COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901679
Date Collected : 05/18/09
Date Received : 05/18/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-26-2	P0901679-001	0.010	0.003	1	NA	05/18/09 13:10	ND	
MW-26-1	P0901679-002	0.010	0.003	1	NA	05/18/09 13:10	ND	
EB-15-05/18/09	P0901679-003	0.010	0.003	1	NA	05/18/09 13:10	ND	
Method Blank	P0901679-MB	0.010	0.003	1	NA	05/18/09 13:10	ND	

Approved By KMH Date : 05/20/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901646

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

June 9, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 14, 2009. One of the samples was sent out for partial analysis to our Kelso facility. Please find their report attached. For your reference, these analyses have been assigned our service request number P0901646.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 181 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901646
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 14, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

1,4-Dioxane by EPA Method 8270C SIM Modified

No anomalies were encountered during this analysis.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901646

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901646-001	MW-4-5	5/14/09	08:34
P0901646-002	MW-4-4	5/14/09	09:04
P0901646-003	MW-4-3	5/14/09	09:34
P0901646-004	MW-4-2	5/14/09	10:06
P0901646-005	MW-4-1	5/14/09	10:43
P0901646-006	EB-14-5/14/09	5/14/09	10:28

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company
2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No: P0901646

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 2009
Project Manager	**Project Number**
DAVID CONNER	G4466090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (7199)	0 Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-4-5	1	5/14/09	0834	W	1							X			
MW-4-4	2		0904									X			
MW-4-3	3		0934									X			
MW-4-2	4		1006		1							X			QC LEVEL III
MW-4-1	5		1043		4							X	X	X	
EB-14-5/14/09	6		1028		1							X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 5/14/09	Time: 1230	Received by: (Signature)	Date: 5/14/09	Time: 1230
Relinquished by: (Signature)	Date: 5/14/09	Time: 13:20	Received by: (Signature)	Date: 5/14/09	Time: 1320
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 4 °C

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901646

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/14/09 Date opened: 05/14/09 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 4 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901646-001.01	125mL Plastic NP					
P0901646-002.01	125mL Plastic NP					
P0901646-003.01	125mL Plastic NP					
P0901646-004.01	125mL Plastic NP					
P0901646-005.01	1000ml AG NP					
P0901646-005.02	1000ml AG NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901646

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/14/09 Date opened: 05/14/09 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901646-005.03	125mL Plastic NP					
P0901646-005.04	500mL AG NP					
P0901646-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

1,4 – Dioxane

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **Battelle**
Client Project ID: **JPL GW Mon 2Q09 / G486090** CAS Project ID: P0901646

1,4-Dioxane

Test Code:	EPA 8270C SIM Modified	Date(s) Collected:	5/14/09
Instrument ID:	HP5971A/HP5890 II/MS1	Date Received:	5/14/09
Analyst:	Hani Cherazaie	Date Extracted:	5/20/09
Matrix:	Water	Date Analyzed:	5/21/09
Test Notes:		Final Extract Volume:	1.0 ml(s)

Client Sample ID	CAS Sample ID	Dilution Factor	Sample Volume Liter(s)	**Result µg/L**	MRL µg/L	MDL µg/L	Data Qualifier
MW-4-1	P0901646-005	1.0	0.10	ND	0.50	0.21	
Method Blank	P090520-MB	1.0	0.10	ND	0.50	0.21	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 6/3/09

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901646
Date Collected : 05/14/09
Date Received : 05/14/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-4-5	P0901646-001	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-4	P0901646-002	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-3	P0901646-003	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-2	P0901646-004	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-1	P0901646-005	0.010	0.003	1	NA	05/14/09 15:40	ND	
EB-14-5/14/09	P0901646-006	0.010	0.003	1	NA	05/14/09 15:40	ND	
Method Blank	P0901646-MB	0.010	0.003	1	NA	05/14/09 15:40	ND	

Approved By Karen Rya Date : 5/15/09

Report By:SAnderson

DIVIDER SHEET

CAS-KELSO REPORT

1317 South 13th Avenue Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

May 26, 2009 Analytical Report for Service Request No: P0901646

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on May 14, 2009. For your reference, these analyses have been assigned our service request number P0901646.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3280. You may also contact me via Email at LKennedy@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Les Kennedy
Project Chemist

LK/rh

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Battelle	**Service Request No.:**	P0901646
Project:	JPL GW Mon 2Q09	**Date Received:**	5/14/09
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One water sample received for analysis at Columbia Analytical Services, Simi Valley laboratory on 5/14/09 was forwarded and received in the Kelso laboratory on 5/15/09 in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Nitrosamines by EPA Method 521

No anomalies associated with the analysis of this batch were observed.

Approved by UL **Date** 5/20/09

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Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

CAS Contact: Sue Anderson

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Project Name: JPL GW Mon 2Q09
Project Number: G486090
Project Manager: David Conner
Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Nitrosamines 521
P0901646-005	MW-4-1	2	Water	5/14/09	1043	5/14/09	KELSO	III

Test Comments

Nitrosamines - 521 P0901646-005 NDMA

Folder Comments:

Note: EDF files for client's internal data base;LogCode is BAT, do not have Global ID. EDD & pdf of report sent to Betsy Cutie (cutiee@battelle.org) via file share site https://fx.battelle.org. For EDF unique spike ids (ex: P0701XXX01MS or SD).

Special Instructions/Comments	Turnaround Requirements	Report Requirements	Invoice Information
	____RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 X STANDARD Requested FAX Date: _____ Requested Report Date: 05/31/09	___ I. Results Only ___ II. Results + QC Summaries X III. Results + QC and Calibration Summaries FULL DATA PACKAGE ___ IV. Data Validation Report with Raw Data PQL/MDL/J Y EDD Y	PO# P0901646 Bill to

Relinquished By: [signature] 5/14/09 14:10

Received By: Kimberly Smith 5/15/09 1000

Airbill Number: _____

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC LCS

Client / Project: Simi Valley Service Request ~~K09~~ P0901646

Received: 5-15-09 Opened: 5-15-09 By: Brad

1. Samples were received via? *US Mail* *Fed Ex* *(UPS)* *DHL* *GH* *GS* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *(Cooler)* *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: 1Z78905X,3414566602 NA (Y) N
5. **Temperature of cooler(s) upon receipt (°C):** 4.2
   Temperature Blank (°C): N/A
   Thermometer ID: 273
6. If applicable, list Chain of Custody Numbers:
7. Packing material used. *Inserts* *Baggies* *(Bubble Wrap)* *(Gel Packs)* *(Wet Ice)* *Sleeves* *Other* ______
8. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
9. **Did all bottles arrive in good condition (unbroken)?** *Indicate in the table below.* NA (Y) N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
11. Did all sample labels and tags agree with custody papers? *Indicate in the table below* NA (Y) N
12. **Were appropriate bottles/containers and volumes received for the tests indicated?** NA (Y) N
13. Were the pH-preserved bottles tested* received at the appropriate pH? *Indicate in the table below* (NA) Y N
14. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** (NA) Y N
16. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

**Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).*

Additional Notes, Discrepancies, & Resolutions: ______

Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901646

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-4-1	P0901646-005	05/14/2009	05/14/2009

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Lorna E Portwood Name: Lorna Portwood

Date: 5/12/09 Title: Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P0901646
Project:	JPL GW Mon 2Q09/G486090	**Date Collected:**	05/14/2009
Sample Matrix:	Water	**Date Received:**	05/14/2009

Nitrosamines by EPA 521

Sample Name:	MW-4-1	**Units:**	ng/L
Lab Code:	P0901646-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	**0.74**	J	2.0	0.54	1	05/15/09	05/16/09	KWG0904110	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	87	70-130	05/16/09	Acceptable

Comments:

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901627

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 14, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 13, 2009. For your reference, these analyses have been assigned our service request number P0901627.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901627
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 13, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901627

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901627-001	MW-23-5	5/13/09	08:15
P0901627-002	MW-23-4	5/13/09	08:47
P0901627-003	MW-23-3	5/13/09	09:37
P0901627-004	MW-23-2	5/13/09	10:04
P0901627-005	MW-23-1	5/13/09	10:41
P0901627-006	EB-13-05/13/09	5/13/09	10:23

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No: 1290182-7

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW. MON. 2Q09
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319/ BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: 619-726-7311 / Fax:	
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 NDMA (1625-0)	Remarks
MW-23-5	1	5/13/09	0815	W	1							X			
MW-23-4	2	"	0847	"	2							X			MS/MSD
MW-23-3	3	"	0937	"	1							X			
MW-23-2	4	"	1004	"	"							X			
MW-23-1	5	"	1041	"	"							X			QC LEVEL IV
EB-13-05/13/09	6	"	1023	"	1							X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____ Tier III - (Data Validation Package) 10% Surcharge ____ MRL required Yes / No EDD required Yes / No

Tier II - (Results + QC) ____ Tier V - (client specified) ____ MDL / PQL / J required Yes / No Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 5/13/09	Time: 1200	Received by: (Signature)		Date: 5/13/09	Time: 12:00	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date: 5/13/09	Time: 12:45	Received by: (Signature)		Date: 5/13/09	Time: 1245	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		Date:	Time:	Temperature °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901627

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901627-001.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-002.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-002.02					
		5/13/09	1321	SMO / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-003.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-004.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-005.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-006.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901627

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/13/09 Date opened: 05/13/09 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901627-001.01	125mL Plastic NP					
P0901627-002.01	125mL Plastic NP					
P0901627-002.02	125mL Plastic NP					
P0901627-003.01	125mL Plastic NP					
P0901627-004.01	125mL Plastic NP					
P0901627-005.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901627

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/13/09 Date opened: 05/13/09 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901627-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901627
Date Collected : 05/13/09
Date Received : 05/13/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-5	P0901627-001	0.010	0.003	1	NA	05/13/09 13:55	ND	
MW-23-4	P0901627-002	0.010	0.003	1	NA	05/13/09 13:55	ND	
MW-23-3	P0901627-003	0.010	0.003	1	NA	05/13/09 13:55	ND	
MW-23-2	P0901627-004	0.010	0.003	1	NA	05/13/09 13:55	ND	
MW-23-1	P0901627-005	0.010	0.003	1	NA	05/13/09 13:55	ND	
EB-13-05/13/09	P0901627-006	0.010	0.003	1	NA	05/13/09 13:55	ND	
Method Blank	P0901627-MB	0.010	0.003	1	NA	05/13/09 13:55	ND	

Approved By Karen Ryza Date : 5/14/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901610

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Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 13, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 12, 2009. For your reference, these analyses have been assigned our service request number P0901610.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle
Project: JPL GW Mon 2Q09 / G486090

CAS Project No: P0901610

CASE NARRATIVE

The samples were received intact under chain of custody on May 12, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901610

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901610-001	MW-11-5	5/12/09	08:37
P0901610-002	MW-11-4	5/12/09	09:29
P0901610-003	MW-11-3	5/12/09	10:26
P0901610-004	MW-11-2	5/12/09	10:54
P0901610-005	MW-11-1	5/12/09	11:37
P0901610-006	EB-12-05/12/09	5/12/09	11:17

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
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MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Page 1 of 1

Columbia Analytical Services INC.
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Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 9090161C

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 2Q09
Project Manager	**Project Number**
DAVID CONNELL	G4860 90
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-11-5	1	5/12/09	0837	W	1						X			
MW-11-4	2	"	0929	"	2						X			MS/MSD
MW-11-3	3	"	1026	"	1						X			
MW-11-2	4	"	1054	"	"						X			
MW-11-1	5	"	1132	"	"						X			QC LEVEL IV
EB-12-05/12/09	6	"	1117	"	1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/12/09	1230			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/12/09	1345		5/13/09	1345
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901610

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901610-001.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-002.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-002.02					
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-003.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-004.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-005.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-006.01					
	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901610

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/12/09 Date opened: 05/12/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901610-001.01	125mL Plastic NP					
P0901610-002.01	125mL Plastic NP					
P0901610-002.02	125mL Plastic NP					
P0901610-003.01	125mL Plastic NP					
P0901610-004.01	125mL Plastic NP					
P0901610-005.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901610

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/12/09 Date opened: 05/12/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901610-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901610
Date Collected : 05/12/09
Date Received : 05/12/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-11-5	P0901610-001	0.010	0.003	1	NA	05/12/09 14:55	ND	
MW-11-4	P0901610-002	0.010	0.003	1	NA	05/12/09 14:55	ND	
MW-11-3	P0901610-003	0.010	0.003	1	NA	05/12/09 14:55	ND	
MW-11-2	P0901610-004	0.010	0.003	1	NA	05/12/09 14:55	ND	
MW-11-1	P0901610-005	0.010	0.003	1	NA	05/12/09 14:55	ND	
EB-12-05/12/09	P0901610-006	0.010	0.003	1	NA	05/12/09 14:55	ND	
Method Blank	P0901610-MB	0.010	0.003	1	NA	05/12/09 14:55	ND	

Approved By Karen Ryan Date : 5/12/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901578

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 12, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 11, 2009. For your reference, these analyses have been assigned our service request number P0901578.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901578
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 11, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901578

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901578-001	MW-19-5	5/11/09	08:42
P0901578-002	MW-19-4	5/11/09	09:13
P0901578-003	MW-19-3	5/11/09	10:15
P0901578-004	MW-19-2	5/11/09	10:45
P0901578-005	MW-19-1	5/11/09	11:22
P0901578-006	DUPE-08-2Q09	5/11/09	00:00
P0901578-007	EB-11-5/11/09	5/11/09	11:07

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 10-6575

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 2Q09
	Project Number: 64486090
Project Manager: DAVID CONNETT	P.O. # / Billing Information: 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: 619-726-7311	Fax:
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-19-5	1	5/11/09	0842	W								X			
MW-19-4	2		0913									X			
MW-19-3	3		1015									X			
MW-19-2	4		1045									X			QC LEVEL III
MW-19-1	5		1122									X			
DUPE-05-2009	6		—									X			DUPLICATE
EB-11-5/11/09	7		1107									X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC)
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/11/09	1230		5/11/09	12:30
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/11/09	13:40		5/11/09	13:40
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature ____ °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901578

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901578-001.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-002.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-003.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-004.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-005.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-006.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-007.01					
	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle — Work order: P0901578

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/11/09 — Date opened: 05/11/09 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 4 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901578-001.01	125mL Plastic NP					
P0901578-002.01	125mL Plastic NP					
P0901578-003.01	125mL Plastic NP					
P0901578-004.01	125mL Plastic NP					
P0901578-005.01	125mL Plastic NP					
P0901578-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901578

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/11/09 Date opened: 05/11/09 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901578-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901578
Date Collected : 05/11/09
Date Received : 05/11/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-19-5	P0901578-001	0.010	0.003	1	NA	05/11/09 16:25	ND	
MW-19-4	P0901578-002	0.010	0.003	1	NA	05/11/09 16:25	ND	
MW-19-3	P0901578-003	0.010	0.003	1	NA	05/11/09 16:25	ND	
MW-19-2	P0901578-004	0.010	0.003	1	NA	05/11/09 16:25	ND	
MW-19-1	P0901578-005	0.010	0.003	1	NA	05/11/09 16:25	ND	
DUPE-08-2Q09	P0901578-006	0.010	0.003	1	NA	05/11/09 16:25	ND	
EB-11-5/11/09	P0901578-007	0.010	0.003	1	NA	05/11/09 16:25	ND	
Method Blank	P0901578-MB	0.010	0.003	1	NA	05/11/09 16:25	ND	

Approved By Karen Rya Date : 5/12/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901551

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 11, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 7, 2009. For your reference, these analyses have been assigned our service request number P0901551.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901551
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 7, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901551

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901551-001	MW-12-5	5/7/09	08:35
P0901551-002	MW-12-4	5/7/09	09:07
P0901551-003	MW-12-3	5/7/09	09:50
P0901551-004	MW-12-2	5/7/09	10:35
P0901551-005	MW-12-1	5/7/09	11:07
P0901551-006	DUPE-07-2Q09	5/7/09	00:00
P0901551-007	EB-10-5/07/09	5/7/09	10:51

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P090155 1

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON. 2Q09

Project Number
64486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319/ BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
614-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-12-5	1	5/07/09	0835	W	1							X			QC LEVEL IV
MW-12-4	2		0907									X			
MW-12-3	3		0950									X			
MW-12-2	4		1035									X			
MW-12-1	5		1107									X			
DUPE-07-2Q09	6		—									X			DUPLICATE
EB-10-5/07/09	7		1051									X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: _____

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	5/07/09	1230	Received by: (Signature)	5/7/09	1230
Relinquished by: (Signature)	5/07/09	1300	Received by: (Signature)	5/7/09	1300
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3 °C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901551

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901551-001.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-002.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-003.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-004.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-005.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-006.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-007.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901551

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/07/09 Date opened: 05/07/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901551-001.01	125mL Plastic NP					
P0901551-002.01	125mL Plastic NP					
P0901551-003.01	125mL Plastic NP					
P0901551-004.01	125mL Plastic NP					
P0901551-005.01	125mL Plastic NP					
P0901551-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide NaOH (pH>12); T. Sulfide NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901551

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/07/09 Date opened: 05/07/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901551-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901551
Date Collected : 05/07/09
Date Received : 05/07/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-5	P0901551-001	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-4	P0901551-002	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-3	P0901551-003	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-2	P0901551-004	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-1	P0901551-005	0.010	0.003	1	NA	05/07/09 15:10	ND	
DUPE-07-2Q09	P0901551-006	0.010	0.003	1	NA	05/07/09 15:10	ND	
EB-10-5/07/09	P0901551-007	0.010	0.003	1	NA	05/07/09 15:10	ND	
Method Blank	P0901551-MB	0.010	0.003	1	NA	05/07/09 15:10	ND	

Approved By Karen Ryan Date : 5/8/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901536

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 7, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 6, 2009. For your reference, these analyses have been assigned our service request number P0901536.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 27 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901536
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 6, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901536

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901536-001	MW-20-5	5/6/09	08:25
P0901536-002	MW-20-4	5/6/09	09:04
P0901536-003	MW-20-3	5/6/09	10:05
P0901536-004	MW-20-2	5/6/09	11:04
P0901536-005	MW-20-1	5/6/09	11:34
P0901536-006	DUPE-05-2Q09	5/6/09	00:00
P0901536-007	DUPE-06-2Q09	5/6/09	00:00
P0901536-008	EB-09-05/06/09	5/6/09	11:20

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
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MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
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NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P090 1536

CAS Contact:

Company Name & Address (Reporting Information)	BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110
Project Name	JPL GW MON. 2009
Project Number	G4K6090
Project Manager	DAVID CONNER
P.O. # / Billing Information	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone	619-726-7311
Fax	
Email Address for Result Reporting	
Sampler (Print & Sign)	

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-20-5	1	5/6/09	0825	W	1						X			QC LEVEL III
MW-20-4	2		0904								X			
MW-20-3	3		1005								X			
MW-20-2	4		1104								X			
MW-20-1	5		1134								X			
DUPE-05-2009	6		—								X			DUPLICATE
DUPE-06-2009	7		—								X			DUPLICATE
EB-09-05/06/09	8		1120		1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 5/6/09	Time: 2:30	Received by: (Signature)		Date: 5/6/09	Time: 2:30	
Relinquished by: (Signature)	Date: 5/6/09	Time: 13:30	Received by: (Signature)		Date: 5/6/09	Time: 1330	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		Date:	Time:	Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901536

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901536-001.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-002.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-003.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-004.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-005.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-006.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1359	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-007.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-008.01					

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Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901536

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1359	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901536

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/06/09 Date opened: 05/06/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901536-001.01	125mL Plastic NP					
P0901536-002.01	125mL Plastic NP					
P0901536-003.01	125mL Plastic NP					
P0901536-004.01	125mL Plastic NP					
P0901536-005.01	125mL Plastic NP					
P0901536-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901536

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/06/09 Date opened: 05/06/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901536-007.01	125mL Plastic NP					
P0901536-008.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901536
Date Collected : 05/06/09
Date Received : 05/06/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-20-5	P0901536-001	0.010	0.003	1	NA	05/06/09 16:15	ND	
MW-20-4	P0901536-002	0.010	0.003	1	NA	05/06/09 16:15	ND	
MW-20-3	P0901536-003	0.010	0.003	1	NA	05/06/09 16:15	ND	
MW-20-2	P0901536-004	0.010	0.003	1	NA	05/06/09 16:15	ND	
MW-20-1	P0901536-005	0.010	0.003	1	NA	05/06/09 16:15	ND	
DUPE-05-2Q09	P0901536-006	0.010	0.003	1	NA	05/06/09 16:15	ND	
DUPE-06-2Q09	P0901536-007	0.010	0.003	1	NA	05/06/09 16:15	ND	
EB-09-05/06/09	P0901536-008	0.010	0.003	1	NA	05/06/09 16:15	ND	
Method Blank	P0901536-MB	0.010	0.003	1	NA	05/06/09 16:15	ND	

Approved By Karen Ryan Date : 5/7/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901522

Table of Contents

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 27, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 5, 2009. One of the samples was sent out for partial analysis to our Kelso facility. Please fine their report attached. For your reference, these analyses have been assigned our service request number P0901522.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 175 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Client: Battelle CAS Project No: P0901522
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on May 5, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

1,4-Dioxane by EPA Method 8270C SIM Modified

No anomalies were encountered during this analysis.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901522

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901522-001	MW-17-5	5/5/09	08:40
P0901522-002	MW-17-4	5/5/09	09:18
P0901522-003	MW-17-3	5/5/09	11:07
P0901522-004	MW-17-2	5/5/09	11:41
P0901522-005	MW-17-1	5/5/09	12:13
P0901522-006	EB-08-5/05/09	5/5/09	11:30

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Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P090522

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON 2009

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319 / BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (7196)	0 1,4-Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-17-5	1	5/05/09	0840	W	1							X			
MW-17-4	2	"	0918	"	8							X	X	X	MS/MSD
MW-17-3	3	"	1107	"	1							X			
MW-17-2	4	"	1141	"	"							X			
MW-17-1	5	"	1213	"	"							X			
EB-08-5/05/09	6	"	1130	"	1							X			

Preservative Key
0 None
1 HCL
2 HNO3
3 H2SO4
4 NaOH
5 Zn Acetate
6 Asc Acid
7 Other

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 5/5/09	Time: 1517	Received by: (Signature)		Date: 5/5/09	Time: 1317
Relinquished by: (Signature)		Date: 5/5/09	Time: 1410	Received by: (Signature)		Date: 5/5/09	Time: 1410
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901522

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901522-001.01					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-002.01					
	521				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
		5/15/09	1244	In Lab / PMULHERIN	
		5/15/09	2346	K-HERK-A4 / PMULHERIN	
P0901522-002.02					
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
P0901522-002.03					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-002.04					
	8270C SIM				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-16 / MZAMORA	
P0901522-002.05					
		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
P0901522-002.06					
		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
		5/15/09	1244	In Lab / PMULHERIN	
		5/15/09	2346	K-HERK-A4 / PMULHERIN	
P0901522-002.07					
		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901522

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901522-002.08					
		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1421	P-16 / MZAMORA	
P0901522-003.01					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-004.01					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-005.01					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-006.01					
	7196A				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901522

Project: JPL GW MON 2Q09 / G486090

Sample(s) received on: 05/05/09 Date opened: 05/05/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901522-001.01	125mL Plastic NP					
P0901522-002.01	1000ml AG NP					
P0901522-002.02	1000ml AG NP					
P0901522-002.03	125mL Plastic NP					
P0901522-002.04	500mL AG NP					
P0901522-002.05	1000ml AG NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901522

Project: JPL GW MON 2Q09 / G486090

Sample(s) received on: 05/05/09 Date opened: 05/05/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901522-002.06	1000ml AG NP					
P0901522-002.07	125mL Plastic NP					
P0901522-002.08	500mL AG NP					
P0901522-003.01	125mL Plastic NP					
P0901522-004.01	125mL Plastic NP					
P0901522-005.01	125mL Plastic NP					
P0901522-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

1,4 – Dioxane

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **Battelle**
Client Project ID: **JPL GW Mon 2Q09 / G486090** CAS Project ID: P0901522

1,4-Dioxane

Test Code:	EPA 8270C SIM Modified	Date(s) Collected:	5/5/09
Instrument ID:	HP5971A/HP5890 II/MS1	Date Received:	5/5/09
Analyst:	Hani Cherazaie	Date Extracted:	5/11/09
Matrix:	Water	Date Analyzed:	5/11/09
Test Notes:		Final Extract Volume:	1.0 ml(s)

Client Sample ID	CAS Sample ID	Dilution Factor	Sample Volume Liter(s)	Result µg/L	MRL µg/L	MDL µg/L	Data Qualifier
MW-17-4	P0901522-002	1.0	0.10	ND	0.50	0.21	
Method Blank	P090511-MB	1.0	0.10	ND	0.50	0.21	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/26/09

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901522
Date Collected : 05/05/09
Date Received : 05/05/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-17-5	P0901522-001	0.010	0.003	1	NA	05/05/09 15:10	ND	
MW-17-4	P0901522-002	0.010	0.003	1	NA	05/05/09 15:10	ND	
MW-17-3	P0901522-003	0.010	0.003	1	NA	05/05/09 15:10	ND	
MW-17-2	P0901522-004	0.010	0.003	1	NA	05/05/09 15:10	ND	
MW-17-1	P0901522-005	0.010	0.003	1	NA	05/05/09 15:10	ND	
EB-08-5/05/09	P0901522-006	0.010	0.003	1	NA	05/05/09 15:10	ND	
Method Blank	P0901522-MB	0.010	0.003	1	NA	05/05/09 15:10	ND	

Approved By Karen Rya Date : 5/6/09

57A

Report By:SAnderson

1317 South 13th Avenue Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

May 26, 2009 Analytical Report for Service Request No: P0901522

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on May 05, 2009. For your reference, these analyses have been assigned our service request number P0901522.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3280. You may also contact me via Email at LKennedy@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Les Kennedy
Project Chemist

LK/rh

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Battelle	**Service Request No.:**	P0901522
Project:	JPL GW Mon 2Q09	**Date Received:**	5/5/09
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One water sample received for analysis at Columbia Analytical Services, Simi Valley laboratory on 5/5/09 was forwarded and received in the Kelso laboratory on 5/6/09 in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Nitrosamines by EPA Method 521

No anomalies associated with the analysis of this batch were observed.

Approved by ill **Date** 5/26/09

Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

CAS Contact: Sue Anderson

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Project Name: JPL GW Mon 2Q09
Project Number: G486090
Project Manager: David Conner
Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Nitrosamines 521
P0901522-002	MW-17-4	4	Water	5/5/09	0918	5/5/09	KELSO	III

Test Comments

Nitrosamines - 521 P0901522-002 NDMA
MS/MSD on this sample

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Folder Comments:

Note: EDF files for client's internal data base;LogCode is BAT, do not have Global ID. EDD & pdf of report sent to Betsy Cutie (cutiee@battelle.org) via file share site https://fx.battelle.org. For EDF unique spike ids (ex: P0701XXX01MS or SD).

Special Instructions/Comments	Turnaround Requirements	Report Requirements	Invoice Information
	____ **RUSH** (Surcharges Apply) **PLEASE CIRCLE WORK DAYS** 1 2 3 4 5 X **STANDARD** Requested FAX Date: ____ Requested Report Date: 05/22/09	____ I. Results Only ____ II. Results + QC Summaries ____ III. Results + QC and Calibration Summaries X IV. Data Validation Report with Raw Data Full Data Package PQL/MDL/J Y EDD Y	PO# P0901522 Bill to

Relinquished By: [signature] 5/5/09 14:55

Received By: [signature] GLS 5/6/09 1150

Airbill Number:

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC Les

Client / Project: CAS - Simi Valley Service Request ~~K09~~ P0901522

Received: 5-6-09 Opened: 5-6-09 By: Brad

1. Samples were received via? *US Mail* *Fed Ex* (*UPS*) *DHL* *GH* *GS* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where?_____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: 1Z78905X1342116429 NA (Y) N

5. **Temperature of cooler(s) upon receipt (°C):**	-0.5			
Temperature Blank (°C):	N/A			
Thermometer ID:	268			
6. If applicable, list Chain of Custody Numbers:				

7. Packing material used. *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Sleeves* *Other*_____
8. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
9. **Did all bottles arrive in good condition (unbroken)?** *Indicate in the table below.* NA (Y) N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
11. Did all sample labels and tags agree with custody papers? *Indicate in the table below* NA (Y) N
12. **Were appropriate bottles/containers and volumes received for the tests indicated?** NA (Y) N
13. Were the pH-preserved bottles tested* received at the appropriate pH? *Indicate in the table below* (NA) Y N
14. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** (NA) Y N
16. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

*Additional Notes, Discrepancies, & Resolutions:*_____

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Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901522

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-17-4MS	KWG0904110-1	05/05/2009	05/05/2009
MW-17-4DMS	KWG0904110-2	05/05/2009	05/05/2009
MW-17-4	P0901522-002	05/05/2009	05/05/2009

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Loren E Portwood Name: Loren Portwood

Date: 5/19/09 Title: Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P0901522
Project:	JPL GW Mon 2Q09/G486090	**Date Collected:**	05/05/2009
Sample Matrix:	Water	**Date Received:**	05/05/2009

Nitrosamines by EPA 521

Sample Name:	MW-17-4	**Units:**	ng/L
Lab Code:	P0901522-002	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	**0.82**	J	2.0	0.54	1	05/15/09	05/16/09	KWG0904110	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	85	70-130	05/16/09	Acceptable

Comments:

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901477

Table of Contents

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 1, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 30, 2009. For your reference, these analyses have been assigned our service request number P0901477.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 26 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle
Project: JPL GW Mon 2Q09 / G486090

CAS Project No: P0901477

CASE NARRATIVE

The samples were received intact under chain of custody on April 30, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901477

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901477-001	MW-18-5	4/30/09	09:07
P0901477-002	MW-18-4	4/30/09	09:49
P0901477-003	MW-18-3	4/30/09	10:13
P0901477-004	MW-18-2	4/30/09	11:32
P0901477-005	MW-18-1	4/30/09	12:25
P0901477-006	EB-07-4/30/09	4/30/09	12:09

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P0901477

CAS Contact:

Analysis Method and/or Analytes

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 2Q09
Project Number	G4486090
Project Manager	DAVID CONNER
P.O. # / Billing Information	21439 / BATTELLE ATTN: GOTHOLD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone	619-726-7311
Fax	
Email Address for Result Reporting	
Sampler (Print & Sign)	

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (7196)	0 Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-18-5	1	4/30/09	0907	W	1						X			
MW-18-4	2		0949		2						X			MS/MSD
MW-18-3	3		1013		1						X			
MW-18-2	4		1132		2						X			MS/MSD
MW-18-1	5		1225		1						X			
EB-07-4/30/09	6		1209		1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 4/30/09	Time: 1500	Received by: (Signature)		Date: 4/30/09	Time: 1500
Relinquished by: (Signature)		Date: 4/30/09	Time: 2345	Received by: (Signature)		Date: 4/30/09	Time: 2345
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901477

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901477-001.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-002.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-002.02					
		4/30/09	1402	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-003.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-004.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-004.02					
		4/30/09	1402	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-005.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-006.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	

6

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901477

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	

7

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901477

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/30/09 Date opened: 04/30/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901477-001.01	125mL Plastic NP					
P0901477-002.01	125mL Plastic NP					
P0901477-002.02	125mL Plastic NP					
P0901477-003.01	125mL Plastic NP					
P0901477-004.01	125mL Plastic NP					
P0901477-004.02	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901477

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/30/09 Date opened: 04/30/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901477-005.01	125mL Plastic NP					
P0901477-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901477
Date Collected : 04/30/09
Date Received : 04/30/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-18-5	P0901477-001	0.010	0.003	1	NA	04/30/09 15:10	ND	
MW-18-4	P0901477-002	0.010	0.003	1	NA	04/30/09 15:10	ND	
MW-18-3	P0901477-003	0.010	0.003	1	NA	04/30/09 15:10	ND	
MW-18-2	P0901477-004	0.010	0.003	1	NA	04/30/09 15:10	ND	
MW-18-1	P0901477-005	0.010	0.003	1	NA	04/30/09 15:10	ND	
EB-07-4/30/09	P0901477-006	0.010	0.003	1	NA	04/30/09 15:10	ND	
Method Blank	P0901477-MB	0.010	0.003	1	NA	04/30/09 15:10	ND	

Approved By Karen Rya Date : 4/30/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901464

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

April 30, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 29, 2009. For your reference, these analyses have been assigned our service request number P0901464.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 24 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901464
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 29, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901464

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901464-001	MW-25-5	4/29/09	10:22
P0901464-002	MW-25-4	4/29/09	10:55
P0901464-003	MW-25-3	4/29/09	11:21
P0901464-004	MW-25-2	4/29/09	12:27
P0901464-005	MW-25-1	4/29/09	13:17
P0901464-006	DUPE-04-2Q09	4/29/09	00:00
P0901464-007	EB-06-4/29/09	4/29/09	11:52

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No.: PO#01464

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	P.O. # / Billing Information
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	JPL GW MON 2009	486090	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201

Project Manager	Phone	Fax
DAVID CONNER	619-726-7311	

Email Address for Result Reporting:

Sampler (Print & Sign):

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-25-5	1	4/29/09	1022	W	1						X			
MW-25-4	2	"	1055	"	"						X			
MW-25-3	3	"	1121	"	"						X			
MW-25-2	4	"	1227	"	"						X			
MW-25-1	5	"	1317	"	"						X			
DUPE-04-2009	6	"	—	"	"						X			DUPLICATE
EB-06-4/29/09	7	"	1152	"	1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	4/29/09	1430	Received by: (Signature)	4/29/09	1430
Relinquished by: (Signature)	4/29/09	1800	Received by: (Signature)	4/29/09	1800
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901464

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901464-001.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1527	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-002.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1527	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-003.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1527	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-004.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1528	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-005.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1528	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-006.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1528	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	
P0901464-007.01					
	7196A				
		4/29/09	1508	SMO / MZAMORA	
		4/29/09	1508	P-37 / MZAMORA	
		4/29/09	1528	In Lab / SANDERSON	
		4/29/09	1754	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901464

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/29/09 Date opened: 04/29/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901464-001.01	125mL Plastic NP					
P0901464-002.01	125mL Plastic NP					
P0901464-003.01	125mL Plastic NP					
P0901464-004.01	125mL Plastic NP					
P0901464-005.01	125mL Plastic NP					
P0901464-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901464

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/29/09 Date opened: 04/29/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901464-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901464
Date Collected : 04/29/09
Date Received : 04/29/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-25-5	P0901464-001	0.010	0.003	1	NA	04/29/09 16:45	ND	
MW-25-4	P0901464-002	0.010	0.003	1	NA	04/29/09 16:45	ND	
MW-25-3	P0901464-003	0.010	0.003	1	NA	04/29/09 16:45	ND	
MW-25-2	P0901464-004	0.010	0.003	1	NA	04/29/09 16:45	ND	
MW-25-1	P0901464-005	0.010	0.003	1	NA	04/29/09 16:45	ND	
DUPE-04-2Q09	P0901464-006	0.010	0.003	1	NA	04/29/09 16:45	ND	
EB-06-4/29/09	P0901464-007	0.010	0.003	1	NA	04/29/09 16:45	ND	
Method Blank	P0901464-MB	0.010	0.003	1	NA	04/29/09 16:45	ND	

Approved By Karen Ryan Date : 4/30/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901451

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

April 29, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 28, 2009. For your reference, these analyses have been assigned our service request number P0901451.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 24 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Client: Battelle CAS Project No: P0901451
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 28, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901451

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901451-001	MW-21-5	4/28/09	08:50
P0901451-002	MW-21-4	4/28/09	09:20
P0901451-003	MW-21-3	4/28/09	10:02
P0901451-004	MW-21-2	4/28/09	10:35
P0901451-005	MW-21-1	4/28/09	11:08
P0901451-006	DUPE-03-2Q09	4/28/09	00:00
P0901451-007	EB-05-4/28/09	4/28/09	10:55

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P090451

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE. C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON 2009

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
21489/BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (196)	0 DIOXANE (8270)	0 NDMA (1625)	Remarks
MW-21-5	1	4/28/09	0850	W	1							X			
MW-21-4	2		0920									X			
MW-21-3	3		1002									X			
MW-21-2	4		1035									X			
MW-21-1	5		1108									X			
DUPE-03-2009	6		—									X			DUPLICATE
EB-05-4/28/09	7		1055		1							X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ___
Tier II - (Results + QC) ___
Tier III - (Data Validation Package) 10% Surcharge ___
Tier V - (client specified) ___

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ___

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	4/29/09	1230	Received by: (Signature)	4/29/09	12:30
Relinquished by: (Signature)	4/29/09	1300	Received by: (Signature)	4/29/09	1500
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901451

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901451-001.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-002.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-003.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-004.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-005.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-006.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
P0901451-007.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901451

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/28/09 Date opened: 04/28/09 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901451-001.01	125mL Plastic NP					
P0901451-002.01	125mL Plastic NP					
P0901451-003.01	125mL Plastic NP					
P0901451-004.01	125mL Plastic NP					
P0901451-005.01	125mL Plastic NP					
P0901451-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide NaOH (pH>12); T. Sulfide NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901451

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/28/09 Date opened: 04/28/09 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901451-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901451
Date Collected : 04/28/09
Date Received : 04/28/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-21-5	P0901451-001	0.010	0.003	1	NA	04/28/09 14:40	ND	
MW-21-4	P0901451-002	0.010	0.003	1	NA	04/28/09 14:40	ND	
MW-21-3	P0901451-003	0.010	0.003	1	NA	04/28/09 14:40	ND	
MW-21-2	P0901451-004	0.010	0.003	1	NA	04/28/09 14:40	ND	
MW-21-1	P0901451-005	0.010	0.003	1	NA	04/28/09 14:40	ND	
DUPE-03-2Q09	P0901451-006	0.010	0.003	1	NA	04/28/09 14:40	ND	
EB-05-4/28/09	P0901451-007	0.010	0.003	1	NA	04/28/09 14:40	ND	
Method Blank	P0901451-MB	0.010	0.003	1	NA	04/28/09 14:40	ND	

Approved By Karen Rya Date : 4/29/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901437

Table of Contents

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

April 28, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 27, 2009. For your reference, these analyses have been assigned our service request number P0901437.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 24 pages.

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Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle
Project: JPL GW Mon 2Q09 / G486090

CAS Project No: P0901437

CASE NARRATIVE

The samples were received intact under chain of custody on April 27, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901437

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901437-001	MW-3-5	4/27/09	07:50
P0901437-002	MW-3-4	4/27/09	08:20
P0901437-003	MW-3-3	4/27/09	08:50
P0901437-004	MW-3-2	4/27/09	09:22
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Acronyms

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ICV	Initial Calibration Verification
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VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

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B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P090 1437

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON 2009

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319 / BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (218.6)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-3-5	1	4/27/09	0750	W	1						X			
MW-3-4	2	"	0820	"	"						X			
MW-3-3	3	"	0850	"	"						X			
MW-3-2	4	"	0922	"	"						X			
MW-3-1	5	"	0954	"	"						X			QC LEVEL IV
EB-04-4/27/09	6	"	0940	"	"						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	4/27/09	1157	Received by: (Signature)	4/27/09	1157
Relinquished by: (Signature)	4/27/09	1400	Received by: (Signature)	4/27/09	1400
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 7.0 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901437

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901437-001.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	
P0901437-002.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	
P0901437-003.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	
P0901437-004.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	
P0901437-005.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	
P0901437-006.01					
	7196A				
		4/27/09	1401	SMO / MZAMORA	
		4/27/09	1401	P-37 / MZAMORA	
		4/27/09	1437	In Lab / SANDERSON	
		4/27/09	1631	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901437

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/27/09 Date opened: 04/27/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature 2 °C Blank Temperature _____ °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901437-001.01	125mL Plastic NP					
P0901437-002.01	125mL Plastic NP					
P0901437-003.01	125mL Plastic NP					
P0901437-004.01	125mL Plastic NP					
P0901437-005.01	125mL Plastic NP					
P0901437-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901437
Date Collected : 04/27/09
Date Received : 04/27/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-3-5	P0901437-001	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-4	P0901437-002	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-3	P0901437-003	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-2	P0901437-004	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-1	P0901437-005	0.010	0.003	1	NA	04/27/09 15:50	ND	
EB-04-4/27/09	P0901437-006	0.010	0.003	1	NA	04/27/09 15:50	ND	
Method Blank	P0901437-MB	0.010	0.003	1	NA	04/27/09 15:50	ND	

Approved By Karen Rya Date : 4/28/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901409

Table of Contents

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

May 13, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 23, 2009. Two of the samples were sent out for partial analysis to our Kelso facility. Please find their report attached. For your reference, these analyses have been assigned our service request number P0901409.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 202 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901409
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 23, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

1,4-Dioxane by EPA Method 8270C SIM Modified

No anomalies were encountered during this analysis.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901409

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901409-001	MW-24-5	4/23/09	08:45
P0901409-002	MW-24-4	4/23/09	09:45
P0901409-003	MW-24-3	4/23/09	10:48
P0901409-004	MW-24-2	4/23/09	12:00
P0901409-005	MW-24-1	4/23/09	12:37
P0901409-006	DUPE-01-2Q09	4/23/09	00:00
P0901409-007	DUPE-02-2Q09	4/23/09	00:00
P0901409-008	EB-03-4/23/09	4/23/09	12:51

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P0901409

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	SPL GW MON 2Q09 Project Number G486090
Project Manager DAVID CONNER	P.O. # / Billing Information 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone 614-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 Dioxane (8270)	0 NDMA (1625.0)	Remarks
MW-24-5	1	4/23/09	0845	W	1						X			
MW-24-4	2	"	0945	"	2						X			MS/MSD
MW-24-3	3	"	1048	"	2						X			MS/MSD
MW-24-2	4	"	1200	"	1						X			
MW-24-1	5	"	1237	"	4						X	X	X	
DUPE-01-2Q09	6	"	—	"	1						X			DUPLICATE
DUPE-02-2Q09	7	"	—	"	4						X	X	X	DUPLICATE
EB-03-4/23/09	8	"	1251	"	1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / RQL / J required Yes / No
EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 4/23/09	Time: 1425	Received by: (Signature)	Date: 4/23/09	Time: 1425	
Relinquished by: (Signature)	Date: 4/23/09	Time: 1815	Received by: (Signature)	Date: 4/24/09	Time: 0515	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	Temperature 3.6 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901409

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901409-001.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-002.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-002.02					
		4/23/09	1546	SMO / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-003.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-003.02					
		4/23/09	1547	SMO / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-004.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-005.01					
	521				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
P0901409-005.02					
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
		5/1/09	1200	In Lab / LPORTWOOD	
		5/1/09	1707	K-HERK-A3 / LRAVERT	

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Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901409

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901409-005.03					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-005.04					
	8270C SIM				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	P-16 / MZAMORA	
P0901409-006.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-007.01					
	521				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
		5/1/09	1200	In Lab / LPORTWOOD	
		5/1/09	1707	K-HERK-A3 / LRAVERT	
P0901409-007.02					
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
P0901409-007.03					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-007.04					
	8270C SIM				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	P-16 / MZAMORA	
P0901409-008.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1550	In Lab / SANDERSON	

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Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901409

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		4/23/09	1727	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901409

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/23/09 Date opened: 04/23/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901409-001.01	125mL Plastic NP					
P0901409-002.01	125mL Plastic NP					
P0901409-002.02	125mL Plastic NP					
P0901409-003.01	125mL Plastic NP					
P0901409-003.02	125mL Plastic NP					
P0901409-004.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901409

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/23/09 Date opened: 04/23/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901409-005.01	1000ml AG NP					
P0901409-005.02	1000ml AG NP					
P0901409-005.03	125mL Plastic NP					
P0901409-005.04	500mL AG NP					
P0901409-006.01	125mL Plastic NP					
P0901409-007.01	1000ml AG NP					
P0901409-007.02	1000ml AG NP					
P0901409-007.03	125mL Plastic NP					
P0901409-007.04	500mL AG NP					
P0901409-008.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

1,4 – Dioxane

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: **Battelle**
Client Project ID: **JPL GW Mon 2Q09 / G486090**

CAS Project ID: P0901409

1,4-Dioxane

Test Code: EPA 8270C SIM Modified
Instrument ID: HP5971A/HP5890 II/MS1
Analyst: Hani Cherazaie
Matrix: Water
Test Notes:

Date(s) Collected: 4/23/09
Date Received: 4/23/09
Date Extracted: 4/29/09
Date Analyzed: 4/29/09
Final Extract Volume: 1.0 ml(s)

Client Sample ID	CAS Sample ID	Dilution Factor	Sample Volume Liter(s)	Result µg/L	MRL µg/L	MDL µg/L	Data Qualifier
MW-24-1	P0901409-005	1.0	0.10	**1.0**	0.50	0.21	
DUPE-02-2Q09	P0901409-007	1.0	0.10	**1.0**	0.50	0.21	
Method Blank	P090429-MB	1.0	0.10	ND	0.50	0.21	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901409
Date Collected : 04/23/09
Date Received : 04/23/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-24-5	P0901409-001	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-4	P0901409-002	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-3	P0901409-003	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-2	P0901409-004	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-1	P0901409-005	0.010	0.003	1	NA	04/23/09 16:30	ND	
DUPE-01-2Q09	P0901409-006	0.010	0.003	1	NA	04/23/09 16:30	ND	
DUPE-02-2Q09	P0901409-007	0.010	0.003	1	NA	04/23/09 16:30	ND	
EB-03-4/23/09	P0901409-008	0.010	0.003	1	NA	04/23/09 16:30	ND	
Method Blank	P0901409-MB	0.010	0.003	1	NA	04/23/09 16:30	ND	

Approved By Karen Ryan Date : 4/24/09

Report By:SAnderson

DIVIDER SHEET

CAS-KELSO

Data Package

1317 South 13th Avenue Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

May 6, 2009 Analytical Report for Service Request No: P0901409

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on April 23, 2009. For your reference, these analyses have been assigned our service request number P0901409.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3280. You may also contact me via Email at LKennedy@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

5/05/09

Les Kennedy
Project Chemist

LK/ln

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Battelle	**Service Request No.:**	P0901409
Project:	JPL GW Mon 2Q09	**Date Received:**	04/23/09
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two water samples were received for analysis at Columbia Analytical Services on 04/23/09. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Nitrosamines by EPA Method 521

No anomalies associated with the analysis of these samples were observed.

Approved by BK Date 05/06/09

Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

CAS Contact: Sue Anderson

Project Name: JPL GW Mon 2Q09
Project Number: G486090
Project Manager: David Conner
Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Nitrosamines 521
P0901409-005	MW-24-1	2	Water	4/23/09	1237	4/23/09	KELSO	III
P0901409-007	DUPE-02-2Q09	2	Water	4/23/09	0000	4/23/09	KELSO	III

Test Comments

Nitrosamines - 521 P0901409-005,7 NDMA

Folder Comments:

Note: EDF files for client's internal data base;LogCode is BAT,do not have Global ID. EDD & pdf of report sent to Betsy Cutie (cutiee@battelle.org) via file share site https://fx.battelle.org. For EDF unique spike ids (ex: P0701XXX01MS or SD).

Special Instructions/Comments	Turnaround Requirements	Report Requirements	Invoice Information
	____ **RUSH** (Surcharges Apply) **PLEASE CIRCLE WORK DAYS** 1 2 3 4 5 ____ **STANDARD** Requested FAX Date: _____ Requested Report Date: 05/10/09	____ I. Results Only ____ II. Results + QC Summaries X III. Results + QC and Calibration Summaries Full Data PAC/C ____ IV. Data Validation Report with Raw Data PQL/MDL/J Y EDD Y	PO# P0901409 Bill to

Relinquished By: [signature] 4/24/09 13:20

Received By: [signature] 4/25/09 0900

Exhibit Number:

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Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC LOS

Client / Project: CAS/Simi Service Request ~~K09~~ D0901409

Received: 4/25/09 Opened: 4/25/09 By: Amanda

1. Samples were received via? *US Mail* *Fed Ex* (*UPS*) *DHL* *GH* *GS* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: 1278905X4440200309 NA (Y) N

5. **Temperature of cooler(s) upon receipt (°C):**	-0.4			
Temperature Blank (°C):	✓			
Thermometer ID:	2Ic1			
6. If applicable, list Chain of Custody Numbers:				

7. Packing material used. *Inserts* *Baggies* (*Bubble Wrap*) (*Gel Packs*) *Wet Ice* *Sleeves* *Other* _____

8. Were custody papers properly filled out (ink, signed, etc.)?	NA	(Y)	N
9. **Did all bottles arrive in good condition (unbroken)?** *Indicate in the table below.*	NA	(Y)	N
10. Were all sample labels complete (i.e analysis, preservation, etc.)?	NA	(Y)	N
11. Did all sample labels and tags agree with custody papers? *Indicate in the table below*	NA	(Y)	N
12. **Were appropriate bottles/containers and volumes received for the tests indicated?**	NA	(Y)	N
13. Were the pH-preserved bottles tested* received at the appropriate pH? *Indicate in the table below*	(NA)	Y	N
14. Were VOA vials received without headspace? *Indicate in the table below.*	(NA)	Y	N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?**	(NA)	Y	N
16. Was C12/Res negative?	(NA)	Y	N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

Additional Notes, Discrepancies, & Resolutions: _____

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Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901409

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-24-1	P0901409-005	04/23/2009	04/23/2009
DUPE-02-2Q09	P0901409-007	04/23/2009	04/23/2009

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: [signature] Name: Loren Portwood

Date: 5/6/09 Title: Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P0901409
Project:	JPL GW Mon 2Q09/G486090	**Date Collected:**	04/23/2009
Sample Matrix:	Water	**Date Received:**	04/23/2009

Nitrosamines by EPA 521

Sample Name:	MW-24-1	**Units:**	ng/L
Lab Code:	P0901409-005	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	0.76	J	2.0	0.54	1	05/01/09	05/04/09	KWG0903710	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	94	70-130	05/04/09	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P0901409
Project:	JPL GW Mon 2Q09/G486090	**Date Collected:**	04/23/2009
Sample Matrix:	Water	**Date Received:**	04/23/2009

Nitrosamines by EPA 521

Sample Name:	DUPE-02-2Q09	**Units:**	ng/L
Lab Code:	P0901409-007	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.54	1	05/01/09	05/04/09	KWG0903710	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	93	70-130	05/04/09	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P0901409
Project:	JPL GW Mon 2Q09/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG0903710-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.54	1	05/01/09	05/03/09	KWG0903710	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	94	70-130	05/03/09	Acceptable

Comments:

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901384

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

April 24, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 22, 2009. For your reference, these analyses have been assigned our service request number P0901384.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901384
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 22, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901384

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901384-001	MW-22-5	4/22/09	08:13
P0901384-002	MW-22-4	4/22/09	08:55
P0901384-003	MW-22-3	4/22/09	09:51
P0901384-004	MW-22-2	4/22/09	10:25
P0901384-005	MW-22-1	4/22/09	11:03
P0901384-006	EB-02-04/22/09	4/22/09	10:50

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Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P0C0 13584

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 2009
Project Manager	**Project Number**
DAVID CONNELL	6486090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319/ BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 EDB (504.1)	Remarks
MW-22-5	1	4/22/09	0813	W	1							X			
MW-22-4	2	|	0855	|	2							X			MS/MSD
MW-22-3	3	|	0951	|	1							X			
MW-22-2	4	|	1025	|	|						X			
MW-22-1	5	|	1103	|	|						X			
EB-02-04/22/09	6	|	1050	|	1							X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____ Tier III - (Data Validation Package) 10% Surcharge ____ MRL required Yes / No EDD required Yes / No
Tier II - (Results + QC) ____ Tier V - (client specified) ____ MDL / PQL / J required Yes / No Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 4/22/09	Time: 1230	Received by: (Signature)	Date: 4/22/09	Time: 1750
Relinquished by: (Signature)	Date: 4/22/09	Time: 2100	Received by: (Signature)	Date: 4/22/09	Time: 1310
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 2°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901384

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901384-001.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-002.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-002.02					
		4/22/09	1323	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-003.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-004.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-005.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-006.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901384

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/22/09 Date opened: 04/22/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901384-001.01	125mL Plastic NP					
P0901384-002.01	125mL Plastic NP					
P0901384-002.02	125mL Plastic NP					
P0901384-003.01	125mL Plastic NP					
P0901384-004.01	125mL Plastic NP					
P0901384-005.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901384

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/22/09 Date opened: 04/22/09 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901384-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);
Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901384
Date Collected : 04/22/09
Date Received : 04/22/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-22-5	P0901384-001	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-4	P0901384-002	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-3	P0901384-003	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-2	P0901384-004	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-1	P0901384-005	0.010	0.003	1	NA	04/22/09 14:40	ND	
EB-02-04/22/09	P0901384-006	0.010	0.003	1	NA	04/22/09 14:40	ND	
Method Blank	P0901384-MB	0.010	0.003	1	NA	04/22/09 14:40	ND	

Approved By Karen Ryan Date : 4/23/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901360

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

April 22, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 21, 2009. For your reference, these analyses have been assigned our service request number P0901360.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 24 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0901360
Project: JPL GW Mon 2Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 21, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901360

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901360-001	MW-14-5	4/21/09	09:00
P0901360-002	MW-14-4	4/21/09	09:40
P0901360-003	MW-14-3	4/21/09	10:15
P0901360-004	MW-14-2	4/21/09	10:55
P0901360-005	MW-14-1	4/21/09	11:40
P0901360-006	EB-01-4/21/09	4/21/09	11:20

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P093136O

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON 2009

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319/BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-14-5	1	4/21/09		W	1						X			
MW-14-4	2	"		"	"						X			
MW-14-3	3	"		"	"						X			
MW-14-2	4	"		"	"						X			
MW-14-1	5	"		"	"						X			
EB-01-4/21/09	6	"		"	1						X			EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 4/21/09	Time: 1230	Received by: (Signature)	Date: 4/21/09	Time: 12:30
Relinquished by: (Signature)	Date: 4/21/09	Time: 13:10	Received by: (Signature)	Date: 4/21/09	Time: 1310
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901360

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901360-001.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-002.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-003.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-004.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-005.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-006.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901360

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 04/21/09 Date opened: 04/21/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☐	☒	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901360-001.01	125mL Plastic NP					
P0901360-002.01	125mL Plastic NP					
P0901360-003.01	125mL Plastic NP					
P0901360-004.01	125mL Plastic NP					
P0901360-005.01	125mL Plastic NP					
P0901360-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

Chain of Custody is missing time collected

The times were noted from the sample labels.

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901360
Date Collected : 04/21/09
Date Received : 04/21/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-14-5	P0901360-001	0.010	0.003	1	NA	04/21/09 14:30	ND	
MW-14-4	P0901360-002	0.010	0.003	1	NA	04/21/09 14:30	ND	
MW-14-3	P0901360-003	0.010	0.003	1	NA	04/21/09 14:30	ND	
MW-14-2	P0901360-004	0.010	0.003	1	NA	04/21/09 14:30	ND	
MW-14-1	P0901360-005	0.010	0.003	1	NA	04/21/09 14:30	ND	
EB-01-4/21/09	P0901360-006	0.010	0.003	1	NA	04/21/09 14:30	ND	
Method Blank	P0901360-MB	0.010	0.003	1	NA	04/21/09 14:30	ND	

Approved By Karen Rya Date : 4/22/09

Report By:SAnderson

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0901783

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2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

June 1, 2009

David Conner
Battelle
3990 Old Town Ave., Suite C-205
San Diego, CA 92110

RE: JPL GW Mon 2Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 27, 2009. For your reference, these analyses have been assigned our service request number P0901783.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

2655 Park Center Drive, Suite A Simi Valley, California 93065 (805) 526-7161 (805) 526-7270 fax

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle
Project: JPL GW Mon 2Q09 / G486090

CAS Project No: P0901783

CASE NARRATIVE

The samples were received intact under chain of custody on May 27, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901783

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0901783-001	MW-1	5/27/09	08:45
P0901783-002	MW-9	5/27/09	10:13

3

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Water & Soil - Chain of Custody Record & Analytical Service Request

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. R0901753

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	SPL GW MON 2009
	Project Number: 6486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: 619-726-7311	Fax:
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (796)	0 DIOXANE (8270)	0 NDMA (1625.0)	Remarks
MW-1	1	5/27/09	0845	W	1							X			
MW-9	2	/	1013	/	1							X			QC LEVEL IV
EB	/	/	/	/	1							X			EQUIPMENT BLANK

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/27/09	1130		5/27/09	11:30
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/27/09	1225		5/27/09	1225
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q09/G486090

Service Request: P0901783

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901783-001.01					
	7196A				
		5/27/09	1247	SMO / MZAMORA	
		5/27/09	1247	P-37 / MZAMORA	
		5/27/09	1321	In Lab / SANDERSON	
		5/28/09	0731	P-37 / SANDERSON	
P0901783-002.01					
	7196A				
		5/27/09	1247	SMO / MZAMORA	
		5/27/09	1247	P-37 / MZAMORA	
		5/27/09	1321	In Lab / SANDERSON	
		5/28/09	0731	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0901783

Project: JPL GW Mon 2Q09 / G486090

Sample(s) received on: 05/27/09 Date opened: 05/27/09 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Was a **chain-of-custody** provided?	☒	☐	☐
5	Was the **chain-of-custody** properly completed?	☒	☐	☐
6	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
7	Was **sample volume** received adequate for analysis?	☒	☐	☐
8	Are samples within specified holding times?	☒	☐	☐
9	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: _____ °C Blank Temperature 3 °C			
10	Was a **trip blank** received?	☐	☒	☐
	Trip blank supplied by CAS: _____			
11	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
12	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
13	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
14	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901783-001.01	125mL Plastic NP					
P0901783-002.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

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*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

05/27/09 1:42 PM

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0901783
Date Collected : 05/27/09
Date Received : 05/27/09

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-1	P0901783-001	0.010	0.003	1	NA	05/27/09 15:20	ND	
MW-9	P0901783-002	0.010	0.003	1	NA	05/27/09 15:20	ND	
Method Blank	P0901783-MB	0.010	0.003	1	NA	05/27/09 15:20	ND	

Approved By KwH Date : 05/28/09

Report By:SAnderson