	**Lead Authors:** Chris Zimmerman and David Clexton
Contract No. N47408-01-8207	**Document Date:** December 5, 2003

From	No.	Page and Paragraph	Comment	Response to Comment
P. Peuron	1	General (cont'd)	• In general, wells are installed in order to gauge long-term water quality. It is important to evaluate trends in water quality and also to account for temporal changes in water quality that occur as the result of seasonal effects. For example, water table fluctuation is often influenced by rainfall. One round of sampling does not supply sufficient data to assess trends or seasonal variability.	
P. Peuron	2	General	Based on the foregoing factors, it is necessary to continue to monitor water quality at Site 21503. Please observe the following requirements. 1) Wells should be monitored on a quarterly basis for a period of one year. At the end of the year, a decision will be made as to whether closure is warranted. Alternatively, continued monitoring or site remediation may be required, depending on monitoring results. In the event that monitoring data shows that the plume is contained and restricted to a small area, it may be possible to close the site even if the water quality goal for ethylbenzene is exceeded. 2) Water samples should be tested for TPH as gasoline and for VOCs using EPA Method 8260B. 3) Prior to the last round of quarterly sampling (anticipated to take place in the summer of 2005) at least 72 hours notice should be provided to the Regional Board. A Board representative may be present to witness water sampling activities. 4) Please perform the first round of monitoring before **August 31, 2004**.	Monitoring wells 21503-MW01 through 21503-MW04 will be monitored on a quarterly basis for a period of one year. Water samples from each well will be analyzed for TPH-G (8015B) and VOCs (8260B). Monitoring will begin prior to August 31, 2004. A brief report summarizing the results of the water sampling activities will be provided to RWQCB following the four quarterly monitoring events. Prior to the last monitoring event, the RWQCB will be contacted at least 72 hours prior to sampling to allow for a Board representative to be present during the field effort if desired.