COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001729
Date Collected : 05/18/10
Date Received : 05/18/10

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	P1001729-001	0.010	0.004	1	NA	05/18/10 16:55	ND	
MW-17-4	P1001729-002	0.010	0.004	1	NA	05/18/10 16:55	ND	
MW-17-3	P1001729-003	0.010	0.004	1	NA	05/18/10 16:55	ND	
MW-17-2	P1001729-004	0.010	0.004	1	NA	05/18/10 16:55	ND	
MW-17-1	P1001729-005	0.010	0.004	1	NA	05/18/10 16:55	ND	
DUPE-6-2Q10	P1001729-006	0.010	0.004	1	NA	05/18/10 16:55	ND	
EB-13-05/18-10	P1001729-007	0.010	0.004	1	NA	05/18/10 16:55	ND	
Method Blank	P1001729-MB	0.010	0.004	1	NA	05/18/10 16:55	ND	

Approved By Wida Ang Date : 5/19/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10 / G486090	**Date Analyzed:**	05/18/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Dida Ang Date: 5/19/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001729
Date Analyzed: 05/18/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0589	102	90-110
CCV1	0.0579	0.0589	102	90-110
CCV2	0.0579	0.0578	100	90-110

Approved By: Wida Ang Date: 5/19/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001729
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/18/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001729-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0395	99	90-109	

Approved By Wida Ang Date : 5/19/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001729
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	05/18/10
Project Number :	G486090	**Date Received :**	05/18/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/18/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-17-5 Units : mg/L (ppm)
Lab Code : P1001729-001MS P1001729-001DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0427	0.0427	85	85	78-112	<1	

Approved By Wida Ang Date : 5/19/10

Report By:SAnderson

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

June 8, 2010 Analytical Report for Service Request No: P1001729

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

RE: JPL GW Mon. 2Q10/G486090

Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on May 18, 2010. For your reference, these analyses have been assigned our service request number P1001729.

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 3376. You may also contact me via Email at GSalata@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Gregory Salata, Ph.D.
Project Chemist

GS/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 as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value that was detected outside the quantitation range.
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 analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
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 or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

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 as defined by the DOD or NELAC standards.
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 value that was detected outside the quantitation range.
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.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

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)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Battelle	**Service Request No.:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Received:**	05/18/10
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 was received for analysis at Columbia Analytical Services on 05/18/10. The sample was received 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 these samples were observed.

1,4-Dioxane by EPA Method 8270C

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recovery of 1,4-Dioxane for sample Batch QC were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

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

Approved by _____ Date 6/11/10

Chain of Custody

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. 2Q10
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	14_DIOXANE 8270C SIM	Nitrosamines 521
P1001729-002	MW-17-4	3	Water	5/18/10	0943	5/18/10	KELSO	IV	IV

Test Comments

Nitrosamines - 521	P1001729-002	NDMA

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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: P1000XXX01MS 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: 06/05/10	___ I. Results Only ___ II. Results + QC Summaries ___ III. Results + QC and Calibration Summaries X IV. Data Validation Report with Raw Data PQL/MDL/J Y EDD Y	PO# P1001729 Bill to

Relinquished By: _____ 5/19/10 1590

Received By: _____ 5/20/10 0950

Airbill Number: _____

PC Greg

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

Client / Project: CAS Simi Valley Service Request K10 P100729

Received: 5-20-10 Opened: 5-20-10 By: DW

1. Samples were received via? *Mail* *Fed Ex* (*UPS*) *DHL* *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? 1 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.1	N.P.	279		1Z 789 05X 01 4253 7667	

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 major discrepancies in the table on page 2.* NA (Y) N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
13. Were the pH-preserved bottles (*see SMO GEN SOP*) 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. Was C12/Res negative? NA (Y) N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

Nitrosamines

Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-17-4	P1001729-002	05/18/2010	05/18/2010

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: Tom E Portwood

Name: Tom Portwood

Date: 6/8/10

Title: Scientist

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Collected:**	05/18/2010
Sample Matrix:	Water	**Date Received:**	05/18/2010

Nitrosamines by EPA 521

Sample Name:	MW-17-4	**Units:**	ng/L
Lab Code:	P1001729-002	**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	**0.48**	J	2.0	0.32	1	05/27/10	05/30/10	KWG1005011	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	90	70-130	05/30/10	Acceptable

Comments:

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1005011-4	**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	**0.58**	J	2.0	0.32	1	05/27/10	05/29/10	KWG1005011	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	109	70-130	05/29/10	Acceptable

Comments:

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090
Sample Matrix: Water

Service Request: P1001729

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

Sample Name	Lab Code	Sur1
MW-17-4	P1001729-002	90
Method Blank	KWG1005011-4	109
Batch QC	K1005183-001	108
Batch QCMS	KWG1005011-1	110
Batch QCDMS	KWG1005011-2	125
Lab Control Sample	KWG1005011-3	100

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Extracted:**	05/27/2010
Sample Matrix:	Drinking water	**Date Analyzed:**	05/29/2010 - 05/30/2010

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	K1005183-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**Extraction Lot:**	KWG1005011

Analyte Name	Sample Result	Batch QCMS KWG1005011-1 Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	Batch QCDMS KWG1005011-2 Duplicate Matrix Spike Result	Duplicate Matrix Spike Expected	Duplicate Matrix Spike %Rec	%Rec Limits	RPD	RPD Limit
N-Nitrosodimethylamine	0.52	1.88	2.00	68	2.56	2.00	102	50-150	31	50

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Extracted:**	05/27/2010
Sample Matrix:	Drinking water	**Date Analyzed:**	05/29/2010

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method:	METHOD	**Units:**	ng/L
Analysis Method:	521	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1005011

	Lab Control Sample KWG1005011-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
N-Nitrosodimethylamine	1.98	2.00	99	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Extracted:**	05/27/2010
Sample Matrix:	Drinking water	**Date Analyzed:**	05/29/2010
		Time Analyzed:	21:49

Method Blank Summary
Nitrosamines by EPA 521

Sample Name:	Method Blank	**File ID:**	J:\MS16\DATA\052910-521\0529014.D
Lab Code:	KWG1005011-4	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**Extraction Lot:**	KWG1005011

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1005011-3	J:\MS16\DATA\052910-521\0529015.D	05/29/10	22:14
Batch QC	K1005183-001	J:\MS16\DATA\052910-521\0529018.D	05/29/10	23:28
Batch QCMS	KWG1005011-1	J:\MS16\DATA\052910-521\0529019.D	05/29/10	23:53
Batch QCDMS	KWG1005011-2	J:\MS16\DATA\052910-521\0529020.D	05/30/10	00:18
MW-17-4	P1001729-002	J:\MS16\DATA\052910-521\0529022.D	05/30/10	01:08

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1001729
Project:	JPL GW Mon. 2Q10/G486090	**Date Extracted:**	05/27/2010
Sample Matrix:	Drinking water	**Date Analyzed:**	05/29/2010
		Time Analyzed:	22:14

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**File ID:**	J:\MS16\DATA\052910-521\0529015.D
Lab Code:	KWG1005011-3	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**Extraction Lot:**	KWG1005011

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1005011-4	J:\MS16\DATA\052910-521\0529014.D	05/29/10	21:49
Batch QC	K1005183-001	J:\MS16\DATA\052910-521\0529018.D	05/29/10	23:28
Batch QCMS	KWG1005011-1	J:\MS16\DATA\052910-521\0529019.D	05/29/10	23:53
Batch QCDMS	KWG1005011-2	J:\MS16\DATA\052910-521\0529020.D	05/30/10	00:18
MW-17-4	P1001729-002	J:\MS16\DATA\052910-521\0529022.D	05/30/10	01:08

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729
Calibration Date: 05/29/2010

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL9512
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\052910-521\0529002.D	D	J:\MS16\DATA\052910-521\0529006.D
B	J:\MS16\DATA\052910-521\0529003.D	E	J:\MS16\DATA\052910-521\0529008.D
C	J:\MS16\DATA\052910-521\0529005.D		

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	1.12	B	2.0	1.61	C	5.0	1.42	D	10	1.60	E	50	1.84
N-Nitrosodimethylamine	A	1.0	0.562	B	2.0	0.658	C	5.0	0.639	D	10	0.723	E	50	0.845

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729
Calibration Date: 05/29/2010

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL9512
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	AverageRF	% RSD	17.7		≤ 30	1.52		
N-Nitrosodimethylamine	MS	AverageRF	% RSD	15.5		≤ 30	0.685		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound ‡ CCC Compound

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729
Calibration Date: 05/29/2010
Date Analyzed: 05/29/2010

Second Source Calibration Verification
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL9512
Units: ug/L

File ID: J:\MS16\DATA\052910-521\0529009.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	9.7	0.685	0.665	-3	NA	± 30 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729
Date Analyzed: 05/29/2010

Continuing Calibration Verification Summary
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/29/2010
Calibration ID: CAL9512
Analysis Lot: KWG1005384
Units: ug/L

File ID: J:\MS16\DATA\052910-521\0529011.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	1.0	0.87		1.52	1.32	-13	NA	± 50 %	AverageRF
N-Nitrosodimethylamine	1.0	0.93		0.685	0.640	-7	NA	± 50 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729
Date Analyzed: 05/30/2010

Continuing Calibration Verification Summary
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/29/2010
Calibration ID: CAL9512
Analysis Lot: KWG1005384
Units: ug/L

File ID: J:\MS16\DATA\052910-521\0529023.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	5.0	4.7		1.52	1.44	-6	NA	± 50 %	AverageRF
N-Nitrosodimethylamine	5.0	4.5		0.685	0.622	-9	NA	± 50 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound ‡ CCC Compound

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729

Analysis Run Log
Nitrosamines by EPA 521

Analysis Method: 521

Analysis Lot: KWG1005384
Instrument ID: MS16

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
521\0529.D	GC/MS Tuning - Generic	KWG1005384-1	5/29/2010	15:59		5/29/2010	16:13
\0529011.D	Continuing Calibration Verification	KWG1005384-2	5/29/2010	20:34		5/29/2010	20:48
\0529014.D	Method Blank	KWG1005011-4	5/29/2010	21:49		5/29/2010	22:03
\0529015.D	Lab Control Sample	KWG1005011-3	5/29/2010	22:14		5/29/2010	22:28
\0529018.D	Batch QC	K1005183-001	5/29/2010	23:28		5/29/2010	23:42
\0529019.D	Batch QCMS	KWG1005011-1	5/29/2010	23:53		5/30/2010	00:07
\0529020.D	Batch QCDMS	KWG1005011-2	5/30/2010	00:18		5/30/2010	00:32
\0529021.D	ZZZZZZ	ZZZZZZ	5/30/2010	00:43		5/30/2010	00:57
\0529022.D	MW-17-4	P1001729-002	5/30/2010	01:08		5/30/2010	01:22
\0529023.D	Continuing Calibration Verification	KWG1005384-3	5/30/2010	01:33		5/30/2010	01:47

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090
Sample Matrix: Water

Service Request: P1001729
Date Extracted: 05/27/2010

Extraction Prep Log
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Extraction Lot: KWG1005011
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-17-4	P1001729-002	05/18/10	05/18/10	500ml	1ml	NA	
Method Blank	KWG1005011-4	NA	NA	500ml	1ml	NA	
Batch QC	K1005183-001	NA	NA	500ml	1ml	NA	
Batch QCMS	KWG1005011-1	NA	NA	500ml	1ml	NA	
Batch QCDMS	KWG1005011-2	NA	NA	500ml	1ml	NA	
Lab Control Sample	KWG1005011-3	NA	NA	500ml	1ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

CAS SR #P1001742

Table of Contents

Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 24, 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 19, 2010. For your reference, these analyses have been assigned our service request number P1001742.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001742

CASE NARRATIVE

The samples were received intact under chain of custody on May 19, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001742

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001742-001	MW-25-5	5/19/10	08:10
P1001742-002	MW-25-4	5/19/10	08:52
P1001742-003	MW-25-3	5/19/10	09:39
P1001742-004	MW-25-2	5/19/10	10:36
P1001742-005	MW-25-1	5/19/10	11:40
P1001742-006	DUPE-7-2Q10	5/19/10	00:00
P1001742-007	EB-14-05/19/10	5/19/10	11:20

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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.: P100172

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 2Q10	G486090

Project Manager	Phone	Fax	P.O. # / Billing Information
DAVID CONNER	(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)	Remarks
MW-25-5	1	5/19/10	810	W	1						X	
MW-25-4	2		852		1						X	
MW-25-3	3		939		2						X	MS/MSD
MW-25-2	4		1036		1						X	
MW-25-1	5		1140		1						X	LEVEL IV QC
DUPE-7-2Q10	6		—		1						X	DUPLICATE
EB-14-05/19/10	7		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)

	Date	Time		Date	Time
Relinquished by: (Signature)	5/19/10	1238	Received by: (Signature)	5/19/10	1238
Relinquished by: (Signature)	5/19/10	1320	Received by: (Signature)	5/19/10	1320
Relinquished by: (Signature)			Received by: (Signature)		

Cooler / Blank / Ice / No Ice

Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001742

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001742-001.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-002.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-003.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-003.02					
		5/19/10	1330	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-004.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-005.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-006.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	
P1001742-007.01					
	7196A				
		5/19/10	1329	SMO / SSTAPLES	
		5/19/10	1430	In Lab / SANDERSON	
		5/19/10	1615	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001742

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/19/2010 Date opened: 5/19/2010 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
P1001742-001.01	125mL Plastic NP					
P1001742-002.01	125mL Plastic NP					
P1001742-003.01	125mL Plastic NP					
P1001742-003.02	125mL Plastic NP					
P1001742-004.01	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: P1001742

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/19/2010 Date opened: 5/19/2010 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1001742-005.01	125mL Plastic NP					
P1001742-006.01	125mL Plastic NP					
P1001742-007.01	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)

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DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001742
Date Collected : 05/19/10
Date Received : 05/19/10

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	P1001742-001	0.010	0.004	1	NA	05/19/10 15:40	ND	
MW-25-4	P1001742-002	0.010	0.004	1	NA	05/19/10 15:40	ND	
MW-25-3	P1001742-003	0.010	0.004	1	NA	05/19/10 15:40	ND	
MW-25-2	P1001742-004	0.010	0.004	1	NA	05/19/10 15:40	ND	
MW-25-1	P1001742-005	0.010	0.004	1	NA	05/19/10 15:40	ND	
DUPE-7-2Q10	P1001742-006	0.010	0.004	1	NA	05/19/10 15:40	ND	
EB-14-05/19/10	P1001742-007	0.010	0.004	1	NA	05/19/10 15:40	ND	
Method Blank	P1001742-MB	0.010	0.004	1	NA	05/19/10 15:40	ND	

Approved By Wida Ang Date : 5/20/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001742
Date Analyzed: 05/19/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Wida Ang Date: 5/20/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001742
Date Analyzed: 05/19/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0543	94	90-110
CCV1	0.0579	0.0553	96	90-110
CCV2	0.0579	0.0553	96	90-110

Approved By: Wida Ang Date: 5/20/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001742
Date Collected : 05/19/10
Date Received : 05/19/10
Date Extracted : NA
Date Analyzed : 05/19/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-25-3
Lab Code : P1001742-003MS P1001742-003DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0461	0.0472	92	94	78-112	2	

Approved By Wida Ang Date : 5/20/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001742
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/19/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001742-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0380	95	90-109	

Approved By Wida Ang Date : 5/20/10

Report By:SAnderson

CAS SR #P1001766

Table of Contents

Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 24, 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 20, 2010. For your reference, these analyses have been assigned our service request number P1001766.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001766

CASE NARRATIVE

The samples were received intact under chain of custody on May 20, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001766

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001766-001	MW-26-2	5/20/10	08:41
P1001766-002	MW-26-1	5/20/10	09:53
P1001766-003	EB-15-05/20/10	5/20/10	09:29

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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. P1001766

CAS Contact:

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

Project Name: JPL GW MON. 2Q10

Project Number: G-4486090

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)	Remarks
MW-26-2	1	5/20/10	0841	W	2							X	MS / MSD
MW-26-1	2		~~0903~~ 0953 (LB)		1							X	
EB-15-05/20/10	3		0929		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)	5/20/10	1230	Received by: (Signature)	5/20/10	1230
Relinquished by: (Signature)	5/20/10	1312	Received by: (Signature) WATCHMAN	5/20/10	1312
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. 2Q10/G486090

Service Request: P1001766

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001766-001.01					
	7196A				
		5/20/10	1318	SMO / MZAMORA	
		5/20/10	1319	P-37 / MZAMORA	
		5/20/10	1336	In Lab / SANDERSON	
		5/20/10	1653	P-37 / SANDERSON	
P1001766-001.02					
		5/20/10	1318	SMO / MZAMORA	
		5/20/10	1319	P-37 / MZAMORA	
		5/20/10	1336	In Lab / SANDERSON	
		5/20/10	1653	P-37 / SANDERSON	
P1001766-002.01					
	7196A				
		5/20/10	1318	SMO / MZAMORA	
		5/20/10	1319	P-37 / MZAMORA	
		5/20/10	1336	In Lab / SANDERSON	
		5/20/10	1653	P-37 / SANDERSON	
P1001766-003.01					
	7196A				
		5/20/10	1318	SMO / MZAMORA	
		5/20/10	1319	P-37 / MZAMORA	
		5/20/10	1336	In Lab / SANDERSON	
		5/20/10	1653	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001766

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/20/2010 Date opened: 5/20/2010 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
P1001766-001.01	125mL Plastic NP					
P1001766-001.02	125mL Plastic NP					
P1001766-002.01	125mL Plastic NP					
P1001766-003.01	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. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001766
Date Collected : 05/20/10
Date Received : 05/20/10

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	P1001766-001	0.010	0.004	1	NA	05/20/10 15:20	ND	
MW-26-1	P1001766-002	0.010	0.004	1	NA	05/20/10 15:20	ND	
EB-15-05/20/10	P1001766-003	0.010	0.004	1	NA	05/20/10 15:20	ND	
Method Blank	P1001766-MB	0.010	0.004	1	NA	05/20/10 15:20	ND	

Approved By Widadang Date : 5/24/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1001766
Project:	JPL GW Mon. 2Q10 / G486090	**Date Analyzed:**	05/20/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND

Approved By: Wida Ang Date: 5/24/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001766
Date Analyzed: 05/20/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0597	103	90-110
CCV1	0.0579	0.0597	103	90-110

Approved By: Wida Ang Date: 5/24/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001766
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/20/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001766-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0389	97	90-109	

Approved By WidaAng Date : 5/24/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001766
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	05/20/10
Project Number :	G486090	**Date Received :**	05/20/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/20/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-26-2		Units :	mg/L (ppm)
Lab Code :	P1001766-001MS	P1001766-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0498	0.0509	100	102	78-112	2	

Approved By Wida Ang Date : 5/24/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001675
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/13/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001675-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0395	99	90-109	

Approved By Wida Ang Date : 5/17/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001675
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	05/13/10
Project Number :	G486090	**Date Received :**	05/13/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/13/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-19-2 Units : mg/L (ppm)
Lab Code : P1001675-004MS P1001675-004DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0489	0.0489	98	98	78-112	<1	

Approved By Vida Ang Date : 5/17/10

Report By:SAnderson

CAS SR #P1001662

Table of Contents

Columbia Analytical Services™ 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 20, 2010

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

RE: JPL GW Mon 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 12, 2010. For your reference, these analyses have been assigned our service request number P1001662.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL GW Mon 2Q10 / G486090

CAS Project No: P1001662

CASE NARRATIVE

The samples were received intact under chain of custody on May 12, 2010 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.

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DOH or DHS	Department of Health Services
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GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
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ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
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MRL	Method Reporting Limit
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NA	Not Applicable
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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.

Client: Battelle
Project: JPL GW Mon 2Q10/G486090

Service Request: P1001662

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001662-001	MW-3-5	5/12/10	08:33
P1001662-002	MW-3-4	5/12/10	09:15
P1001662-003	MW-3-3	5/12/10	09:57
P1001662-004	MW-3-2	5/12/10	10:33
P1001662-005	MW-3-1	5/12/10	11:50
P1001662-006	DUPE-05-2Q10	5/12/10	00:00
P1001662-007	EB-10-05/12/10	5/12/10	11:31

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.: P1001662

CAS Contact:

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

Project Name: JRL GW MON 2Q10

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)	Remarks
MW-3-5	1	05/12/10	0833	W	1							X	
MW-3-4	2		0915		1							X	
MW-3-3	3		0957		1							X	
MW-3-2	4		1033		1							X	
MW-3-1	5		1150		1							X	
DUPE-05-2Q10	6		—		1							X	DUPLICATE
EB-10-05/12/10	7		1131		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)	5/14/10	1230	Received by: (Signature)	5/12/10	1230
Relinquished by: (Signature)	5/12/10	1847	Received by: (Signature)	5/13/10	0845
Relinquished by: (Signature)			Received by: (Signature)		

Cooler / Blank / Ice / No Ice

Temperature 3°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon 2Q10/G486090

Service Request: P1001662

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001662-001.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1509	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-002.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1510	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-003.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1509	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-004.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1509	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-005.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1510	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-006.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1510	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	
P1001662-007.01					
	7196A				
		5/12/10	1359	SMO / MZAMORA	
		5/12/10	1359	P-37 / MZAMORA	
		5/12/10	1510	In Lab / SANDERSON	
		5/12/10	1618	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001662

Project: JPL GW Mon 2Q10 / G486090

Sample(s) received on: 5/12/2010 Date opened: 5/12/2010 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
P1001662-001.01	125mL Plastic NP					
P1001662-002.01	125mL Plastic NP					
P1001662-003.01	125mL Plastic NP					
P1001662-004.01	125mL Plastic NP					
P1001662-005.01	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: P1001662

Project: JPL GW Mon 2Q10 / G486090

Sample(s) received on: 5/12/2010 Date opened: 5/12/2010 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1001662-006.01	125mL Plastic NP					
P1001662-007.01	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)

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DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001662
Date Collected : 05/12/10
Date Received : 05/12/10

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	P1001662-001	0.010	0.004	1	NA	05/12/10 15:55	ND	
MW-3-4	P1001662-002	0.010	0.004	1	NA	05/12/10 15:55	ND	
MW-3-3	P1001662-003	0.010	0.004	1	NA	05/12/10 15:55	ND	
MW-3-2	P1001662-004	0.010	0.004	1	NA	05/12/10 15:55	ND	
MW-3-1	P1001662-005	0.010	0.004	1	NA	05/12/10 15:55	ND	
DUPE-05-2Q10	P1001662-006	0.010	0.004	1	NA	05/12/10 15:55	ND	
EB-10-05/12/10	P1001662-007	0.010	0.004	1	NA	05/12/10 15:55	ND	
Method Blank	P1001662-MB	0.010	0.004	1	NA	05/12/10 15:55	ND	

Approved By Wida Ang Date : 5/14/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q10 / G486090

Service Request: P1001662
Date Analyzed: 05/12/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Wida Ang Date: 5/14/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q10 / G486090

Service Request: P1001662
Date Analyzed: 05/12/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0571	99	90-110
CCV1	0.0579	0.0571	99	90-110
CCV2	0.0579	0.0571	99	90-110

Approved By: Wida Ang Date: 5/14/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001662
Project Name :	JPL GW Mon 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/12/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001662-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0403	101	90-109	

Approved By Widafong Date : 5/14/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001662
Project Name :	JPL GW Mon 2Q10	**Date Collected :**	05/12/10
Project Number :	G486090	**Date Received :**	05/12/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/12/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-3-5
Lab Code : P1001662-001MS P1001662-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0455	0.0445	91	89	78-112	2	

Approved By Wida Ang Date : 5/14/10

Report By:SAnderson

CAS SR #P1001637

Table of Contents

Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 12, 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 11, 2010. For your reference, these analyses have been assigned our service request number P1001637.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001637

CASE NARRATIVE

The samples were received intact under chain of custody on May 11, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001637

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001637-001	MW-21-5	5/11/10	08:08
P1001637-002	MW-21-4	5/11/10	08:41
P1001637-003	MW-21-3	5/11/10	09:14
P1001637-004	MW-21-2	5/11/10	09:47
P1001637-005	MW-21-1	5/11/10	10:25
P1001637-006	EB-09-05/11/10	5/11/10	10:10

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. P1001637

CAS Contact:

Company Name & Address (Reporting Information)	BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110
Project Name	JPL GW MON. 2Q10
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)	Remarks
MW-21-5	1	05/11/10	0808	W	1							X	
MW-21-4	2		0841		1							X	
MW-21-3	3		0914		1							X	
MW-21-2	4		0947		1							X	
MW-21-1	5		1025		1							X	LEVEL IV QC
EB-09-05/11/10	6		1010		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)	05/11/10	1200	Received by: (Signature)	5/11/10	1200
Relinquished by: (Signature)	5/11/10	12:45	Received by: (Signature)	5/11/10	12:45
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. 2Q10/G486090

Service Request: P1001637

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001637-001.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	
P1001637-002.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	
P1001637-003.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	
P1001637-004.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	
P1001637-005.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	
P1001637-006.01					
	7196A				
		5/11/10	1318	SMO / MZAMORA	
		5/11/10	1318	P-37 / MZAMORA	
		5/11/10	1459	In Lab / SANDERSON	
		5/11/10	1633	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001637

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/11/2010 Date opened: 5/11/2010 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
P1001637-001.01	125mL Plastic NP					
P1001637-002.01	125mL Plastic NP					
P1001637-003.01	125mL Plastic NP					
P1001637-004.01	125mL Plastic NP					
P1001637-005.01	125mL Plastic NP					
P1001637-006.01	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. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001637
Date Collected : 05/11/10
Date Received : 05/11/10

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	P1001637-001	0.010	0.004	1	NA	05/11/10 16:15	ND	
MW-21-4	P1001637-002	0.010	0.004	1	NA	05/11/10 16:15	ND	
MW-21-3	P1001637-003	0.010	0.004	1	NA	05/11/10 16:15	ND	
MW-21-2	P1001637-004	0.010	0.004	1	NA	05/11/10 16:15	ND	
MW-21-1	P1001637-005	0.010	0.004	1	NA	05/11/10 16:15	ND	
EB-09-05/11/10	P1001637-006	0.010	0.004	1	NA	05/11/10 16:15	ND	
Method Blank	P1001637-MB	0.010	0.004	1	NA	05/11/10 16:15	ND	

Approved By Dida Ang Date : 5/12/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001637
Date Analyzed: 05/11/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Widdang Date: 5/12/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001637
Date Analyzed: 05/11/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0569	98	90-110
CCV1	0.0579	0.0569	98	90-110
CCV2	0.0579	0.0569	98	90-110

Approved By: Widafang Date: 5/12/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001637
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/11/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001637-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0400	100	90-109	

Approved By Widdang Date : 5/12/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001637
Date Collected : 05/11/10
Date Received : 05/11/10
Date Extracted : NA
Date Analyzed : 05/11/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-21-5
Lab Code : P1001637-001MS P1001637-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0495	0.0495	99	99	78-112	<1	

Approved By Wida Ang Date : 5/12/10

Report By:SAnderson

CAS SR #P1001626

Table of Contents

Columbia Analytical Services™ 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 12 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 10, 2010. For your reference, these analyses have been assigned our service request number P1001626.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001626

CASE NARRATIVE

The samples were received intact under chain of custody on May 10, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001626

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001626-001	MW-20-5	5/10/10	08:30
P1001626-002	MW-20-4	5/10/10	09:10
P1001626-003	MW-20-3	5/10/10	09:45
P1001626-004	MW-20-2	5/10/10	10:19
P1001626-005	MW-20-1	5/10/10	11:18
P1001626-006	DUPE-04-2Q10	5/10/10	00:00
P1001626-007	EB-08-5/10/10	5/10/10	11:04

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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. P1001626

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 2Q10 Project Number G4860900
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 II (7196)	Remarks
MW-20-5	1	05/10/10	0830	W	1							X	
MW-20-4	2		0910		1							X	
MW-20-3	3		0945		1							X	
MW-20-2	4		1019		1							X	
MW-20-1	5		1118		1							X	
DUPE-04-2Q10	6		—		1							X	DUPLICATE6
EB-04-5-/10/10	7		1104		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: 5/10/10	Time: 1230	Received by: (Signature)		Date: 5/10/10	Time: 1230	
Relinquished by: (Signature)	Date: 5/10/10	Time: 1347	Received by: (Signature)		Date: 5/10/10	Time: 1347	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. 2Q10/G486090

Service Request: P1001626

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001626-001.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-002.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-003.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-004.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-005.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-006.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	
P1001626-007.01					
	7196A				
		5/10/10	1426	SMO / MZAMORA	
		5/10/10	1427	P-37 / MZAMORA	
		5/10/10	1431	In Lab / SANDERSON	
		5/10/10	1740	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001626

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/10/2010 Date opened: 5/10/2010 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
P1001626-001.01	125mL Plastic NP					
P1001626-002.01	125mL Plastic NP					
P1001626-003.01	125mL Plastic NP					
P1001626-004.01	125mL Plastic NP					
P1001626-005.01	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)

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001626

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/10/2010 Date opened: 5/10/2010 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1001626-006.01	125mL Plastic NP					
P1001626-007.01	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)

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DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001626
Date Collected : 05/10/10
Date Received : 05/10/10

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	P1001626-001	0.010	0.004	1	NA	05/10/10 15:45	ND	
MW-20-4	P1001626-002	0.010	0.004	1	NA	05/10/10 15:45	ND	
MW-20-3	P1001626-003	0.010	0.004	1	NA	05/10/10 15:45	ND	
MW-20-2	P1001626-004	0.010	0.004	1	NA	05/10/10 15:45	ND	
MW-20-1	P1001626-005	0.010	0.004	1	NA	05/10/10 15:45	ND	
DUPE-04-2Q10	P1001626-006	0.010	0.004	1	NA	05/10/10 15:45	ND	
EB-08-5/10/10	P1001626-007	0.010	0.004	1	NA	05/10/10 15:45	ND	
Method Blank	P1001626-MB	0.010	0.004	1	NA	05/10/10 15:45	ND	

Approved By Wida Ang Date : 5/12/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001626
Date Analyzed: 05/10/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Wida Ang Date: 5/12/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001626
Date Analyzed: 05/10/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0573	99	90-110
CCV1	0.0579	0.0583	101	90-110
CCV2	0.0579	0.0573	99	90-110

Approved By: Wida Ang Date: 5/12/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001626
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/10/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001626-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0405	101	90-109	

Approved By Wida Ang Date : 5/12/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001626
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	05/10/10
Project Number :	G486090	**Date Received :**	05/10/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/10/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-20-5
Lab Code : P1001626-001MS P1001626-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0437	0.0437	87	87	78-112	<1	

Approved By Widyang Date : 5/12/10

Report By:SAnderson

Columbia Analytical Services INC 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

CAS SR #P1001593

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Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 10, 2010

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

RE: JPL-GW-2Q10 / G005862/JPL GWM

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 6, 2010. For your reference, these analyses have been assigned our service request number P1001593.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL-GW-2Q10 / G005862/JPL GWM

CAS Project No: P1001593

CASE NARRATIVE

The samples were received intact under chain of custody on May 6, 2010 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.

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.

Client: Battelle
Project: JPL-GW-2Q10/G005862/JPL GWM

Service Request: P1001593

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001593-001	MW-9	5/6/10	11:11
P1001593-002	MW-1	5/6/10	14:53
P1001593-003	DUPE-8-2Q10	5/6/10	14:54

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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. P1001593

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number
Battelle 505 King Ave Columbus OH 43201	JPL-GW-2010	60058G2/JPL GW/M

Project Manager	P.O. # / Billing Information
David Conner	214375 / Battelle ATTN: Jerry Tompkins 505 King Ave Columbus OH 43201

Phone	Fax
619 726-7311	614 458-6641

Email Address for Result Reporting	Sampler (Print & Sign)
connerd@battelle.org	David Conner / David C

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)	Hexavalent Cr (7196A) 0	Remarks
MW-9	(1)	5/6/10	1111	AQ	1P							X	
MW-1	(2)	5/6/10	1453	AQ	1P							X	
MW-DUPE-8-2010	(3)	5/6/10	1454	AQ	1P							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 X
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:
David Conner	5/6/10	1300		5/6/10	1500
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/6/10	15:50		5/6/10	1550
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3.0 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL-GW-2Q10/G005862/JPL GWM

Service Request: P1001593

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001593-001.01					
	7196A				
		5/6/10	1604	SMO / MZAMORA	
		5/6/10	1604	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001593-002.01					
	7196A				
		5/6/10	1604	SMO / MZAMORA	
		5/6/10	1604	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001593-003.01					
	7196A				
		5/6/10	1604	SMO / MZAMORA	
		5/6/10	1604	P-37 / MZAMORA	
		5/6/10	1620	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001593

Project: JPL-GW-2Q10 / G005862/JPL GWM

Sample(s) received on: 5/6/2010 Date opened: 5/6/2010 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
P1001593-001.01	125mL Plastic NP					
P1001593-002.01	125mL Plastic NP					
P1001593-003.01	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-2Q10
Project Number : G005862/JPL GWM
Sample Matrix : WATER

Service Request : P1001593
Date Collected : 05/06/10
Date Received : 05/06/10

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-9	P1001593-001	0.010	0.004	1	NA	05/06/10 17:25	ND	
MW-1	P1001593-002	0.010	0.004	1	NA	05/06/10 17:25	ND	
DUPE-8-2Q10	P1001593-003	0.010	0.004	1	NA	05/06/10 17:25	ND	
Method Blank	P1001593-MB	0.010	0.004	1	NA	05/06/10 17:25	ND	

Approved By Karen Rya Date : 5/7/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1001593
Project:	JPL-GW-2Q10 / G005862/JPL GWM	**Date Analyzed:**	05/06/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Karen Ryan Date: 5/7/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q10 / G005862/JPL GWM

Service Request: P1001593
Date Analyzed: 05/06/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0566	98	90-110
CCV1	0.0579	0.0556	96	90-110
CCV2	0.0579	0.0566	98	90-110

Approved By: Karen Rya Date: 5/7/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001593
Project Name :	JPL-GW-2Q10	**Date Collected :**	NA
Project Number :	G005862/JPL GWM	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/06/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001593-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0379	95	90-109	

Approved By Karen Ryan Date : 5/7/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001593
Project Name :	JPL-GW-2Q10	**Date Collected :**	05/06/10
Project Number :	G005862/JPL GWM	**Date Received :**	05/06/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/06/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-9		Units :	mg/L (ppm)
Lab Code :	P1001593-001MS	P1001593-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0452	0.0462	90	92	78-112	2	

Approved By Karen Ryan Date : 5/7/10

Report By:SAnderson

CAS SR #P1001592

Table of Contents

Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 10, 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 6, 2010. For your reference, these analyses have been assigned our service request number P1001592.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001592

CASE NARRATIVE

The samples were received intact under chain of custody on May 6, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001592

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001592-001	MW-11-5	5/6/10	08:20
P1001592-002	MW-11-4	5/6/10	09:15
P1001592-003	MW-11-3	5/6/10	09:54
P1001592-004	MW-11-2	5/6/10	10:30
P1001592-005	MW-11-1	5/6/10	11:30
P1001592-006	EB-7-05/06/10	5/6/10	11:15

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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. P1001592

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Manager	Phone	Fax
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 2Q10 Project Number G4860090	DAVID CONNER	(619)726-7311	

P.O. # / Billing Information
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 IH (7196)	Remarks
MW-11-5	1	5/6/10	0820	W	1							X	
MW-11-4	2		0915		1							X	
MW-11-3	3		0954		1							X	
MW-11-2	4		1030		2							X	MS/MSD
MW-11-1	5		1130		1							X	
EB-7-05/06/10	6		1115		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:
	5/6/10	1500		5/6/10	1500
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/6/10	1550		5/6/10	1550
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3.0 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001592

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001592-001.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-002.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-003.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-004.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-004.02					
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-005.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1619	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	
P1001592-006.01					
	7196A				
		5/6/10	1555	SMO / MZAMORA	
		5/6/10	1556	P-37 / MZAMORA	
		5/6/10	1620	In Lab / SANDERSON	
		5/6/10	1731	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001592

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/6/2010 Date opened: 5/6/2010 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
P1001592-001.01	125mL Plastic NP					
P1001592-002.01	125mL Plastic NP					
P1001592-003.01	125mL Plastic NP					
P1001592-004.01	125mL Plastic NP					
P1001592-004.02	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)

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001592

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/6/2010 Date opened: 5/6/2010 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1001592-005.01	125mL Plastic NP					
P1001592-006.01	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)

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DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon. 2Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1001592
Date Collected : 05/06/10
Date Received : 05/06/10

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	P1001592-001	0.010	0.004	1	NA	05/06/10 17:25	ND	
MW-11-4	P1001592-002	0.010	0.004	1	NA	05/06/10 17:25	ND	
MW-11-3	P1001592-003	0.010	0.004	1	NA	05/06/10 17:25	ND	
MW-11-2	P1001592-004	0.010	0.004	1	NA	05/06/10 17:25	ND	
MW-11-1	P1001592-005	0.010	0.004	1	NA	05/06/10 17:25	ND	
EB-7-05/06/10	P1001592-006	0.010	0.004	1	NA	05/06/10 17:25	ND	
Method Blank	P1001592-MB	0.010	0.004	1	NA	05/06/10 17:25	ND	

Approved By Karen Ryan Date : 5/7/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001592
Date Analyzed: 05/06/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Karen Ryan Date: 5/7/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

Service Request: P1001592
Date Analyzed: 05/06/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0566	98	90-110
CCV1	0.0579	0.0556	96	90-110
CCV2	0.0579	0.0566	98	90-110

Approved By: Karen Ryan Date: 5/7/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001592
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/06/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001592-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0379	95	90-109	

Approved By Karen Ryan Date : 5/7/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001592
Project Name :	JPL GW Mon. 2Q10	**Date Collected :**	05/06/10
Project Number :	G486090	**Date Received :**	05/06/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/06/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-11-2		Units :	mg/L (ppm)
Lab Code :	P1001592-004MS	P1001592-004DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0462	0.0462	92	92	78-112	<1	

Approved By Karen Ryan Date : 5/7/10

Report By:SAnderson

CAS SR #P1001573

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Columbia Analytical Services, Inc. 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

May 10, 2010

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

RE: JPL-GW-2Q10 / G005862/JPL GWM

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 5, 2010. For your reference, these analyses have been assigned our service request number P1001573.

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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. 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

Client: Battelle
Project: JPL-GW-2Q10 / G005862/JPL GWM

CAS Project No: P1001573

CASE NARRATIVE

The samples were received intact under chain of custody on May 5, 2010 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.

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.

Client: Battelle
Project: JPL-GW-2Q10/G005862/JPL GWM

Service Request: P1001573

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001573-001	MW-5	5/5/10	09:14
P1001573-002	MW-10	5/5/10	11:54

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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. P1001573

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	Project Manager	P.O. # / Billing Information
Battelle 505 King Ave Columbus OH 43201	JPL-GW-2010	6005862/JPL GWM	David Conner	214375/ Battelle ATTN: Jerry Tompkins 505 King Ave Columbus OH 43201

Phone	Fax	Email Address for Result Reporting	Sampler (Print & Sign)
619 726-7311	614 458-6641	connerd@battelle.org	David Loera / David L

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 (Hexavalent Cr (7196A))	Remarks
MW-5	1	5/5/10	0914	AQ	1P						X	
MW-10	2	5/5/10	1154	AQ	1P						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 X
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) David L	Date: 5/5/10	Time: 1230	Received by: (Signature)	Date: 5/5/10	Time: 1235	Cooler / Blank / Ice / No Ice	
Relinquished by: (Signature)	Date: 5/5/10	Time: 1300	Received by: (Signature)	Date: 5/5/10	Time: 1300		
Relinquished by: (Signature)	Date: 5/5/10	Time: 1340	Received by: (Signature)	Date: 5/5/10	Time: 1340	Temperature 3 °C	°C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL-GW-2Q10/G005862/JPL GWM

Service Request: P1001573

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001573-001.01					
	7196A				
		5/5/10	1415	SMO / MZAMORA	
		5/5/10	1415	P-37 / MZAMORA	
		5/5/10	1428	In Lab / SANDERSON	
		5/5/10	1716	P-37 / SANDERSON	
P1001573-002.01					
	7196A				
		5/5/10	1415	SMO / MZAMORA	
		5/5/10	1415	P-37 / MZAMORA	
		5/5/10	1428	In Lab / SANDERSON	
		5/5/10	1716	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001573

Project: JPL-GW-2Q10 / G005862/JPL GWM

Sample(s) received on: 5/5/2010 Date opened: 5/5/2010 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
P1001573-001.01	125mL Plastic NP					
P1001573-002.01	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-2Q10
Project Number : G005862/JPL GWM
Sample Matrix : WATER

Service Request : P1001573
Date Collected : 05/05/10
Date Received : 05/05/10

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-5	P1001573-001	0.010	0.004	1	NA	05/05/10 16:00	ND	
MW-10	P1001573-002	0.010	0.004	1	NA	05/05/10 16:00	ND	
Method Blank	P1001573-MB	0.010	0.004	1	NA	05/05/10 16:00	ND	

Approved By Karen Ryan Date : 5/6/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q10 / G005862/JPL GWM

Service Request: P1001573
Date Analyzed: 05/05/10

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Karen Ryan Date: 5/6/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q10 / G005862/JPL GWM

Service Request: P1001573
Date Analyzed: 05/05/10

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0565	98	90-110
CCV1	0.0579	0.0575	99	90-110
CCV2	0.0579	0.0575	99	90-110

Approved By: Karen Ryan Date: 5/10/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1001573
Project Name :	JPL-GW-2Q10	**Date Collected :**	NA
Project Number :	G005862/JPL GWM	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	05/05/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1001573-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0397	99	90-109	

Approved By Karen Ryan Date : 5/6/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL-GW-2Q10
Project Number : G005862/JPL GWM
Sample Matrix : WATER

Service Request : P1001573
Date Collected : 05/05/10
Date Received : 05/05/10
Date Extracted : NA
Date Analyzed : 05/05/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-5
Lab Code : P1001573-001MS P1001573-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0481	0.0481	96	96	78-112	<1	

Approved By Karen Ryan Date : 5/6/10

Report By:SAnderson

CAS SR #P1001729

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Columbia Analytical Services™ 2655 Park Center Drive, Suite A | Simi Valley, CA 93065 | 805.526.7161 | 805.526.7270 fax | www.caslab.com

LABORATORY REPORT

June 14, 2010

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

RE: JPL GW Mon. 2Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 18, 2010. One of the samples was sent out for partial analysis to our Kelso facilty. Please find their report attached. For your reference, these analyses have been assigned our service request number P1001729.

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 264 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; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. 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

Client: Battelle
Project: JPL GW Mon. 2Q10 / G486090

CAS Project No: P1001729

CASE NARRATIVE

The samples were received intact under chain of custody on May 18, 2010 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.

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.

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1001729-001	MW-17-5	5/18/10	09:06
P1001729-002	MW-17-4	5/18/10	09:43
P1001729-003	MW-17-3	5/18/10	11:00
P1001729-004	MW-17-2	5/18/10	11:37
P1001729-005	MW-17-1	5/18/10	12:20
P1001729-006	DUPE-6-2Q10	5/18/10	00:00
P1001729-007	EB-13-05/18-10	5/18/10	12:04

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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. P1001729

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	P.O. # / Billing Information
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 2Q10 Project Number G486090	214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE COLUMBUS OH 43201
Project Manager: DAVID CONNER		
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)	D CR VII (7196)	O 1,4 - Dioxane (8270)	O NDMA (1625.0)	Remarks
mw-17-5	1	5/18/10	0906	W	1						X			LEVEL IV QC
mw-17-4	2		0943		4						X	X	X	
mw-17-3	3		1100		1						X			
mw-17-2	4		1137		1						X			
mw-17-1	5		1220		1						X			LEVEL IV QC
DUPE-6-2Q10	6		—		1						X			LEVEL IV QC, DUPLICA
EB-13-05/18/10	7		1204		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)

	Date	Time		Date	Time
Relinquished by: (Signature)	5/18/10	1400	Received by: (Signature)	5/18/10	1400
Relinquished by: (Signature)	5/18/10	1835	Received by: (Signature)	05/18/10	1835
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. 2Q10/G486090

Service Request: P1001729

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1001729-001.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	
P1001729-002.01					
	521				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1500	SUBBED / SSTAPLES	
		5/20/10	1628	K-Delilah-76 / LKENNEDY	
		5/27/10	0805	Custodian / DMOORE	
		5/27/10	0805	In Lab / RHAYES	
		5/28/10	0850	K-Delilah-76 / DHEATON	
P1001729-002.02					
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1500	SUBBED / SSTAPLES	
		5/20/10	1628	K-Delilah-76 / LKENNEDY	
P1001729-002.03					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	
P1001729-002.04					
	8270C SIM				
		5/18/10	1447	SMO / SSTAPLES	
		5/19/10	1520	SUBBED / MZAMORA	
		5/20/10	1628	K-Delilah-76 / LKENNEDY	
		5/21/10	0711	In Lab / RHOLDEN	
		5/21/10	1400	K-Delilah-76 / SDAVIS	
P1001729-003.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	
P1001729-004.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	
P1001729-005.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	

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Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL GW Mon. 2Q10/G486090

Service Request: P1001729

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		5/19/10	1351	P-37 / SANDERSON	
P1001729-006.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	
P1001729-007.01					
	7196A				
		5/18/10	1447	SMO / SSTAPLES	
		5/18/10	1558	In Lab / SANDERSON	
		5/19/10	1351	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P1001729

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/18/2010 Date opened: 5/18/2010 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 3 °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
P1001729-001.01	125mL Plastic NP					
P1001729-002.01	1000ml AG NP					
P1001729-002.02	1000ml AG NP					
P1001729-002.03	500mL Plastic NP					
P1001729-002.04	500mL 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: P1001729

Project: JPL GW Mon. 2Q10 / G486090

Sample(s) received on: 5/18/2010 Date opened: 5/18/2010 by: SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1001729-003.01	125mL Plastic NP					
P1001729-004.01	125mL Plastic NP					
P1001729-005.01	125mL Plastic NP					
P1001729-006.01	125mL Plastic NP					
P1001729-007.01	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)

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DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS