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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 4, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 3, 2009. For your reference, these analyses have been assigned our service request number P0900363.

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 23 pages.

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900363
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 3, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900363

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900363-001	MW-12-3	2/3/09	10:05
P0900363-002	MW-12-2	2/3/09	10:33
P0900363-003	MW-12-1	2/3/09	11:01
P0900363-004	EB-08-02/03/09	2/3/09	10:20

Acronyms

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

Qualifiers

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

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

Page 1 of 1

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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. P0100363

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	JPL GW MON 1Q09
Project Manager	**Project Number**
DAVID CONNER	G486090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	1												Remarks
												Cr VI (7196)												
MW-12-3	1	2/3/09	1005	W	1							X												
MW-12-2	2	"	1033	"	"							X												
MW-12-1	3	"	1101	"	"							X												QC LEVEL IV
EB-08-02/03/09	4	"	1020	"	"							X												EQUIP. 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) X

MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	2/3/09	1155			
	2/3/09	13:10	Received by: (Signature) Ultramar	2/3/09	1310
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

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

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900363

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900363-001.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1321	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-002.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1320	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-003.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1320	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-004.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1321	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900363

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 02/03/09 Date opened: 02/03/09 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900363-001.01	125mL Plastic NP					
P0900363-002.01	125mL Plastic NP					
P0900363-003.01	125mL Plastic NP					
P0900363-004.01	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)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900363
Date Collected : 02/03/09
Date Received : 02/03/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-3	P0900363-001	0.010	0.006	1	NA	02/03/09 14:40	ND	
MW-12-2	P0900363-002	0.010	0.006	1	NA	02/03/09 14:40	ND	
MW-12-1	P0900363-003	0.010	0.006	1	NA	02/03/09 14:40	ND	
EB-08-02/03/09	P0900363-004	0.010	0.006	1	NA	02/03/09 14:40	ND	
Method Blank	P0900363-MB	0.010	0.006	1	NA	02/03/09 14:40	ND	

Approved By Sue Anderson Date : 2/4/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900363
Date Analyzed: 02/03/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: _____ Date: 2/4/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900363
Date Analyzed: 02/03/09

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
ICV	0.0418	0.0403	96
CCV1	0.0418	0.0413	99

Approved By: _____ Date: 2/4/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900363
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/03/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900363-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	0.0392	98	92-113	

Approved By Sue Anderson Date : 2/4/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900363
Date Collected : 02/03/09
Date Received : 02/03/09
Date Extracted : NA
Date Analyzed : 02/03/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-12-3
Lab Code : P0900363-001MS P0900363-001DMS
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	0.0529	0.0529	106	106	82-114	<1	

Approved By Sue Anderson Date : 2/4/09

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0900382

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Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 6, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 4, 2009. For your reference, these analyses have been assigned our service request number P0900382.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Sue Anderson
Project Manager

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Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900382
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 4, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900382

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900382-001	MW-3-4	2/4/09	09:34
P0900382-002	MW-3-3	2/4/09	10:01
P0900382-003	MW-3-2	2/4/09	10:42
P0900382-004	DUPE-5-1Q09	2/4/09	00:00
P0900382-005	MW-4-3	2/4/09	07:26
P0900382-006	MW-4-2	2/4/09	07:46
P0900382-007	MW-4-1	2/4/09	08:12
P0900382-008	EB-09-02/04/09	2/4/09	08:02

Acronyms

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

Qualifiers

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

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

Page 1 of 1

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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. 1090358

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	SPL GW MON 1Q09
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 2143A / 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-3-4	1	2/4/09	~~934~~ 0934 @	W	1							X		
MW-3-3	2		1001		1							X		
MW-3-2	3		1042		2							X		MS/MSD
DUPE-5-1Q09	4				1							X		DUPLICATE
MW-4-3	5		~~726~~ 0726 @									X		COLLECTED AT 0726
MW-4-2	6		746									X		
MW-4-1	7		812									X		
EB-09-02/04/09	8		802									X		EQUIP. 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) X

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

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	2/4/09	1231	Received by: (Signature)	2/4/09	1231
Relinquished by: (Signature)	2-4-09	1518	Received by: (Signature)	2/4/09	1810
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 Groundwater Monitoring 1Q09/G486090

Service Request: P0900382

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900382-001.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-002.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1654	P-37 / NFALLAHI	
P0900382-003.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-003.02					
		2/4/09	1324	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-004.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1654	P-37 / NFALLAHI	
P0900382-005.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-006.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-007.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-008.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	

6

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900382

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	

7

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900382

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/4/09 Date opened: 2/4/09 by: LKUKITA

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
P0900382-001.01	125mL Plastic NP					
P0900382-002.01	125mL Plastic NP					
P0900382-003.01	125mL Plastic NP					
P0900382-003.02	125mL Plastic NP					
P0900382-004.01	125mL Plastic NP					
P0900382-005.01	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: P0900382

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/4/09 Date opened: 2/4/09 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900382-006.01	125mL Plastic NP					
P0900382-007.01	125mL Plastic NP					
P0900382-008.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900382
Date Collected : 02/04/09
Date Received : 02/04/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-3-4	P0900382-001	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-3-3	P0900382-002	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-3-2	P0900382-003	0.010	0.006	1	NA	02/04/09 15:30	ND	
DUPE-5-1Q09	P0900382-004	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-3	P0900382-005	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-2	P0900382-006	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-1	P0900382-007	0.010	0.006	1	NA	02/04/09 15:30	ND	
EB-09-02/04/09	P0900382-008	0.010	0.006	1	NA	02/04/09 15:30	ND	
Method Blank	P0900382-MB	0.010	0.006	1	NA	02/04/09 15:30	ND	

Approved By Sue Anderson Date : 2/6/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900382
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/04/09

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	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Approved By: Joe Anderson Date: 2/6/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900382
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/04/09

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
ICV	0.0418	0.0418	100
CCV1	0.0418	0.0429	103
CCV2	0.0418	0.0418	100

Approved By: _____ Date: 2/6/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900382
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/04/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900382-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	92-113	

Approved By _____ Date : 2/6/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900382
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/04/09
Project Number :	G486090	**Date Received :**	02/04/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/04/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-3-2 Units : mg/L (ppm)
Lab Code : P0900382-003MS P0900382-003DMS 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	0.0533	0.0533	107	107	82-114	<1	

Approved By _____ Date : 2/6/09

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0900415

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 6, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 5, 2009. For your reference, these analyses have been assigned our service request number P0900415.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900415
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900415

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900415-001	MW-22-3	2/5/09	07:58
P0900415-002	MW-22-2	2/5/09	08:25
P0900415-003	MW-22-1	2/5/09	08:54
P0900415-004	MW-11-3	2/5/09	10:43
P0900415-005	MW-11-2	2/5/09	11:08
P0900415-006	MW-11-1	2/5/09	11:56
P0900415-007	EB-10-02/05/09	2/5/09	08:42

Acronyms

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

Qualifiers

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

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

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. 20C0415

CAS Contact:

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

Project Name
JPL GW MON 1Q09

Project Number
G486090

Project Manager
DAVID CONNET

P.O. # / Billing Information
21439/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	Remarks
MW-22-3	1	2/5/09	0758	W	1							X	
MW-22-2	2		0825									X	
MW-22-1	3		0854									X	
MW-11-3	4		1043									X	
MW-11-2	5		1108									X	
MW-11-1	6		1156									X	
SB-10-02/05/09	7		0842									X	EQUIPMENT BLANK

C of C (7196)

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) X

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

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 2/05/09	Time: 1300	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)		Date: 2/5/09	Time: 1811	Received by: (Signature)	Date: 2/5/09	Time: 1405
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 Groundwater Monitoring 1Q09/G486090

Service Request: P0900415

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900415-001.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-002.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-003.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-004.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-005.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1644	P-37 / LKUKITA	
P0900415-006.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-007.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1644	P-37 / LKUKITA	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900415

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/5/09 Date opened: 2/5/09 by: LKUKITA

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
P0900415-001.01	125mL Plastic NP					
P0900415-002.01	125mL Plastic NP					
P0900415-003.01	125mL Plastic NP					
P0900415-004.01	125mL Plastic NP					
P0900415-005.01	125mL Plastic NP					
P0900415-006.01	125mL Plastic NP					

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

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

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900415

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/5/09 Date opened: 2/5/09 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900415-007.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900415
Date Collected : 02/05/09
Date Received : 02/05/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-22-3	P0900415-001	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-22-2	P0900415-002	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-22-1	P0900415-003	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-3	P0900415-004	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-2	P0900415-005	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-1	P0900415-006	0.010	0.006	1	NA	02/05/09 15:50	ND	
EB-10-02/05/09	P0900415-007	0.010	0.006	1	NA	02/05/09 15:50	ND	
Method Blank	P0900415-MB	0.010	0.006	1	NA	02/05/09 15:50	ND	

Approved By Sue Anderson Date : 2/6/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900415
Date Analyzed: 02/05/09

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	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Approved By: _____ Date: 2/6/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900415
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/05/09

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
ICV	0.0418	0.0403	96
CCV1	0.0418	0.0392	94
CCV2	0.0418	0.0392	94

Approved By: _____ Date: 2/6/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900415
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/05/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900415-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	0.0382	96	92-113	

Approved By Sue Anderson Date : 2/6/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900415
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/05/09
Project Number :	G486090	**Date Received :**	02/05/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/05/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-22-3
Lab Code : P0900415-001MS P0900415-001DMS
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	0.0494	0.0484	99	97	82-114	2	

Approved By _____ Date : 2/6/09

Report By:NFallahi

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

Columbia Analytical Services INC
An Employee - Owned Company

CAS SR #P0900459

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Columbia Analytical Services INC.
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LABORATORY REPORT

February 10, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 9, 2009. For your reference, these analyses have been assigned our service request number P0900459.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900459
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 9, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900459

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900459-001	MW-23-4	2/9/09	08:25
P0900459-002	MW-23-3	2/9/09	08:58
P0900459-003	MW-23-2	2/9/09	09:59
P0900459-004	MW-23-1	2/9/09	10:41
P0900459-005	EB-11-02/09/09	2/9/09	10:20
P0900459-006	SB-01-1Q09	2/9/09	10:25

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC.
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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.

CAS Contact:

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

Project Name
JPL GW MON 1Q09

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	Remarks
MW-23-4		02/09/09	0825	W	1						X	
MW-23-3			0858		2						X	MS/MSD
MW-23-2			0959		1						X	
MW-23-1			1041		1						X	
EB-11-02/09/09			1020		1						X	EQUIPMENT BLANK
~~TB-11-02/09/09~~ (EB)	—	—	—	—	—						—	—
SB-01-1209			1025		1						X	SOURCE BLANK

Cr VI (7191)

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) X

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

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date: 02/09/09	Time: 1730	Received by: (Signature)	Date: 2/10/09	Time: 1130
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

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

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900459

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900459-001.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-002.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-002.02					
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-003.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-004.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-005.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	
P0900459-006.01					
	7196A				
		2/9/09	1236	SMO / LKUKITA	
		2/9/09	1249	In Lab / NFALLAHI	
		2/9/09	1619	P-37 / NFALLAHI	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900459

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/9/09 Date opened: 2/9/09 by: LKUKITA

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
P0900459-001.01	125mL Plastic NP					
P0900459-002.01	125mL Plastic NP					
P0900459-002.02	125mL Plastic NP					
P0900459-003.01	125mL Plastic NP					
P0900459-004.01	125mL Plastic NP					
P0900459-005.01	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: P0900459

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/9/09 Date opened: 2/9/09 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900459-006.01	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 Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900459
Date Collected : 02/09/09
Date Received : 02/09/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-4	P0900459-001	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-3	P0900459-002	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-2	P0900459-003	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-1	P0900459-004	0.010	0.006	1	NA	02/09/09 16:30	ND	
EB-11-02/09/09	P0900459-005	0.010	0.006	1	NA	02/09/09 16:30	ND	
SB-01-1Q09	P0900459-006	0.010	0.006	1	NA	02/09/09 16:30	ND	
Method Blank	P0900459-MB	0.010	0.006	1	NA	02/09/09 16:30	ND	

Approved By Sue Anderson Date : 2/10/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900459
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/09/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: Sue Anderson Date: 2/10/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900459
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/09/09

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
ICV	0.0418	0.0438	105
CCV1	0.0418	0.0438	105

Approved By: _____ Date: 2/10/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900459
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/09/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900459-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	0.0419	105	92-113	

Approved By Sue Anderson Date : 2/10/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900459
Date Collected : 02/09/09
Date Received : 02/09/09
Date Extracted : NA
Date Analyzed : 02/09/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-23-3
Lab Code : P0900459-002MS P0900459-002DMS
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	0.0541	0.0541	108	108	82-114	<1	

Approved By Sue Anderson Date : 2/10/09

Report By:NFallahi

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

Columbia Analytical Services INC.
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CAS SR #P0900480

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 19, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 10, 2009. For your reference, these analyses have been assigned our service request number P0900480.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900480
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 9, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900480

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900480-001	MW-7	2/10/09	09:55
P0900480-002	MW-16	2/10/09	12:20
P0900480-003	DUPE-06-1Q08	2/10/09	00:00

Acronyms

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

Qualifiers

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

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

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No.: P0900450

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	P.O. # / Billing Information
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 1Q09	G486090	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE COLUMBUS, OH 43201

Project Manager	Phone	Fax
DAVID CONNER	619-726-7311	

Email Address for Result Reporting:

Sampler (Print & Sign):

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7196)	Remarks
MW-7	1	2/10/09	0955	W	1							X		
MW-16	2	"	1220	"	2							X		MS/MSD
DUPE-05-1208 06	3	"	—	"	1							X		DUPLICATE

per D. Mendoza 2/13/09

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: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	2/10/09	1800		2/10/09	1800
	2/10/09	1345		2/10/09	1345
	Date:	Time:		Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 2.0 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle **Service Request:** P0900480
Project: JPL Groundwater Monitoring 1Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900480-001.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-002.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-002.02					
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-003.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900480

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 02/10/09 Date opened: 02/10/09 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900480-001.01	125mL Plastic NP					
P0900480-002.01	125mL Plastic NP					
P0900480-002.02	125mL Plastic NP					
P0900480-003.01	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 Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900480
Date Collected : 02/10/09
Date Received : 02/10/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-7	P0900480-001	0.010	0.006	1	NA	02/10/09 15:35	ND	
MW-16	P0900480-002	0.010	0.006	1	NA	02/10/09 15:35	ND	
DUPE-06-1Q08	P0900480-003	0.010	0.006	1	NA	02/10/09 15:35	ND	
Method Blank	P0900480-MB	0.010	0.006	1	NA	02/10/09 15:35	ND	

Approved By Sue Anderson Date : 2/19/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900480
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/10/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: _____ Date: 2/19/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900480
Date Analyzed: 02/10/09

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
ICV	0.0418	0.0430	103
CCV1	0.0418	0.0441	106

Approved By: _____ Date: 2/19/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900480
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/10/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900480-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	0.0390	98	92-113	

Approved By Sue Anderson Date : 2/19/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900480
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/10/09
Project Number :	G486090	**Date Received :**	02/10/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/10/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-16		Units :	mg/L (ppm)
Lab Code :	P0900480-002MS	P0900480-002DMS	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	0.0532	0.0532	106	106	82-114	<1	

Approved By _____ Date : 2/19/09

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 19, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 11, 2009. For your reference, these analyses have been assigned our service request number P0900492.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Client: Battelle CAS Project No: P0900492
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900492

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900492-001	MW-13	2/11/09	09:01
P0900492-002	MW-8	2/11/09	11:09

3

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P09004912

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 1Q09 Project Number G4866090
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												Remarks
												Cr III (7196)												
MW-13	(1)	2/11/09	0901	W	1							X												
MW-8	(2)		1109	1	2							X												MS/MSD

Preservative Key

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

Report Tier Levels - please select

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

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

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	2/11/09	1209		2/11/09	12:00
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	2/11/09	12:45		2/11/09	1245
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature ____ °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900492

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900492-001.01					
	7196A				
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	
P0900492-002.01					
	7196A				
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	
P0900492-002.02					
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900492

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 02/11/09 Date opened: 02/11/09 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0900492-001.01	125mL Plastic NP					
P0900492-002.01	125mL Plastic NP					
P0900492-002.02	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)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900492
Date Collected : 02/11/09
Date Received : 02/11/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-13	P0900492-001	0.010	0.006	1	NA	02/11/09 14:25	ND	
MW-8	P0900492-002	0.010	0.006	1	NA	02/11/09 14:25	ND	
Method Blank	P0900492-MB	0.010	0.006	1	NA	02/11/09 14:25	ND	

Approved By _____ Date : 2/19/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900492
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/11/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: Sue Anderson Date: 2/19/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900492
Date Analyzed: 02/11/09

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
ICV	0.0418	0.0441	106
CCV1	0.0418	0.0441	106

Approved By: _____ Date: 2/19/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900492
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/11/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900492-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	0.0410	103	92-113	

Approved By _____ Date : 2/19/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

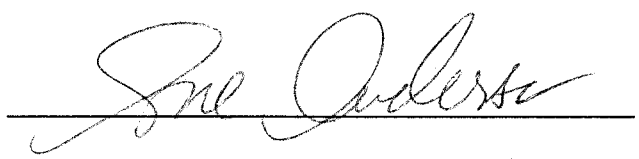
QA/QC Report

Client :	Battelle	**Service Request :**	P0900492
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/11/09
Project Number :	G486090	**Date Received :**	02/11/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/11/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-8		Units :	mg/L (ppm)
Lab Code :	P0900492-002MS	P0900492-002DMS	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	0.0533	0.0533	107	107	82-114	<1	

Approved By  Date : 2/19/09

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0900507

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 16, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 12, 2009. For your reference, these analyses have been assigned our service request number P0900507.

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900507
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900507-001	MW-10	2/12/09	08:13
P0900507-002	MW-15	2/12/09	11:39
P0900507-003	DUPE-07-1Q09	2/12/09	00:00
P0900507-004	MW-6	2/12/09	10:15

Acronyms

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

Qualifiers

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

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

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0900507

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 1Q09
Project Manager DAVID CONNER	**Project Number** 64860900
Phone 619-726-7311	**Fax**
Email Address for Result Reporting	**Sampler (Print & Sign)**
	P.O. # / Billing Information 214319/ BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201

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-10	1	3/12/09	0813	W	1						X	QC LEVEL IV
MW-15	2	"	1139	"	2						X	MS/MSD
DUPE-07-1009	3	"	—	"	1						X	DUPLICATE/QC LEVEL IV
MW-6	4	"	1015	"	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) X

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

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 3/12/09	Time: 1300	Received by: (Signature)	Date: 3/12/09	Time: 1500
Relinquished by: (Signature)	Date: 3/12/09	Time: 1340	Received by: (Signature)	Date: 3/13/09	Time: 0745
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 Groundwater Monitoring 1Q09/G486090

Service Request: P0900507

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900507-001.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1357	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-002.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1357	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-002.02					
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-003.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-004.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900507

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 02/12/09 Date opened: 02/12/09 by: LKUKITA

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
P0900507-001.01	125mL Plastic NP					
P0900507-002.01	125mL Plastic NP					
P0900507-002.02	125mL Plastic NP					
P0900507-003.01	125mL Plastic NP					
P0900507-004.01	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)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900507
Date Collected : 02/12/09
Date Received : 02/12/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-10	P0900507-001	0.010	0.006	1	NA	02/12/09 15:05	ND	
MW-15	P0900507-002	0.010	0.006	1	NA	02/12/09 15:05	ND	
DUPE-07-1Q09	P0900507-003	0.010	0.006	1	NA	02/12/09 15:05	ND	
MW-6	P0900507-004	0.010	0.006	1	NA	02/12/09 15:05	ND	
Method Blank	P0900507-MB	0.010	0.006	1	NA	02/12/09 15:05	ND	

Approved By _____ Date : 2/16/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900507
Date Analyzed: 02/12/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: _____ Date: 2/16/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900507
Date Analyzed: 02/12/09

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
ICV	0.0418	0.0420	100
CCV1	0.0418	0.0420	100

Approved By: _____ Date: 2/16/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900507
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/12/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900507-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	0.0390	98	92-113	

Approved By _____ Date : 2/16/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900507
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/12/09
Project Number :	G486090	**Date Received :**	02/12/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/12/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-15		Units :	mg/L (ppm)
Lab Code :	P0900507-002MS	P0900507-002DMS	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	0.0531	0.0531	106	106	82-114	<1	

Approved By _____ Date : 2/16/09

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0900527

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

February 16, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the sample submitted to our laboratory on February 13, 2009. For your reference, this analysis has been assigned our service request number P0900527.

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0900527
Project: JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The sample was received intact under chain of custody on February 13, 2009 and was 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 sample at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900527

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900527-001	MW-5	2/13/09	08:16

Columbia Analytical Services, Inc.

Acronyms

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

Qualifiers

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

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

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. R0900527

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE., C-205 SAN DIEGO, CA 92110	JPL GW MON 1Q09 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											Remarks
MW-5	1	2/13/09	0816	W	2							X											MS/MSD/QC LEVEL IV
~~MW-6~~ (CB)					~~2~~ 1							~~X~~ (EDD)											

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) X

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

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	2/13/09	1102		2/13/09	1102
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	2/13/09	1750		2/13/09	1750
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 Groundwater Monitoring 1Q09/G486090

Service Request: P0900527

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900527-001.01					
	7196A				
		2/13/09	1149	SMO / LKUKITA	
		2/13/09	1208	In Lab / SANDERSON	
		2/13/09	1308	P-37 / SANDERSON	
P0900527-001.02					
		2/13/09	1149	SMO / LKUKITA	
		2/13/09	1208	In Lab / SANDERSON	
		2/13/09	1308	P-37 / SANDERSON	

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Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0900527

Project: JPL Groundwater Monitoring 1Q09 / G486090

Sample(s) received on: 2/13/09 Date opened: 2/13/09 by: LKUKITA

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
P0900527-001.01	125mL Plastic NP					
P0900527-001.02	125mL Plastic NP					

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

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

2/13/09 11:54 AM

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 1Q09
Project Number : G486090
Sample Matrix : WATER

Service Request : P0900527
Date Collected : 02/13/09
Date Received : 02/13/09

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-5	P0900527-001	0.010	0.006	1	NA	02/16/09 12:45	ND	
Method Blank	P0900527-MB	0.010	0.006	1	NA	02/16/09 12:45	ND	

Approved By Sue Anderson Date : 2/16/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0900527
Project:	JPL Groundwater Monitoring 1Q09 / G486090	**Date Analyzed:**	02/13/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: _____ Date: 2/16/09

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900527
Date Analyzed: 02/13/09

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
ICV	0.0418	0.0408	98
CCV1	0.0418	0.0408	98

Approved By: _____ Date: 2/16/09

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900527
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/16/09

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0900527-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	0.0387	97	92-113	

Approved By _____ Date : 2/16/09

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0900527
Project Name :	JPL Groundwater Monitoring 1Q09	**Date Collected :**	02/13/09
Project Number :	G486090	**Date Received :**	02/13/09
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	02/16/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-5		Units :	mg/L (ppm)
Lab Code :	P0900527-001MS	P0900527-001DMS	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	0.0478	0.0478	96	96	82-114	<1	

Approved By _____ Date : 2/16/09

Report By:NFallahi