### Page \_\_\_ of \_\_\_

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

2655 Park Center Drive, Suite A

Simi Valley, California 93065 Phone (805) 526-7161 Fax (805) 526-7270

Zn Acetate Asc Acid BLAWK H2S04 Preservative Key NaOH HNO3 Other Remarks なりづん CAS Project No.  $OC(L_{\lambda})$ က 4 9 9 CAS Contact 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 Analysis Method and/or Analytes Preservative Code S270C □ (Subcontracted) SM\DD sains Organics GC\MS TPH FC □ 8015M (Subcontracted) TPH Diesel 8015B ⊡ (Subcontracted) TPH Diesel Low Level 8015B □ (Subcontracted) TPH Gas 8015B ☐ MTBE 8021B ☐ BTEX 8021B ☐ Volatile Organics GC/MS □ 8260B □ Oxygenates □ TPH Gas □ ATTN GERALD TOMPHINE Number of Containers JPL GW MON. 3409 BATTELLE COLUMBUS, OH 4320 505 KING ANG G 4g 6っ分o Matrix 3 Project Number Project Name 2143191 Sampler (Print & Sign) Date Time Collected Collected 758 418 718 737 7131/09 3990 OLD TOWN AVE., C-WS Company Name & Address (Reporting Information) Laboratory ID Number B 0 ころびかのみ Email Address for Result Reporting SAN DIES, CA EB-9-71/169 Columbia Analytical Services no. (A) 726-731 MW-22-An Employee - Owned Company BATIELLE Project Manager DAUD Client Sample ID Ž Ž Z V

Project Requirements (MRLs, QAPP)

Cooler / Blank / Ice / No Ice

Timilet 🔝

EDD required Yes / No Type:

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

Tier III - (Data Validation Package) 10% Surcharge . Tier V - (client specified) \_\_\_\_\_

Tier 1 - (Results/Default if not specified)

Fier II - (Results + QC)

Relinquished by: (Signature)

Relinquisheds (Signature) Relinquished by: (Signature)

Report Tier Levels - please select

Received by: (Signature) Received by: (Signature)

Received by: (Signature)

Time: Oo Time: 🎤 🦫

Time:

Temperature  $3^{\mathcal{C}}$ 

### Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902614

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902614-001.01					
	7196A				
		7/31/09	1113	SMO / MZAMORA	
		7/31/09	1113	P-37 / MZAMORA	
		7/31/09	1155	In Lab / SANDERSON	
		7/31/09	1514	P-37 / SANDERSON	
P0902614-002.01					
	7196A				
		7/31/09	1113	SMO / MZAMORA	
		7/31/09	1113	P-37 / MZAMORA	
		7/31/09	1155	In Lab / SANDERSON	
		7/31/09	1514	P-37 / SANDERSON	
P0902614-003.01					
	7196A				
		7/31/09	1113	SMO / MZAMORA	
		7/31/09	1113	P-37 / MZAMORA	
		7/31/09	1155	In Lab / SANDERSON	
		7/31/09	1514	P-37 / SANDERSON	
P0902614-004.01					
	7196A				
		7/31/09	1113	SMO / MZAMORA	
		7/31/09	1113	P-37 / MZAMORA	
		7/31/09	1155	In Lab / SANDERSON	
		7/31/09	1514	P-37 / SANDERSON	

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	е Ассертапсе	CHECK FOI II	Work order:	P0902614			
Project:	JPL GW Mon	3Q09 / G486090								
	s) received on:				Date opened:	· · · · · · · · · · · · · · · · · · ·	<b>-</b> .	MZAN		
		l samples received by CAS		-	•				indication	nof
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either at	t the request of t	he client and/or as rec	quired by the meth	od/SOP. <u><b>Yes</b></u>	No	N/A
1	Were sample	containers properly n	narked with cl	ient sample ID	?			$\boxtimes$		
2	-	supplied by CAS?		•				$\times$		
3	Did sample co	ontainers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-e	of-custody provided?						$\times$		
5	Was the <b>chair</b>	<b>1-of-custody</b> properly	completed?					$\boxtimes$		
6	Did sample co	ontainer labels and/or	tags agree wi	th custody par	ers?			$\times$		
7	Was sample v	olume received adequ	ate for analys	is?				$\times$		
8	Are samples w	vithin specified holdin	g times?					$\times$		
9	Was proper te	mperature (thermal p	oreservation) o	f cooler at rec	eipt adhered	to?		$\times$		
	C	ooler Temperature		°C Blank	Temperature	3	_°C			
10	Was a trip bla	ank received?								X
	Trip blank s	upplied by CAS:					<b>~</b>			
11	Were custody	seals on outside of co	ooler/Box?						$\times$	
	Location of	seal(s)?	·				Sealing Lid?			$\times$
	Were signat	ure and date included?	)							X
	Were seals i									$\times$
		seals on outside of sar	mple container	?					$\overline{\times}$	
	Location of	* *				<u> </u>	Sealing Lid?			$\boxtimes$
		ure and date included?	)							$\boxtimes$
	Were seals i			., .						$\boxtimes$
12		have appropriate pre	•	_		lient specified in	formation?	$\boxtimes$		
		nt indication that the s	-		reserved?					$\overline{\times}$
	•	ials checked for prese								$\overline{\times}$
		nt/method/SOP require	-		ample pH and	d if necessary alt	ter it?			$\boxtimes$
13	Tubes:	Are the tubes cap	-	?						$\boxtimes$
		Do they contain n								$\boxtimes$
14	Badges:	Are the badges p								$\times$
		Are dual bed badg	ges separated a	nd individuall	y capped and	l intact?				$\boxtimes$
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	
		Description	pH *	pН	pH	(Presence/Absence)	(	'ommer	its	
P0902614		125mL Plastic NP								
P0902614		125mL Plastic NP								
P0902614 P0902614		125mL Plastic NP 125mL Plastic NP								
. 0702011									<del></del>	
Explain a	ny discrepancies	: (include lab sample ID	numbers):		-					

<sup>\*</sup>Required pH: Phenois/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: G486090

WATER

Sample Matrix:

Service Request: P0902614 **Date Collected:** 07/31/09

Date Received: 07/31/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-22-3	P0902614-001	0.010	0.003	1	NA	07/31/09 14:50	ND	
MW-22-2	P0902614-002	0.010	0.003	1	NA	07/31/09 14:50	ND	
MW-22-1	P0902614-003	0.010	0.003	1	NA	07/31/09 14:50	ND	
EB-9-7/31/09	P0902614-004	0.010	0.003	1	NA	07/31/09 14:50	ND	
Method Blank	P0902614-MB	0.010	0.003	1	NA	07/31/09 14:50	ND	

Karu Rya

Date:

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902614

Date Analyzed: 07/31/09

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	0.003	ND
CCB1	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Kau Rya

Date: 4/31/09

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902614

Date Analyzed: 07/31/09

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	Acceptance Criteria
ICV	0.0579	0.0546	94	90-110
CCVI	0.0579	0.0546	94	90-110

Approved By:

CCV1A/120594

\_\_\_\_

Date: 7/31/09

Karu Rya

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number : Sample Matrix : G486090 WATER Service Request: P0902614

Date Collected: NA

Date Received: NA
Date Extracted: NA

Date Analyzed: 07/31/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name :

Laboratory Control Sample

Lab Code: P09

P0902614-LCS

Units: mg/L (ppm)

Basis: NA

Test Notes:

CAS Percent Recovery Acceptance Analysis Percent Result Prep Limits Method Method True Value Result Recovery Notes Analyte Chromium, Hexavalent None 7196A 0.0400 0.040 100 86-114

Karen Ryan

Date:

7/31/09

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902614

**Date Collected:** 07/31/09 **Date Received:** 07/31/09

Date Extracted: NA

**Date Analyzed:** 07/31/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: Lab Code:

MW-22-3

P0902614-001MS

P0902614-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0514	0.0514	103	103	80-120	<1	

Karen Ryan

Date:



### CAS SR #P0902633

### **Table of Contents**

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### LABORATORY REPORT

August 4, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 3, 2009. For your reference, these analyses have been assigned our service request number P0902633.

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.

aleste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager



2655 Park Center Drive, Strite &

I Simi Valley, CA 93065

805,526,7161

805 526 7270 fax

www.caslab.com

Client:

Battelle

CAS Project No:

P0902633

Project:

JPL GW Mon 3Q09 / G486090

### CASE NARRATIVE

The samples were received intact under chain of custody on August 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 GW Mon 3Q09/G486090

### SAMPLE CROSS-REFERENCE

Service Request: P0902633

<u>SAMPLE #</u>	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0902633-001	MW-12-3	8/3/09	08:48
P0902633-002	MW-12-2	8/3/09	09:25
P0902633-003	MW-12-1	8/3/09	09:58
P0902633-004	DUPE-7-3Q09	8/3/09	00:00
P0902633-005	EB-10-8/3/09	8/3/09	09:41

### 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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.

### Page of

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

	CASPraiect No 2635	CAS Contact:		eserva	0 None				4 NaOH	5 Zn Acetate	6 Asc Acid	7 Other				Remarks	Ns/450				DUPLICATE		France Granie					Project Requirements (MRLs, QAPP)	
•	) please circle (25%) 10 Day Standard)	Analysis Method and/or Analytes		Preservative Code																								EDD required Yes / No Type:	Salax Ko Tings
	around Time in Business Days (Surcharges) please circle Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day	Analysis Method		-	2	(pəq		(	pət qne	B (s	osi onti onti trac	8 38 (Subo (Subo (Subo (Subo (Subo	Oxy MTI B B -eve-	015B     8015   0w	8260 021 9361 9361 021 021	724 □ 124 0id 1724 0id 1724 □ 1724 □ 1724 □	- - - - - -		×	\ <u>\</u>	X		Y					MRL required Yes / No MDL / PQL / J required Yes / No	A H J Complete
	Requested Turnaround Tim 1 Day (100%) 2 Day (75%)			1	MON 50009	er	00000000	27-0		メインシー/ SATIBLE	CAPTURE CAPTURE	150 H	1	Sojura	910	Matrix Containers	7											.kage) 10% Surcharge	Times C4   Received by (Signarge)
2655 Park Center Drive, Suite A Simi Valley. California 93065		T	ation) Project Name	,	4	Project Number	_		F.O. # / Billing information	314514	2 × ×	500 CAS	Sampler (Print & Sign)			Date Time Collected Collected	813/04 848	1	\Z\_	958	[		176					Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	194, 1,0 Tipis 54
			Company Name & Address (Reporting Information)		TOWN AVE, CODS	S 92110				CONNER.	Fax	-	sult Reporting			Laboratory ID Number			7	1 3	3009 4	, ,	5 50/1/						
Columbia Analytical	An Employee - Owned Company		Company Name & Ad	ひるとクコカ	3990 000	CA13 316/2	らいるとよう	D. C.	rioject iviariager	VAV.0	Phone	(619) TL - 731	Email Address for Result Reporting			Client Sample ID	MW-12-3		NW-16-	MW-12-	DUPE-7-3		F13-0-81					Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + QC)	Relinquished by: (Signature)

Cooler /Blank / Ice / No Ice

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902633

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed O
P0902633-001.01					
	7196A	0 (2 (0 0		GNAC / GGT A DY DG	
		8/3/09	1144	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09 8/4/09	1154 1308	In Lab / SANDERSON P-37 / SANDERSON	N. i
		0/4/09	1508	1-377 SANDERSON	*
20902633-001.02		0 (2 (0 0		0) (0 / 00T + DY TO	
		8/3/09	1145	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1154	In Lab / SANDERSON	
		8/4/09	1308	P-37 / SANDERSON	¥-
20902633-002.01					
	7196A	0/0/00	1144	OMO / COT A DY DO	
		8/3/09	1144	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1154	In Lab / SANDERSON	
		8/4/09	1308	P-37 / SANDERSON	A <sup>*</sup>
20902633-003.01					
	7196A				
		8/3/09	1144	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1154	In Lab / SANDERSON	
		8/4/09	1308	P-37 / SANDERSON	Х.
20902633-004.01					
	7196A	0/2/00	1111	C) 40 / CCT A DV EC	
		8/3/09	1144	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1154	In Lab / SANDERSON	
		8/4/09	1308	P-37 / SANDERSON	<u> </u>
20902633-005.01					
	7196A				
		8/3/09	1144	SMO / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1145	P-37 / SSTAPLES	
		8/3/09	1154	In Lab / SANDERSON	
		8/4/09	1308	P-37 / SANDERSON	X-

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle		•	<b>F</b>		Work order:	P0902633			
_		3Q09 / G486090								
	s) received on:				Date opened:		_ by:	SSTAF		
		samples received by CAS							indication	n of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either a	the request of the	he client and/or as re	quired by the meth	Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly r	narked with cli	ient sample ID	)?			$\boxtimes$		
2	-	upplied by CAS?			•			$\overline{\mathbb{X}}$		
		ontainers arrive in go	od condition?					$\overline{\times}$		
	-	of-custody provided?						$\boxtimes$		
		-of-custody properly	completed?					$\boxtimes$		
		ontainer labels and/or	-	th custody par	ers?			$\overline{\mathbf{x}}$		
	_	olume received adequ						$\overline{\times}$		
	-	rithin specified holding	•					$\overline{\boxtimes}$		
9	-	mperature (thermal)	-	f cooler at rec	eint adhered t	to?		$\boxtimes$		
		ooler Temperature			Temperature	4	°C		_	_
10	Was a trip bla	•	<del></del>	C Diank	emperatare		- ~			$\boxtimes$
10	_	applied by CAS:						_		
11	•	seals on outside of co	ooler/Box?				_		$\boxtimes$	
11	Location of		JOICI/DOX:				Sealing Lid?			$\boxtimes$
		re and date included					_ Scaling Liu:			$\boxtimes$
	Were seals in		<b>'</b>							$\boxtimes$
			mmla aantainam	.9					$\boxtimes$	
		seals on outside of sa	mpre container				Caulina I ido			$\boxtimes$
	Location of	` '					_Sealing Lid?			
	-	are and date included	<i>:</i>							$\boxtimes$
	Were seals in		4.	1' / /1	1/900	n:	c .: 0			$\boxtimes$
12		have appropriate pre				ment specified in	iformation?	$\boxtimes$		
		nt indication that the s	_		reserved?					$\boxtimes$
	Were <b>VOA</b> vi	ials checked for prese	ence/absence of	f air bubbles?						$\overline{\times}$
	Does the clien	nt/method/SOP requir	•		ample pH and	l if necessary al	ter it?			$\overline{\times}$
13	Tubes:	Are the tubes cap	ped and intact	?						$\times$
		Do they contain n	noisture?							$\times$
14	Badges:	Are the badges p	roperly capped	l and intact?						X
		Are dual bed badg	ges separated a	nd individuall	y capped and	intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	t / Pres	ervation	ı
	•	Description	pH*	pН	pН	(Presence/Absence)		Commer		
P0902633	-001.01	125mL Plastic NP								
P0902633	W	125mL Plastic NP								
P0902633		125mL Plastic NP								
P0902633		125mL Plastic NP								
P0902633		125mL Plastic NP							,	
P0902633		125mL Plastic NP								
Explain a	ny discrepancies	: (include lab sample ID	numbers):							

<sup>\*</sup>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);

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

**Project Number:** G486090 **Sample Matrix:** WATER

Analysis Method: 7196A

Service Request: P0902633

**Date Collected**: 08/03/09 **Date Received**: 08/03/09

Chromium, Hexavalent

Prep Method: None Units: mg/L (ppm)

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-3	P0902633-001	0.010	0.003	1	NA	08/03/09 16:55	ND	
MW-12-2	P0902633-002	0.010	0.003	1	NA	08/03/09 16:55	ND	
MW-12-1	P0902633-003	0.010	0.003	1	NA	08/03/09 16:55	ND	
DUPE-7-3Q09	P0902633-004	0.010	0.003	1	NA	08/03/09 16:55	ND	
EB-10-8/3/09	P0902633-005	0.010	0.003	1	NA	08/03/09 16:55	ND	
Method Blank	P0902633-MB	0.010	0.003	1	NA	08/03/09 16:55	ND	

Report By:SAnderson

QA/QC Report

Client: Project: Battelle

JPL GW Mon 3Q09 / G486090

Service Request: P0902633

Date Analyzed: 08/03/09

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	0.003	ND
CCB1	0.010	0.003	ND

Karu Rya Approved By:

\_\_ Date: \_\_\_\_\_ 8/4/09

ICCBMDL/120594

### QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902633

Date Analyzed: 08/03/09

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	Acceptance Criteria
ICV	0.0579	0.0560	97	90-110
CCVI	0.0579	0.0571	99	90-110

Karle Rya Date: 8/4/09 Approved By: CCV1A/120594

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

**Project Number:** Sample Matrix:

G486090 WATER

Service Request: P0902633

**Date Collected:** Date Received:

NA NA

Date Extracted: Date Analyzed: NA 08/03/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P0902633-LCS

Units:

mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis			Percent	CAS Percent Recovery Acceptance	Result
Analyte	Method	Method	True Value	Result			Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0413	103	86-114	

Karu Ryan Date: Approved By

QA/QC Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

**Project Number:** G486090 **Sample Matrix:** WATER

Service Request: P0902633

Date Collected: 08/03/09

Date Received: 08/03/09

Date Extracted: NA

**Date Analyzed:** 08/03/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-12-3

Lab Code: P09

P0902633-001MS

P0902633-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0508	0.0529	102	106	80-120	4	

Approved By KMU Ryu Date: 8/4/09 13



### **Table of Contents**

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nternal Chain of Custody	7-8
Sample Acceptance Check Form	9-10
Hexavalent Chromium Analytical Data	11-16
Hexavalent Chromium Raw Data	17-26



August 6, 2009

Columbia

Analvtical Services

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

**RE: JPL GW Mon 3Q09 / G486090** 

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 4, 2009. For your reference, these analyses have been assigned our service request number P0902658.

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 <u>26</u> 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. he Judesti

Sue Anderson

Project Manager



Client:

Columbia

Analytical Services<sup>™</sup>

Battelle

CAS Project No:

P0902658

Project:

JPL GW Mon 3Q09 / G486090

### CASE NARRATIVE

The samples were received intact under chain of custody on August 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 Service Request: P0902658

Project: JPL GW Mon 3Q09/G486090

### SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902658-001	MW-25-5	8/4/09	07:57
P0902658-002	MW-25-4	8/4/09	08:23
P0902658-003	MW-25-3	8/4/09	08:59
P0902658-004	MW-25-2	8/4/09	09:25
P0902658-005	MW-25-1	8/4/09	09:50
P0902658-006	EB-11-8/4/09	8/4/09	09:37
P0902658-007	MW-26-2	8/4/09	11:16
P0902658-008	MW-26-1	8/4/09	11:35

### 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

MModified MethodMDLMethod Detection LimitMRLMethod 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.

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

Columbia 2655 Park Center D
Analytical Simi Valley, Californ

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

An Employee - Owned Company Phone (805) 526-7161  Fax (805) 526-7270	5-7161 270	Requested Turn   1 Day (100%) 2	urnaround Tim )2 Day (75%)	<b>ne in Busines</b> ) 3 Day (50%)	ss Days (Surch )4 Day (35%)	(Surcharge: 35%) 5 Day	around Time in Business Days (Surcharges) please circle Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard		CAS Pro	CAS Project No.	
Company Name & Address (Reporting Information)		Project Name			Ar	alysis Meth	Analysis Method and/or Analytes		CAS Contact:	ntact:	<u></u>
BATTELLE			i				Preservative Code			Preservative Key	Τ
3990 OLD TOWN AVE. 6-205	1	GW MW.	4, 300G			0				0 None	
SAN DIEGO, CA GAITO		Project Number			(					HCL H	
	C	6486080				(					4,0
Project Manager	P.O. #	P.O. # / Billing Information	LK	(pə:		7					
PAVID CONNER	ころ	319 / BAT	Terré	3 🗆 tract	əcte	(per				5 Zn Acetate	ē
	VIX	All Called John Films	STAPKINS STAPKINS	⊇ sət 0S11 nooc	ntno	T				6 Asc Acid	
(1,9)726-7311	33	TO SOME OF	7.52.2.1	Ngena Ngena	odue	прсок				7 Other	
ddress for Result Reporting	Sampler (Print & Sign)			015B□ Ox 18□ MT 18015B□	) M3108						
Client Sample ID Number C	Date Time Collected	ed Matrix	Number of Containers	Volatile Org 624 □ 826 TPH Gas 8 BTEX 8021 TPH Diesel	TPH FC □					Remarks	Γ
	156 90/4/8	3	-			×					Т
15-4	•	-	_			×					
-3	658	6	d			×				MS/MSD	
MW-25-2	925	\	1			×					Γ
MW-25-1	95:	_				X					П
6/2	9,7					>					
50/6/8 -//-	137		-			$\downarrow$				MODE BLANC	<u> </u>
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eport Tier Levels - please select er I - (Results/Default if not specified) Tier	er III - (Data Valida	Tier III - (Data Validation Package) 10% Surchargé	Surchargé	MRL req	ujyed Yes/	No	EDD required Yes	/ No	Project R	Project Requirements (MRLs, QAPP)	
	Tier V - (client specified)	(pe		MDL/P	ALY Likely	MDL / POL Linequired Yes / No	Type:				

Cooler / Blank / Ice / No Ice

Tinge , 3/

Date:

Relinquished by: (Signature).

Relinquished by: (Signat

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

Page of

2655 Park Center Drive, Suite A Phone (805) 526-7161

Columbia Analytical

Simi Valley, California 93065 Fax (805) 526-7270

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 NaOH HN03 Other 되 Remarks Cooler# Blank / Ice / No Ice ო S CAS Project No. CAS Contact: Safection Time 2: 3 Time: EDD required Yes / No Type: 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 Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL/ (required Yes / No O Semi-Volatile Organics GC/MS 625 □ 8270C □ (Subcontracted) LPH FC □ 8015M (Subcontracted) TPH Diesel 8015B □ (Subcontracted) Received by: (Signature Received by: (Signature Volatile Organics GC/MS 624 □ 82608 □ Oxygena Oxygenates 🗆 TPH Gas 🗆 JPL GW MWN 3409 Project Number 214319 /BATTELLE ATINIGERALD TOMPLENS 505 KING AVE Number of Containers Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) OH 4350 P.O. # / Billing Information 723 Y G486090 Matrix Time: ime. wekmasus Project Name Sampler (Print & Sign) 8/1-1/28 Date Time Collected Collected 91 Date: 12/4/8 3990 OLD TOWN AVE, C205 Company Name & Address (Reporting Information) Laboratory ID Number SAN DIEGO, CA 92110 CONNER Email Address for Result Reporting Fier I - (Results/Default if not specified) Report Tier Levels - please select 1126-73H NW-26-1 Employee - Owned Company MW-26-2 Relinquished by: (Signature) BATTELLE Relinquished (Signature) Relinquished by: (Signature) Fier II - (Results + QC) Project Manager Client Sample ID DAVID

Temperature

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902658

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed Or
P0902658-001.01					
	7196A	0.14.10.0	1000		
		8/4/09	1332	SMO / ADAVID	
		8/4/09 8/4/09	1333 1446	P-37 / ADAVID In Lab / SANDERSON	
		8/4/09 8/4/09	1711	P-37 / SANDERSON	
		0/ 1/ 0/	1711	1 377 STREET	
P0902658-002.01	71074				
	7196A	8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1446	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
20902658-003.01			<u> </u>		
10.50702020-003.01	7196A				
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1446	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
P0902658-003.02					
		8/4/09	1333	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1446	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
P0902658-004.01					
	7196A				
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1447	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
P0902658-005.01					
	7196A				
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1447	In Lab / SANDERSON	
v.v.41-244-0		8/4/09	1711	P-37 / SANDERSON	
P0902658-006.01					
	7196A				
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1447	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
P0902658-007.01					
	71064				

7196A

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902658

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1447	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	
P0902658-008.01					
	7196A				
		8/4/09	1332	SMO / ADAVID	
		8/4/09	1333	P-37 / ADAVID	
		8/4/09	1447	In Lab / SANDERSON	
		8/4/09	1711	P-37 / SANDERSON	

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampl	e Acceptance		Work order:	P0902658			
		3Q09 / G486090								
	s) received on:			]	Date opened:	08/04/09	by:	ADAV	ID	
		samples received by CAS.	The use of this f	form for custody s	eals is strictly m	eant to indicate pres	ence/absence and r	ot as an i	ndication	ı of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either at	the request of th	e client and/or as re	quired by the meth	od/SOP.		<b>B</b> 17.4
								Yes	No	N/A
1	-	containers properly n	narked with cli	ient sample ID	?			$\boxtimes$		
2		supplied by CAS?						$\boxtimes$		
3	Did sample co	ontainers arrive in goo	od condition?					$\boxtimes$		
4	Was a chain-	of-custody provided?						$\times$		
5	Was the chair	<b>1-of-custody</b> properly	completed?					$\boxtimes$		
6	Did sample co	ontainer labels and/or	tags agree wi	th custody pap	ers?			$\boxtimes$		
7	Was sample v	olume received adequ	ate for analys	is?				$\times$		
8	Are samples v	vithin specified holdin	g times?					$\times$		
9	Was proper te	mperature (thermal p	reservation) o	f cooler at rec	eipt adhered t	0?		$\times$		- I
	C	ooler Temperature		°C Blank 7	emperature	2	_°C			
10	Was a trip bla	ınk received?								$\times$
	Trip blank s	upplied by CAS:					- <b>-</b>			
11	Were custody	seals on outside of co	oler/Box?						X	
	Location of	seal(s)?					_Sealing Lid?			[X]
	Were signat	ure and date included?	•				_			$\times$
	Were seals i	ntact?								$\times$
	Were custody	seals on outside of sar	mple container	r?					X	
	Location of		•				Sealing Lid?			$\times$
		ure and date included?	·				_			$\boxtimes$
	Were seals i									$\times$
12		have appropriate pre	servation, acc	ording to metl	nod/SOP or C	lient specified ir	formation?	$\times$		
12		nt indication that the s				•				X
		ials checked for prese								$\boxtimes$
		nt/method/SOP require			amnle nH and	l if necessary al	ter it?			$\boxtimes$
12	Tubes:	Are the tubes cap			ашрте ртт апс	i ii necessary ai	ter it:			$\boxtimes$
13	Tunes.			•						$\boxtimes$
		Do they contain n		1 1'0						$\boxtimes$
14	Badges:	Are the badges p			1 1	0				
		Are dual bed badg	ges separated a	ind individuall	y capped and	intact?				$\boxtimes$
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace			ervation	1
		Description	pH *	pН	pН	(Presence/Absence)	(	Commei	its	
P0902658	3-001.01	125mL Plastic NP								
P0902658		125mL Plastic NP								
P0902658		125mL Plastic NP								
P0902658 P0902658		125mL Plastic NP 125mL Plastic NP								
P0902658		125mL Plastic NP								
***************************************		:: (include lab sample ID	numbers):							
4		,								

<sup>\*</sup>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);

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	 	Work order:	P0902658		
Project: JPL GW Mon 3Q09 / G486090					
Sample(s) received on: 08/04/09	 Date opened:	08/04/09	by:	ADAVID	

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	
	Description	р <b>Н</b> *	pН	pН	(Presence/Absence)	Comments
P0902658-006.01	125mL Plastic NP					
P0902658-007.01	125mL Plastic NP					
P0902658-008.01	125mL Plastic NP					
No. of the second secon						
						Miles Water
			**************************************		1	
			****			
**************************************						AP
				man vari		
***************************************						
		**********				
11004407						
			<b>V</b>			
					<u> </u>	
			l	l	<u> </u>	

Explain any discrepancies:	(include lab sample ID numbe	rs):		

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090

Sample Matrix:

WATER

Service Request: P0902658 Date Collected: 08/04/09

Date Received: 08/04/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-25-5	P0902658-001	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-25-4	P0902658-002	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-25-3	P0902658-003	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-25-2	P0902658-004	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-25-1	P0902658-005	0.010	0.003	1	NA	08/04/09 16:27	ND	
EB-11-8/4/09	P0902658-006	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-26-2	P0902658-007	0.010	0.003	1	NA	08/04/09 16:27	ND	
MW-26-1	P0902658-008	0.010	0.003	1	NA	08/04/09 16:27	ND	
Method Blank	P0902658-MB	0.010	0.003	1	NA	08/04/09 16:27	ND	

Kare Rya Date : 8/5/09

QA/QC Report

Client:

Battelle

**Project:** 

JPL GW Mon 3Q09 / G486090

Service Request: P0902658

Date Analyzed: 08/04/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:	Karee	Rya	Date:	8/5/09
CCBMDL/120594				,

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902658

Date Analyzed: 08/04/09

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	Acceptance Criteria
ICV	0.0579	0.0572	97	90-110
CCV1	0.0579	0.0572	99	90-110
CCV2	0.0579	0.0583	101	90-110

Approved By:	Karee	Rna	Date:	8/5/0
CCV1A/120594				/

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

**Project Number:** Sample Matrix:

WATER

G486090

Service Request: P0902658

Date Collected:

NA Date Received: NA

Date Extracted:

NA

08/04/09 Date Analyzed:

Laboratory Control Sample Summary **Inorganic Parameters** 

Sample Name:

Laboratory Control Sample

Lab Code:

P0902658-LCS

Units:

mg/L (ppm)

Basis: NA

Test Notes:

CAS Percent Recovery Acceptance Analysis Percent Result Prep Limits Method True Value Result Recovery Notes Method Analyte 7196A 0.0400 0.0416 104 86-114 None Chromium, Hexavalent

Karen Ryp Date:

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902658

**Date Collected:** 08/04/09 **Date Received:** 08/04/09

Date Extracted: NA

Date Analyzed: 08/04/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-25-3

Lab Code:

P0902658-003MS

P0902658-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result		Result DMS	Rec	oike overy 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	80-120	<1	

Karen Rya Date:



### CAS SR #P0902674

### **Table of Contents**

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ample Cross-Reference		
Acronym List	4	
Chain of Custody	5	
nternal Chain of Custody	6	
Sample Acceptance Check Form	7	
Hexavalent Chromium Analytical Data	8-13	3
Hexavalent Chromium Raw Data	14-2	23



### LABORATORY REPORT

August 6, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 5, 2009. For your reference, these analyses have been assigned our service request number P0902674.

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  $\mathcal{L}$  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.

ine anderta

Sue Anderson Project Manager

> Page I of <u></u>23



Simi Valley, CA 93066

805.526.7161

805.526.7270 fax

www.caslab.cor

Client:

Columbia

Analytical Services\*

Battelle

CAS Project No:

P0902674

Project:

JPL GW Mon 3Q09 / G486090

### **CASE NARRATIVE**

The samples were received intact under chain of custody on August 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 GW Mon 3Q09/G486090

Service Request: P0902674

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902674-001	MW-7	8/5/09	08:41
P0902674-002	MW-16	8/5/09	10:29

### 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 Billionppm 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.

# Page

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

Columbia Analytical	Water & 2655 Park Center Drive, Suite A	Wate ter Drive, S	Sr & Siuite A	Water & Soil - Chai	$\Box$	Custo	dy Re	cord	₹ ⊗	of Custody Record & Analytical Service	I Serv		Request	Page	T-1126/9	of /
Services No.	Simi Valley, California 93055 Phone (805) 526-7161 Fax (805) 526-7270	iirornia 930 26-7161 -7270	<del></del>	Requested 1 1 Day (100%	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	ime in Bus 6) 3 Day (8	<b>siness Da</b> 50%) 4 D	iys (Sur ay (35%	charges 5 Day	please circ (25%) 10 D	ile ay - Standard	p	CAST	CAS Project No. 2	26	74
Comnany Name & Addrass (Renorting Information)	s (Reporting Inform	nation)	Project Name	9				Analys	is Metho	Analysis Method and/or Analytes	nalytes		CAS (	CAS Contact:		
タイトのコル			2006	,					"	Preservative Code	ode				Preservative Key	ve Key
3990 063 73	TOWN AVE. GROS	1335	J8L GW	J Man 300	3009				0						0	None
$\mathcal{O}$	CA 9211	<sub>Q</sub>	Project Number	mber C.Q.C.			itracted)								- 6	HCL HNO3
Project Manager			P.O. # / Bill	P.O. # / Billing Information	nc	t Gas	pcou									H2S04
	CHNER		214319	/ BATIEL			nS) 🗆	(pə:	(9						*	NaOH Zn Acetate
ŗ	Fax		ATIN GERAL 505 ICING	ATN GENARY 131. 505 1CING AVE	SIM THIS	J sətsuət	8015B	CONTRACT	1511						9	Asc Acid Other
Email Address for Result Reporting	Reporting	Sampler (	Sampler (Print & Sign)	)) CA	1000	ganics GC/l 508 □ Oxyg 1015B □ MTB	8015B □ 6   Low Leve	oinsganic du2) □ O07	) 1/							
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	828 □ 428 3 889 H9T	eseid HqT	Semi-Volat	17						Remarks	rks
MW-7		26/5/8	128	3												
MW-16	7		129		2				メ					12/2	GSM/ST	
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riange and a second a second and a second an																
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Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results - OC)		Tier III - (Dai	ta Validation I	Tier III - (Data Validation Package) 10% Surch	Surcharge	MR	MRL required Yes / No	oN / sə,		EDD r	EDD required Yes / No	o.	Proje	Project Requirements (MRLs, QAPP)	nents (MRI	-s, QAPP)
	Ý	rer v - (chem specified)	l spacinady			N. C.	, / JINE / 1	nadinhaj	Testano	lype.	/	0				W. (2000)

Time: > 215 Cooler (Blank / Ice / No Ice

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902674

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902674-001.01					
	7196A				
		8/5/09	1246	SMO / ADAVID	
		8/5/09	1246	P-37 / ADAVID	
		8/5/09	1352	In Lab / SANDERSON	
		8/5/09	1707	P-37 / SANDERSON	
P0902674-002.01					
	7196A				
		8/5/09	1246	SMO / ADAVID	
		8/5/09	1246	P-37 / ADAVID	
		8/5/09	1352	In Lab / SANDERSON	
		8/5/09	1707	P-37 / SANDERSON	
P0902674-002.02					
		8/5/09	1246	SMO / ADAVID	
		8/5/09	1246	P-37 / ADAVID	
		8/5/09	1352	In Lab / SANDERSON	
		8/5/09	1707	P-37 / SANDERSON	

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle			e Acceptance	_	Work order:	P0902674			
		3Q09 / G486090								,
	s) received on:				Date opened:		······	ADAV		
		samples received by CAS.							indication	n of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either at	t the request of th	ne client and/or as re	quired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	<u>N/A</u> .
1	Were sample	containers properly n	narked with cli	ient sample ID	?			$\times$		
2	Container(s) s	upplied by CAS?						$\boxtimes$		
3	Did sample co	ontainers arrive in goo	od condition?					$\boxtimes$		
4	Was a chain-o	f-custody provided?						X		
5	Was the chain	-of-custody properly	completed?					$\times$		
6	Did sample co	ontainer labels and/or	tags agree wi	th custody pap	ers?			$\times$		
7	Was sample v	olume received adequ	ate for analys	is?				$\times$		
8	Are samples w	rithin specified holdin	g times?					$\times$		
9	Was proper te	mperature (thermal p	reservation) o	f cooler at rec	eipt adhered t	to?		X		
	Co	ooler Temperature		°C Blank	Γemperature	2	_°C			
10	Was a trip bla	nk received?								$\times$
	Trip blank su	upplied by CAS:								
11	Were <b>custody</b>	seals on outside of co	oler/Box?						$\overline{\times}$	
	Location of s	seal(s)?					_Sealing Lid?			$\boxtimes$
	•	re and date included?								$\boxtimes$
	Were seals in									$\boxtimes$
		seals on outside of sar	nple container	:?					$\boxtimes$	
	Location of s	•					Sealing Lid?			$\boxtimes$
	· ·	are and date included?								X
	Were seals in									$\boxtimes$
12		have appropriate pre				thent specified in	iformation?	$\boxtimes$		
		nt indication that the s			reserved?					$\boxtimes$
		ials checked for prese								$\boxtimes$
		nt/method/SOP require	•		ample pH and	l if necessary al	ter it?			X
13	Tubes:	Are the tubes cap	ped and intact	?						$\boxtimes$
		Do they contain n	noisture?							$\boxtimes$
14	Badges:	Are the badges p								$\times$
	411.4	Are dual bed badg	es separated a	nd individuall	y capped and	intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervatio	1
		Description	p <b>H</b> *	pН	pH	(Presence/Absence	) (	Comme	its	
P0902674		125mL Plastic NP								
P090267		125mL Plastic NP								
P0902674	+-UUZ.UZ	125mL Plastic NP								
				w						
Explain a	ny discrepancies	: (include lab sample ID	numbers):			=3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1				

<sup>\*</sup>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);

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902674

Date Collected: 08/05/09

Date Received: 08/05/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-7	P0902674-001	0.010	0.003	1	NA	08/05/09 16:40	0.008	J
MW-16	P0902674-002	0.010	0.003	1	NA	08/05/09 16:40	0.013	
Method Blank	P0902674-MB	0.010	0.003	1	NA	08/05/09 16:40	ND	

Estimated concentration. The result is less than the PQL but greater than the MDL.

Karu Rya

Date:

J

QA/QC Report

Client: Project: Battelle

JPL GW Mon 3Q09 / G486090

Service Request: P0902674

**Date Analyzed:** 08/05/09

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	0.003	ND
CCB1	0.010	0.003	ND

Approved By: \_

ICCBMDL/120594

Date: 8/6/09

Karu Rya

QA/QC Report

Client:

Battelle

Service Request: P0902674

Project:

JPL GW Mon 3Q09 / G486090

Date Analyzed: 08/05/09

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Kam Rya

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0564	97	90-110
CCV1	0.0579	0.0554	96	90-110

Approved By: \_

CCV1A/120594

\_\_\_\_\_Date: 8/10/09

11

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

**Project Number:** Sample Matrix:

G486090 WATER

**Service Request:** 

P0902674

Date Collected: Date Received:

NA NA

Date Extracted:

NA

Date Analyzed:

08/05/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0902674-LCS

Basis: NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0413	103	86-114	

Karen Rya Date: 8/10/09

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902674

Date Collected: 08/05/09 Date Received: 08/05/09

Date Extracted: NA

Date Analyzed: 08/05/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-16

Lab Code:

P0902674-002MS

P0902674-002DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	0.0129	0.0686	0.0645	111	103	80-120	6	

Karen Rya Date: 8/4/09 Approved By



### CAS SR #P0902698

### **Table of Contents**

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Sample Cross-Reference	3
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Chain of Custody	5
Internal Chain of Custody	6
Sample Acceptance Check Form	7
Hexavalent Chromium Analytical Data	8-13
Hexavalent Chromium Raw Data	14-23

### LABORATORY REPORT

August 6, 2009

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

Analvtical Services<sup></sup>

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 6, 2009. For your reference, these analyses have been assigned our service request number P0902698.

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 22 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



Simi Valley, CA 9306

805 526 7161

805 526 7270 fax

www.casiab.con

Client:

Battelle

Analytical Services

CAS Project No:

P0902698

Project:

JPL GW Mon 3Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902698

### SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	DATE	<u>TIME</u>
P0902698-001	MW-13	8/6/09	08:26
P0902698-002	MW-8	8/6/09	10:10
P0902698-003	MW-6	8/6/09	11:58

### 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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 of

Columbia
Analytical
Services
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

An Employee - Owned Company	Phone (805) 526-7161 Fax (805) 526-7270	6-7161		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	Turnaround ), 2 Day (75	Fime in Bu %) 3 Day (	<b>Isiness D</b> 50%) 4 E	ays (Sur ay (35%	charges) 5 Day (2	<b>please cir</b> 25%) 10 [	narges) please circle 5 Day (25%) 10 Day - Standard	dard		SAS Projec	CAS Project No.	755
Company Name & Address (Reporting Information)	Reporting Informa		Project Name	me				Analys	Analysis Method and/or Analytes	and/or A	nalytes			CAS Contact:	oct:	
SATELLE			. (						Pre	Preservative Code	Code				Preservative Key	ive Key
	JOHN AVE. C-WS	·	39LGW	IN LIMIN	√ 3009				0						0	None
1690	0/12h A		Project Number	mber			(beto								- 0	HCL HNO3
			248	0609845		□ se	ontra								ı m	H2S04
er			P.O. # / Bill	P.O. # / Billing Information	), i	ьн с	oqne		(						4	NaOH
40.0	CONNER		グズマングでスマング	128H	ELLC Shalk with		ntrac 3 🗆 (S	SI	75						2	Zn Acetate
7	Fax	•	505 X	3	בריאל בריאל	enates	enbcoi 8016E	GC/M	12						9 /	Asc Acid   Other
(619) 126 - 1311			COLUMBUS	4	व्म भ३%।	ухуде	S) 🗆	soin	<u>)</u>					•		
Email Address for Result Reporting		Sampler (i	Sampler (Print & Sign)	E		0 080	91 KO15B	tile Organ	7/					<b>I</b>		
Client Sample ID	Laboratory ID Number	$\vdash$	Time	Matrix	Number of Containers	Volatile VV S24 🗆 S2 TPH Gas PTEX 802	TPH Diese TPH Diese TPH FC	Semi-Vola 625 □ 82	1)						Remarks	ırks
MW-13	(2)	8/9/25	913	3	1				×							
MW-8	9		2101	~					   ×							
MW-6	0	_	1158	_					- - - - -							
	)															
					×					_						
Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + QC)		Tier III - (Data Validation Tier V - (client specified)	a Validation f	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	Surcharge	MF	MRL required Yes / No MDL / POL / J required	equired Yes / No POL / J required Yes / No	Yes / No	EDD Type:	EDD required Yes / No Type:	s / No		Project Req	Project Requirements (MRLs, QAPP)	Ls, QAPP)
Relinquished by: (Signature)	N		819669	-	Received by	(Sighatare)					) Jare (	Judy Time:	17			
Relinquish (Cignature)			Date:	Time:	Received by: (Signature)	(Signature)	に出	1	4		<b>3</b>	OK Time:3	333	Cooler / Bla	Cooler / Blank / Ice / No Ice	
ndilinguista by. (vigriacus)		-	- Care		וופספוגסק ביזי	(Signature)					- Cate	_		Temperature 💪	),	ပ္

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902698

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed O
P0902698-001.01					
	7196A				
		8/6/09	1400	SMO / MZAMORA	
		8/6/09	1400	P-37 / MZAMORA	
		8/6/09	1450	In Lab / SANDERSON	
		8/7/09	1053	P-37 / SANDERSON	Æ
20902698-002.01					
	7196A				
		8/6/09	1400	SMO / MZAMORA	
		8/6/09	1400	P-37 / MZAMORA	
		8/6/09	1450	In Lab / SANDERSON	
		8/7/09	1053	P-37 / SANDERSON	¥
20902698-003.01					<del></del>
	7196A				
		8/6/09	1400	SMO / MZAMORA	
		8/6/09	1400	P-37 / MZAMORA	
		8/6/09	1450	In Lab / SANDERSON	
		8/7/09	1053	P-37 / SANDERSON	X

\* sample put in 12-37 stolog (8 1745, NOT SININED)

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	е Ассертапсе	Check Fulli	Work order:	P0902698			
		3Q09 / G486090			_				**************************************	alaylik (Apriller, MAA) and alak apriller, 2007 (mg. 20)
-	s) received on:				Date opened:	08/06/09	by:	MZAN	10RA	
Note: This	form is used for al	l samples received by CAS	. The use of this	form for custody	seals is strictly n	neant to indicate prese	ence/absence and	not as an	indication	ıof
compliance	or nonconformity.	Thermal preservation and	pH will only be	evaluated either a	t the request of the	he client and/or as red	quired by the meth		No	NI / A
1	Wara sample	containers properly r	name ad writh al	iont gample IP	12			<u>Yes</u>	$\frac{No}{\Box}$	<u>N/A</u>
1 2	_	supplied by CAS?	narkeu wini ci	iem sampie il	<b>'</b> '			$\boxtimes$		
3		ontainers arrive in go	od condition?					$\boxtimes$		
4	•	of-custody provided?	ou conuntion.					$\boxtimes$		
5		<b>1-of-custody</b> properly	completed?					$\boxtimes$		
6		ontainer labels and/o	-	ith custody par	ners?			$\boxtimes$		
7	-	olume received adequ			. •			$\boxtimes$		
8	-	vithin specified holdin	•					X		
9	-	emperature (thermal)	-	of cooler at rec	eipt adhered	to?		$\times$		
	C	ooler Temperature		°C Blank	Temperature	2	°C			
10	Was a trip bla	ank received?		•			-			X
	Trip blank s	upplied by CAS:					_			
11	Were custody	seals on outside of co	ooler/Box?						$\times$	
	Location of	seal(s)?					Sealing Lid?			$\times$
	Were signat	ure and date included	?							$\times$
	Were seals i									$\times$
	Were custody	seals on outside of sa	mple containe	r?					$\times$	
	Location of	seal(s)?	•••		····		Sealing Lid?			$\times$
	Were signate	ure and date included	?							$\times$
	Were seals i									$\times$
12		have appropriate pre	•	•		Client specified in	formation?	$\times$		
	Is there a clie	nt indication that the s	submitted sam	ples are <b>pH</b> p	reserved?					$\times$
	Were <b>VOA v</b>	<u>ials</u> checked for prese	nce/absence o	f air bubbles?						$\times$
	Does the clien	nt/method/SOP requir	e that the analy	yst check the s	ample pH and	l if necessary alt	er it?			$\boxtimes$
13	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						$\times$
		Do they contain n	noisture?							$\boxtimes$
14	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bad	ges separated a	and individuall	y capped and	intact?				$\boxtimes$
Lab 5	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	it / Presi	ervation	ı
		Description	рН *	pН	рH	(Presence/Absence)		Commer	its	
P090 <b>26</b> 98	3-001.01	125mL Plastic NP								
P0902698		125mL Plastic NP								
P0902698	3-003.01	125mL Plastic NP							· · · · · · · · · · · · · · · · · · ·	
****										
Explain a	ny discrepancies	: (include lab sample ID	numbers):							

<sup>\*</sup>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); 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); 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); 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); 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); 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); Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS (phenols/TKN/T.PHOS (phen

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902698

Date Collected: 08/06/09

Date Received: 08/06/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-13	P0902698-001	0.010	0.003	1	NA	08/06/09 15:25	0.031	
MW-8	P0902698-002	0.010	0.003	1	NA	08/06/09 15:25	ND	
MW-6	P0902698-003	0.010	0.003	1	NA	08/06/09 15:25	ND	
Method Blank	P0902698-MB	0.010	0.003	1	NA	08/06/09 15:25	ND	

Kam Ryn Date:

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902698

Date Analyzed: 08/06/09

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	0.003	ND
CCB1	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Karu Rya Date: 8/H09

QA/QC Report

Client:

Battelle

**Project:** 

JPL GW Mon 3Q09 / G486090

Service Request: P0902698

**Date Analyzed:** 08/06/09

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	Acceptance Criteria
ICV	0.0579	0.0554	96	90-110
CCVI	0.0579	0.0544	94	90-110

Kar Ryan Approved By:

Date: 8/7/09

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

**Project Number:** Sample Matrix:

G486090 WATER

Service Request:

P0902698

08/06/09

Date Collected: Date Received:

NA NA

Date Extracted: Date Analyzed:

NA

Laboratory Control Sample Summary

**Inorganic Parameters** 

Sample Name: Lab Code:

Laboratory Control Sample

P0902698-LCS

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS		
						Percent		
						Recovery		
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes	
Chromium, Hexavalent	None	7196A	0.0400	0.0403	101	86-114		

Ham Rya Date: Approved By

QA/QC Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix: WATER Service Request: P0902698

Date Collected: 08/06/09

Date Collected: 08/06/09 Date Received: 08/06/09 Date Extracted: NA Date Analyzed: 08/06/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :

MW-13

Lab Code:

P0902698-001MS

P0902698-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	0.0312	0.0786	0.0786	95	95	80-120	<1	

Approved By KMU Rya Date: 8/H09 13

Report By:SAnderson



### CAS SR #P0902714

### **Table of Contents**

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### LABORATORY REPORT

August 7, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 7, 2009. For your reference, these analyses have been assigned our service request number P0902714.

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  $\gamma$  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.

ne. Curlste

Sue Anderson Project Manager

> Page 1 of *23*



2655 Park Conter Drive, Suite A

Simi Valley, CA 93065

805.526.7161

905 526 7270 fax

www.caslab.com

Client:

Battelle

CAS Project No:

P0902714

Project:

JPL GW Mon 3Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902714

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902714-001	MW-10	8/7/09	07:27
P0902714-002	MW-15	8/7/09	08:33
P0902714-003	SB-1-3Q09	8/7/09	09:12

# Columbia Analytical Services, Inc.

## Acronyms

California DHS LUFT Method CA LUFT

**ASTM** American Society for Testing and Materials BTEX Benzene/Toluene/Ethylbenzene/Xylenes Chemical Abstract Service Registry Number **CAS Number** 

Chlorofluorocarbon **CFC** 

Contract Required Detection Limit **CRDL** Duplicate Laboratory Control Sample DLCS

Duplicate Matrix Spike **DMS** DOH or DHS Department of Health Services U.S. Environmental Protection Agency **EPA** 

GCGas Chromatography

Gas Chromatography/Mass Spectrometry GC/MS

Ion Chromatography IC Initial Calibration Blank **ICB ICV** Initial Calibration Verification Laboratory Control Sample LCS Leaking Underground Fuel Tank LUFT

M Modified Method Method Detection Limit MDL Method Reporting Limit MRL

Matrix Spike MS

NC

Methyl tert - Butyl Ether MTBE Not Applicable NA Not Calculated

None Detected at or above the Method Reporting/Detection Limit (MRL/MDL) ND

NTU Nephelometric Turbidity Units

Parts Per Billion ppb Parts Per Million ppm

Practical Quantitation Limit **PQL** QA/QC Quality Assurance/Quality Control Resource Conservation and Recovery Act **RCRA** 

Relative Percent Difference RPD Selected Ion Monitoring SIM

Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995. SM Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, SW

Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.

Total Dissolved Solids TDS TPH Total Petroleum Hydrocarbons TSS Total Suspended Solids

Total Threshold Limit Concentration TTLC

VOA Volatile Organic Analyte(s) Volatile Organic Compound(s) VOC

# Qualifiers

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. U

The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.

В 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 lof

Columbia
Analytical
Services <sup>IMC</sup>
An Employee - Owned Company

2655 Park Center Drive, Suite A Simi Valley, California 93065 Phone (805) 526-7161 Eav (804) 526-770

Zn Acetate SOURCE BURNE **Asc Acid** Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Other 겊 Remarks က 4 5 9 5 CAS Contac 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 EDD required Yes / No Type: Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J required Yes / No 0 8270C 🗆 (Subcontracted) Semi-Volatile Organics GC/MS LPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) BTEX 8021B S260B ☐ Oxygenates ☐ TPH Gas Volatile Organics GC/MS JPL GW MWN 3009 ATIN GENALD TORNPENS 505 KING AVE Number of Containers Tier III - (Data Validation Package) 10% Surcharge 4325 P.O. # / Billing Information 214319 / SATIELLE CHUMBS , OH 0609845 Matrix 3 Project Number Project Name Sampler (Print & Sign) Time Collected Tier V - (client specified) 216 727 833 Date Collected ( 17/1/8 3990 OLD TOWN AVE., C-205 Company Name & Address (Reporting Information) Fax (805) 526-7270 Laboratory ID Number SAN DIEGO, CA GLID 6 CONNER Email Address for Result Reporting Tier 1 - (Results/Default if not specified) Report Tier Levels - please select 3005 1157-227 (2) BATIELLE Tier II - (Results + QC) Project Manager MW-15 DAVID スマーロ Client Sample ID Ì 58-

Cooler / Blank / Ice / No Ice

Time

Received by: (Signet

Tesol Tesol

Relinquished by: (Signature)

Relinquish (Signature) Relinquished by: (Signature)

Temperature .

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902714

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902714-001.01					
	7196A				
		8/7/09	1125	SMO / SSTAPLES	
		8/7/09	1136	In Lab / SANDERSON	
		8/7/09	1627	P-37 / SANDERSON	
P0902714-002.01					
	7196A				
		8/7/09	1125	SMO / SSTAPLES	
		8/7/09	1136	In Lab / SANDERSON	
		8/7/09	1627	P-37 / SANDERSON	
P0902714-003.01					
	7196A				
		8/7/09	1125	SMO / SSTAPLES	
		8/7/09	1136	In Lab / SANDERSON	
		8/7/09	1627	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle			•	_	Work order:	P0902714			***************************************
**		3Q09 / G486090								
. ,	s) received on:			-	Date opened:		by:	SSTAF		
		l samples received by CAS				_			indication	1 of
compliance	or nonconformity.	Thermal preservation and	l pH will only be	evaluated either a	the request of t	the client and/or as re	equired by the meth	od/SOP. <u>Yes</u>	No	<u>N/A</u>
1	Were sample	containers properly r	narked with cl	ient sample ID	)?			$\boxtimes$		
2	-	upplied by CAS?		•				X		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Was a chain-o	of-custody provided?						X		
5	Was the chain	-of-custody properly	completed?					X		
6	Did sample co	ontainer labels and/o	r tags agree wi	ith custody par	ers?			X		
7	Was sample v	olume received adequ	uate for analys	sis?				X		
8	Are samples w	vithin specified holdin	ng times?					$\times$		
9	Was proper te	mperature (thermal p	preservation) (	of cooler at rec	eipt adhered	to?		$\times$		
	C	ooler Temperature		°C Blank	l'emperature	2	°C			
10	Was a trip bla	nk received?								$\times$
	Trip blank s	upplied by CAS:	4		. ,		_			
11	Were custody	seals on outside of co	ooler/Box?						$\times$	
	Location of	seal(s)?					_Sealing Lid?			$\boxtimes$
	_	ure and date included	?							$\boxtimes$
	Were seals in									$\boxtimes$
	-	seals on outside of sa	mple containe	r?					X	
	Location of	* *					_Sealing Lid?			$\boxtimes$
	_	are and date included:	?							$\boxtimes$
	Were seals in									$\overline{\times}$
12		have appropriate pre	•	-		Client specified in	nformation?	$\boxtimes$		
		nt indication that the s			reserved?					$\boxtimes$
	Were <b>VOA v</b> i	ials checked for prese	nce/absence o	f air bubbles?						$\times$
		nt/method/SOP requir	•		ample pH an	d <u>if necessary</u> a	lter it?			$\boxtimes$
13	Tubes:	Are the tubes cap	ped and intact	?						$\times$
		Do they contain n	noisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\times$
		Are dual bed badş	ges separated a	nd individuall	y capped and	l intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervation	
		Description	р <b>Н</b> *	pН	pН	(Presence/Absence	) (	Commer	ts	
P0902714		125mL Plastic NP								
P0902714		125mL Plastic NP								
P0902714	-003.01	125mL Plastic NP								
Explain a	ny discrepancies	: (include lab sample ID	numbers):							

<sup>\*</sup>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);

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Date Collected: 08/07/09 Date Received: 08/07/09

Service Request: P0902714

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-10	P0902714-001	0.010	0.003	1	NA	08/07/09 12:40	ND	
MW-15	P0902714-002	0.010	0.003	1	NA	08/07/09 12:40	ND	
SB-1-3Q09	P0902714-003	0.010	0.003	1	NA	08/07/09 12:40	ND	
Method Blank	P0902714-MB	0.010	0.003	1	NA	08/07/09 12:40	ND	

Karr Rya Date:

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902714

Date Analyzed: 08/07/09

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	0.003	ND
CCBI	0.010	0.003	ND

Approved By: KMW RyM Date: 8/7/09

QA/QC Report

Client:

Battelle

**Project:** 

JPL GW Mon 3Q09 / G486090

Service Request: P0902714

Date Analyzed: 08/07/09

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	Acceptance Criteria
ICV	0.0579	0.0551	95	90-110
CCVI	0.0579	0.0551	95	90-110

Approved By: Kar Rya

Date: 8/7/09

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

**Project Number:** Sample Matrix:

G486090 WATER

Service Request:

P0902714

Date Collected: Date Received:

NA NA

Date Extracted:

NA

Date Analyzed: 08/07/09

Laboratory Control Sample Summary

**Inorganic Parameters** 

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0902714-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0397	99	86-114	

Karen Rya Date:

QA/QC Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

**Project Number:** G486090 **Sample Matrix:** WATER Service Request: P0902714

Date Collected: 08/07/09

Date Received: 08/07/09

Date Extracted: NA

Date Analyzed: 08/07/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: Lab Code: MW-10

: P090

P0902714-001MS

P0902714-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0510	0.0510	102	102	80-120	<1	

Approved By Kall Rya Date: 8/7/09 13



# CAS SR #P0902763

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Havavalent Chromium Raw Data	14-23

# LABORATORY REPORT

August 13, 2009

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

**RE: JPL GW Mon 3Q09 / G486090** 

Dear David:

Enclosed are the results of the sample submitted to our laboratory on August 12, 2009. For your reference, these analyses have been assigned our service request number P0902763.

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.

hellste-

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager



2656 Park Centor Drive, Suite /

Simi Valley, CA 93065

805.526.716

805 526 7270 fax

www.caslab.com

Client:

Battelle

CAS Project No:

P0902763

Project:

JPL GW Mon 3Q09 / G486090

# **CASE NARRATIVE**

The sample was received intact under chain of custody on August 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 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 GW Mon 3Q09/G486090

Service Request: P0902763

# SAMPLE CROSS-REFERENCE

SAMPLE # P0902763-001 **CLIENT SAMPLE ID** 

MW-5

<u>DATE</u>

<u>TIME</u>

8/12/09

07:32

# 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 MethodMDL Method Detection LimitMRL 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 Billionppm 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

Water & Soil - Chain of Custody Record & Analytical Service Request		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	Analysis Method and/or Analytes CAS Contact:		/ MON <b>3</b> ao/	(bət	·	TPH Gar	Town tract	ca GC/N Subscon Subsco	9 coinsg. 608 © 0x)	Time Number of Secretary Collected Containers Container									Tier III - (Data Validation Package) 10% Surcharge MRL required Yes / No EDD required Yes / No MRL squired Yes / No MRL squired Yes / No MRL squired Yes / No Trans reaction to the control of the contro	The state of the s	1.55 III.B. 2. Received by (Signature)	<u>√</u>
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	2655 Park Center Drive, Suite A Simi Valley, California 93065	Phone (805) 526-7161 Fax (805) 526-7270	Reporting Information)	) }	NAVE, C-20	01/26 80		NOR		гах		Laboratory Date ID Number Collected	(1) 8/11/0g										No.	
	Analytical Services **c		Company Name & Address (F	BATTELLE	2000 OLD TONN AVE, C.200	1 1 1 1 1 1 1 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 0 1 1 1 0 1	シャッ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	Project Manager	7 7 7 7	6/9-726-73/I	Email Address for Result Reporting	Client Sample ID	MWS	44W-6							Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + OC)	Balldon icefood by: (Singstude	Heineushing Of (Standure)	THE TAIN A STANKE OF THE STANKE WINDS

Temperature 38° °C Cooler / Blank / Ice / No Ice

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902763

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902763-001.01					
	7196A				
		8/12/09	1057	SMO / MZAMORA	
		8/12/09	1057	P-37 / MZAMORA	
		8/12/09	1127	In Lab / SANDERSON	
		8/12/09	1417	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle Work of	order:	P0902763			
	JPL GW Mon 3Q09 / G486090					
	(s) received on: $08/12/09$ Date opened: $08/12/09$		by:	MZAN		***************************************
	form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to in	-			indication	of
compliance	or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client a	nd/or as req	uired by the meth	od/SOP. <u><b>Yes</b></u>	<u>No</u>	<u>N/A</u>
1	Were sample containers properly marked with client sample ID?			$\boxtimes$		
2	Container(s) supplied by CAS?			X		
3	Did sample containers arrive in good condition?			$\times$		
4	Was a chain-of-custody provided?			$\times$		
5	Was the <b>chain-of-custody</b> properly completed?			$\times$		
6	Did sample container labels and/or tags agree with custody papers?			$\times$		
7	Was sample volume received adequate for analysis?			$\times$		
8	Are samples within specified holding times?			$\times$		
9	Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?			$\times$		
	Cooler Temperature °C Blank Temperature	3	°C			
10	Was a trip blank received?					$\times$
	Trip blank supplied by CAS:		-	_	_	_
11	Were custody seals on outside of cooler/Box?				$\overline{\times}$	
	Location of seal(s)?		Sealing Lid?			$\boxtimes$
	Were signature and date included?					X
	Were seals intact?					$\boxtimes$
	Were custody seals on outside of sample container?		C = 11 r : 49		$\boxtimes$	
	Location of seal(s)?  Were signature and date included?		Sealing Lid?			$\boxtimes$
	Were seals intact?					$\boxtimes$
12	Do containers have appropriate <b>preservation</b> , according to method/SOP or Client spe	ecified int	formation?	$\boxtimes$		
12	Is there a client indication that the submitted samples are <b>pH</b> preserved?	orried in	ormanon.			$\boxtimes$
	Were VOA vials checked for presence/absence of air bubbles?					$\boxtimes$
	Does the client/method/SOP require that the analyst check the sample pH and if necessary	essa <del>r</del> v alta	er it?			$\boxtimes$
13	Tubes: Are the tubes capped and intact?	cssary are	or it.			$\boxtimes$
10	Do they contain moisture?					$\boxtimes$
14	Badges: Are the badges properly capped and intact?					$\boxtimes$
* '	Are dual bed badges separated and individually capped and intact?					$\boxtimes$
Laks		eadspace	Dassin	t / Preso		
Eno C		e/Absence)		commen		
P0902763						
					***************************************	
				part to the		
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Explain at	ny discrepancies: (include lab sample ID numbers):					

<sup>\*</sup>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);

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090

Sample Matrix:

WATER

Service Request: P0902763

Date Collected: 08/12/09

Date Received: 08/12/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-5	P0902763-001	0.010	0.003	1	NA	08/12/09 12:45	ND	
Method Blank	P0902763-MB	0.010	0.003	1	NA	08/12/09 12:45	ND	

Kaller Rya Date: \$\frac{13/09}{}{}

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902763

Date Analyzed: 08/12/09

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	0.003	ND
CCBI	0.010	0.003	ND

QA/QC Report

Client: Project:

Battelle

JPL GW Mon 3Q09 / G486090

Service Request: P0902763

Date Analyzed: 08/12/09

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	Acceptance Criteria
ICV	0.0579	0.0574	99	90-110
CCVI	0.0579	0.0584	101	90-110

Approved By:

CCV1A/120594

Date: 8/13/09

Karen Rya

QA/QC Report

Client: Battelle

**Project Name:** JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix: WATER Service Request: P0902763

Date Collected: NA
Date Received: NA
Date Extracted: NA

**Date Analyzed:** 08/12/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample

Lab Code: P0902763-LCS

Test Notes:

Units: mg/L (ppm)

010

Basis: NA

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium Hexavalent	None	7196A	0.0400	0.0418	105	86-114	

Approved By Kaller Rya Date: 8/13/09 12

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902763

**Date Collected:** 08/12/09

**Date Received:** 08/12/09

Date Extracted: NA

Date Analyzed: 08/12/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-5

Lab Code:

P0902763-001MS

P0902763-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0491	0.0512	98	102	80-120	4	

Karen Ryan Date: 8/13/07

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902483

**Date Collected:** 07/22/09 **Date Received:** 07/22/09

Date Extracted: NA **Date Analyzed:** 07/22/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: Lab Code:

MW-14-3

P0902483-001MS

P0902483-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result		Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0498	0.0498	100	100	80-120	<1	

Kaur Rya Date: 7/23/09 Approved By



# CAS SR #P0902513

# **Table of Contents**

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Acronym List	4
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Internal Chain of Custody	7-8
Sample Acceptance Check Form	
Hexavalent Chromium Analytical Data	11-1
Hexavalent Chromium Raw Data	18-2



# LABORATORY REPORT

July 27, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 23, 2009. For your reference, these analyses have been assigned our service request number P0902513.

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 28 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.

Queleste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>28</u>



Client: Project: Battelle

JPL GW Mon 3Q09 / G486090

CAS Project No:

P0902513

# **CASE NARRATIVE**

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

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.

**NELAP Accredited** 

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902513

# SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0902513-001	MW-18-4	7/23/09	08:16
P0902513-002	MW-18-3	7/23/09	09:01
P0902513-003	MW-18-2	7/23/09	09:58
P0902513-004	DUPE-3-3Q09	7/23/09	00:00
P0902513-005	EB-3-7/23/09	7/23/09	09:25
P0902513-006	MW-3-4	7/23/09	11:30
P0902513-007	MW-3-3	7/23/09	11:52
P0902513-008	MW-3-2	7/23/09	12:10

# 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 Billionppm 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.

# Page | of

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

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

Requested Turnaround Time Day (100%) 2 Day (75%)
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Lay (of	rax (ono) 520-1210	_	۷			-									7
		T						Analy	Analysis Method and/or Analytes	id/or Analy	tes	<u>o</u>	CAS Contact:		
Company Name & Address (Reporting Information)	ng informatio		Project Name	<u>e</u>										2	7
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	•	١	9						Prese	Preservative Code				Preservative Key	_
3990 DLD TOWN AVE, , C-LOS	2 , 6-20		しとららど	2 180 3	7009				0					0 None	
SAN DIES, CA 9	0176		Project Number	ıber			(pəţ								***********
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Project Manager				DO # / Billing Information		Gas									
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		<u> </u>	シャンドン	SCINC AVE	_	j sət	12B	C/W	72					6 Asc Acid	면
16.9726-7311		<u> </u>	4		istan no		Ju2) 08 le	)5) sc						7 Other	
Email Address for Result Reporting	San	noler (Pr	int & Sign)			γxΟ	MTI B D	anic	)						
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		$\mid$				978	osel lesel	itslo	1				<u></u>		
Client Sample ID Lab	Laboratory D ID Number Coll	Date Collected C	Time Collected	Matrix	Number of Containers	Volatile 624 🗆 TPH Ga	8 X3T8 ig H9T ig H9T	TPH Fi Semi-Vo 625 □	1)					Remarks	
MW-18-4	11/1	7/13/29 9	816	3	-	1		4	X						
NW-18-3		3	106		1				\ \ \						
Κ			856		d				X				7	45/450	
DUPE- 3-3009	-J.				1				X				7	Jugare	
EB- 3-7/13/29		-	525		7			$\dashv$	X				7	EWUIP. BLANK	2
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Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results, + QC)	Tier I	Tier III - (Data Validation Tier V - (client specified).	Validation Papecified)	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	Surcharge		MRL required Yes / No MDL / PQL/ J required	Yes / No	/ No puired Yes / No	EDD requir Type:	EDD required Yes / No Type:	<u></u>	Project Requi	Project Requirements (MRLs, QAPP)	<u>a</u>
Relinquished by: (Signature)			2012/14EG	Ting. 225		(Signature)	1	B	KXX K		11.1.1.2. (V.) Til	Time 3 25			
Relinguistre by (Bignature)	777	1	Date: 1/2 C	Time: // 1/	<b>Ž</b>	erved by: (Signature)		X	X		3.00	300	Cooler / Blan	Cooler / Blank / Ice / No Ice	
Relinquished by: (Signature)			Date:	Time:	Received by:	eived bý: (Signatūre)	)				Dáte: ( Til	Time:	Temperature_	°	

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

Page of		CAS Project No-	CAS Contact:		Preservative Key	0 None		2 HN03			6 Asc Acid	7 Other			Remarks	MS/MSD			F-(1)110 At Ank				
Water & Soil - Chain of Custody Record & Analytical Service Request		Λ			Preservative Code																		
stody Record & Analyt		naround Time in Business Days (Surcharges) please circle 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard	Analysis Method and/or Analytes	4	Preserva	۵	(þəį	ontrac	opqn	racte ⊃ (S actec	cont 2B ( sufre	du2) 108 le odu2 OD so	□ 8 eve. (c) [v]	= 80124 = 80124 = 80124	TPH Gas SET & 82 TPH Dies TPH Dies TPH Dies TPH Dies TPH Dies TPH Dies TPH Gas TPH TPH Gas TPH	×	(×	×					
- Chain of Cus		Requested Turnaround Time in 1 Day (100%) 2 Day (75%) 3 Di				1 MW 3009					2 John Aller	24 AVE	GC OX	□ 809		W	<b>T</b>						
Water & Soil	2655 Park Center Drive, Suite A Simi Valley, California 93065		t	nation) Project Name	•		Project Number	0609869	P.O. # / Billing Information	2143191	ATTA G	505 1906 AVE	Sampler (Print & Sign)	Sample (Fillit & olgri)	Date Time N	1/23/29 1130 V	7511	1210					
	Columbia 2655 Park Center Drive, Suite Analytical Simi Valley, California 93065			Company Name & Address (Reporting Information)	E	our Town Ave., C-205		0175 8 1000	-	02000	Fax	7211	Email Address for Bosult Boporting		Laboratory ID Number	3-4	-3	)-2   S	- / /04				
# 6	Colum	An Employee - Owned Company		Company Name	1 BAMELLE	3990	C	2 2 7	Project Manager	DAVID	Phone	1126-36-711	Email Address	בוומו אממופסס	Client Sample ID	MW-3	MW-3	MW-3	£8-				

Project Requirements (MRLs, QAPP)

EDD required Yes / No Type:

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

Tier III - (Data Validation Package) 10% Surchafge Tier V - (client specified)

Tier II - (Results/Default if not specified)
Tier II - (Results + QC) Report Tier Levels - please select

Refinquished by: (Signature) Relinquished by: (Signature)

Relinquished by: (Signath

71269

Date:

ပွ

Cooler / Blank / Ice / No Ice

Pate: 3

# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project: JPL GW Mon 3Q09/G486090

Service Request: P0902513

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed Or
20902513-001.01					
	7196A	<b>5/00</b> /00	1.420	ON CO / COTTA DV FG	
		7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09 7/23/09	1442 1608	In Lab / SANDERSON P-37 / SANDERSON	
		7/23/09	1008	F-377 SANDERSON	
20902513-002.01					
	7196A	7/22/00	1.420	SMO / SSTADI ES	
		7/23/09	1420 1421	SMO / SSTAPLES P-37 / SSTAPLES	
		7/23/09		In Lab / SANDERSON	
		7/23/09 7/23/09	1442 1608	P-37 / SANDERSON	
		1/23/09	1000	1-3// SANDERSON	
20902513-003.01	<b>-</b> 10.51				
	7196A	7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1420	P-37 / SSTAPLES	
		7/23/09	1441	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
		7723707	1000	1 377 511115511	
20902513-003.02		- / /0.0		0.40 / 0.00	
		7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1441	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
P0902513-004.01					
	7196A				
		7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1441	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
20902513-005.01					
	7196A				
		7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1442	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
P0902513-006.01					
	7196A				
		7/23/09	1420	SMO / SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1442	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
P0902513-006.02					
,		7/23/09	1421	SMO/SSTAPLES	
D : . 17/07/00 0 01		Internal Obeside	of Custody Su		Page 1

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902513

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed On
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1441	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
P0902513-007.01					
	7196A				
		7/23/09	1420	SMO/SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1441	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	
P0902513-008.01					
	7196A				
		7/23/09	1420	SMO/SSTAPLES	
		7/23/09	1421	P-37 / SSTAPLES	
		7/23/09	1442	In Lab / SANDERSON	
		7/23/09	1608	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		~ <b></b> .			Work order:	P0902513			
		3Q09 / G486090			•					
Sample(s	s) received on:	07/23/09			Date opened:	07/23/09	by:	SSTAP	LES	
		ll samples received by CAS.							ndication	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 No								<u>N/A</u>		
1	Wara sampla	containers properly n	narked with cl	ient sample ID	19			$\boxtimes$		
1	_	supplied by CAS?	narcu wim ci	icht sampic iD	· •			$\boxtimes$		
2 3	* *	ontainers arrive in go	od condition?					$\boxtimes$		
	-		ou condition.					$\boxtimes$		
4	Was a <b>chain-of-custody</b> provided?  Was the <b>chain-of-custody</b> properly completed?						$\boxtimes$			
5			_	th austadu nan	org?			$\boxtimes$		
6	-	ontainer labels and/or			)C18 :			$\boxtimes$		
7		volume received adequ		18 (				$\boxtimes$		
8	-	within specified holdin	_	C 1	المسمطالية عيث	Q		$\boxtimes$		
9	1 1	emperature (thermal p	•				°C			
1.0		Cooler Temperature		°C Blank T	Temperature	3				$\boxtimes$
10	-	ank received?								ŭ
	-	supplied by CAS:	1 /D 0				_		$\times$	
11					01:1:49			$\boxtimes$		
	Location of seal(s)? Sealing Lid?									
	_	ture and date included?	?							$\boxtimes$
	Were seals									$\boxtimes$
	Were custody seals on outside of sample container?					$\boxtimes$				
	Location of seal(s)? Sealing Lid?						$\boxtimes$			
	Were signat	ture and date included?	?							$\boxtimes$
	Were seals									$\overline{\times}$
12	Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?				nformation?	$\times$				
	Is there a client indication that the submitted samples are <b>pH</b> preserved?								$\times$	
	Were <b>VOA</b> v	<u>v<b>ials</b></u> checked for prese	nce/absence o	f air bubbles?						$\times$
	Does the clie	nt/method/SOP requir	e that the analy	yst check the s	ample pH and	l if necessary a	lter it?			X
13	Tubes:	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							$\times$
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\boxtimes$
	8	Are dual bed bad			ly capped and	intact?				$\times$
1 1	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receir	t / Pres	ervatio	1
£4U s	շուսիլը 117	Description	pH*	pH	pH	(Presence/Alsence		Commei		^
P0902513	2 001 01	125mL Plastic NP								
P0902513		125mL Plastic NP								
P0902513		125mL Plastic NP								
P0902513		125mL Plastic NP								
P0902513		125mL Plastic NP								
P0902513		125mL Plastic NP								
Explain a	ny discrepancie	s: (include lab sample ID	numbers):							

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0902513	
Project: JPL GW Mon 3Q09 / G486090			The second secon
Sample(s) received on: 07/23/09	Date opened: 07/23/09	by:	SSTAPLES

Lab Sample ID	Container	Required	Received		VOA Headspace	
	Description	p <b>H</b> *	pН	pН	(Presence/Absence)	Conments
P0902513-006.01	125mL Plastic NP					
P0902513-006.02	125mL Plastic NP					
P0902513-007.01	125mL Plastic NP					
P0902513-008.01	125mL Plastic NP					
300 Annua						
***************************************						
						the state of the s
						- AAAAAAAA
				1		

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

**Project Number:** G486090 **Sample Matrix:** WATER

**Date Collected:** 07/23/09 **Date Received:** 07/23/09

Chromium, Hexavalent

0.003

0.003

0.010 0.010

P0902513-008

P0902513-MB

Prep Method: None

Analysis Method: 7196A

Test Notes:

Sample Name

MW-18-4

MW-18-3

MW-18-2

MW-3-4

MW-3-3

MW-3-2

DUPE-3-3Q09

EB-3-7/23/09

Method Blank

Units: mg/L (ppm)

Basis: NA

07/23/09 15:38

07/23/09 15:38

ND

ND

Dilution Date Date/Time Result Factor **Extracted** Analyzed Result Notes Lab Code MDL **PQL** NA 07/23/09 15:38 ND P0902513-001 0.010 0.003 1 07/23/09 15:38 ND 0.003 NA P0902513-002 0.010 1 ND P0902513-003 0.010 0.003 NA 07/23/09 15:38 NA 07/23/09 15:38 ND P0902513-004 0.0100.003 1 ND NA 07/23/09 15:38 0.003P0902513-005 0.010 1 ND 0.010 0.003 1 NA 07/23/09 15:38 P0902513-006 ND P0902513-007 0.010 0.003 1 NA 07/23/09 15:38

1

NA

NA

Approved By Kare Rya Date: 7/24/09 12

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902513

Date Analyzed: 07/23/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:

Karu Rya

ICCBMDL/120594

\_\_\_\_\_Date: 7/24/09

WBMIX.XLT

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902513

Date Analyzed: 07/23/09

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	Acceptance Criteria
ICV	0.0579	0.0604	104	90-110
CCVI	0.0579	0.0593	102	90-110
CCV2	0.0579	0.0593	102	90-110

Approved By:

CCV1A/120594

\_\_\_\_ Date: \_\_\_\_\_**7/24/09** 

14

Kam Rya

QA/QC Report

Client: Battelle

JPL GW Mon 3Q09

Project Name : Project Number :

G486090

Sample Matrix: WATER

Service Request: P0902513

Date Collected: NA
Date Received: NA
Date Extracted: NA

Date Analyzed: 07/23/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample

P0902513-LCS

Lab Code: Test Notes:

Units: mg/L (ppm)

Basis: NA

CAS Percent Recovery Acceptance Prep Analysis Percent Result Limits Method Notes Method True Value Result Recovery Analyte 0.0400 Chromium, Hexavalent None 7196A 0.0405 101 86-114

Approved By Kall 74 Date: 7/24/09 15

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix :

WATER

Service Request: P0902513

**Date Collected:** 07/23/09 **Date Received:** 07/23/09

Date Extracted: NA Date Analyzed: 07/23/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-18-2

Lab Code:

P0902513-003MS

P0902513-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result	_ •	oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0510	0.0499	102	100	80-120	2	

Karen Ryan \_\_\_\_\_ Date : \_\_\_\_\_ 7/24/09

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902513

Date Collected: 07/23/09 Date Received: 07/23/09

Date Extracted: NA

Date Analyzed: 07/23/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-3-4

Lab Code:

P0902513-006MS

P0902513-006DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	•	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0572	0.0530	114	106	80-120	8	

Karen Ryan Date: 7/24/09



### CAS SR #P0902528

### **Table of Contents**

Cover Letter	1	
Case Narrative	2	
Sample Cross-Reference	3	
	4	
	5	
	6	
Sample Acceptance Check Form	7-8	
Hexavalent Chromium Analytical Data	9-14	,
Hexavalent Chromium Raw Data		:4



### LABORATORY REPORT

July 27, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 24, 2009. For your reference, these analyses have been assigned our service request number P0902528.

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  $2\mu$  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,

Solumbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>24</u>



Client:

Battelle

CAS Project No:

P0902528

Project:

JPL GW Mon 3Q09 / G486090

### **CASE NARRATIVE**

The samples were received intact under chain of custody on July 24, 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 Service Request: P0902528

Project: JPL GW Mon 3Q09/G486090

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0902528-001	MW-21-5	7/24/09	07:20
P0902528-002	MW-21-4	7/24/09	07:43
P0902528-003	MW-21-3	7/24/09	08:18
P0902528-004	MW-21-2	7/24/09	08:40
P0902528-005	MW-21-1	7/24/09	09:05
P0902528-006	DUPE-4-3Q09	7/24/09	00:00
P0902528-007	EB-4-7/24/09	7/24/09	08:52

### 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

ppbParts Per BillionppmParts 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.

# Page of

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

SATELLE  3943 OLD TOWN ARE, C-25	Simi Valley, California 93065 Dhong (905) 526 7464		Turnaround	ime in Busines	S) sye(S	ola (aggradori	oloajo oses	0 0	- N
ートフェン	Fax (805) 526-7270	1 Day (1	1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day	(a) 3 Day (50%)	4 Day (35	%) 5 Day (25%	%) 10 Day - Standard	CAS Project No.	いないと
BATTELLE 1990 OLD TOWN AVE.	Information)	Project Name			Anal	/sis Method a	Analysis Method and/or Analytes	CAS Contact:	÷
						Prese	Preservative Code		Preservative Key
	<del></del>	≪!	NW. 3009			a			0 None
SAN DIEGO, CA 92110	2/10	Project Number							1 HCL 2 HNO3
		0486090	0						
Project Manager		P.O. # / Billing Information	nation	eq) SHC	(p	(			
DAVID CONNER		11-329 / B	Attend	D TH	S	795			5 Zn Acetate
Phone Fax	, ,	SUS KING AVE	S ISRAMINS ASE	npcou	C/W	11			
(6/4)726 - 731/   Email Address for Bosoult Bonording	) rolamoo	Columbus,	7H 43201	Oxyger	) soin	)			
Entail Address for Result Reporting	Sampler (r	Sampler (Print & Sign)		98015B ☐ 18 ☐ 0 18 ☐ 0 18 ☐ 0		加			
Client Sample ID Laboratory	ttory Date	Time Matrix Collected	Number of Containers	Volatile Or 624 □ 82 PTEX 802 TPH Diese TPH Diese	TPH FC   Semi-Vola S25 □ 82	70			Remarks
MW-21-5 (	1) Thulsa	N OIL	1			×		7	EVEL ID OC
MW-21-4	0	143 1				×			
MW-21-3 (3		818				×			
MW-21-2 A		oh8				×			
MW-21-1		305				×			
2016-4-3009 (B)						$\frac{1}{\sqrt{1}}$			DULATE
[3] 2c/21/-4-87	1	852	<del> </del>			  x			Man 10, Ou CITY
Report Tier Levels - please select	i							Project Requi	Project Requirements (MRLs, QAPP)
Tier 1 - (Results/Default if not specified)	Tier III - (Dats Tier V - (client	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	0% Surcharge	- MRL requ MDL / PQ	MRL required Yes / No MDL / PQL / J required Yes / No	d Yes / No	EDD required Yes / No Type:		
Relinquished by: (Signature)		Edy Sof rifted	0	Signature			John College of Colleg	150	
Relinquished by (Signature)		Time		Signature)	1	3	/ full 24/17 Seal	Cooler / Blank /	k / Ice / No Ice
elinquished by: (Signature)	/,	Date: Triple:	Received by: (Signature)	Signature)	\$ ₹	**************************************	Date: Time:	Femberature	3°C ° °

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902528

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902528-001.01					
	7196A	<b>5/2</b> / / / / / /	1101	(N/O / N/ZAN/ODA	
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1212	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON	
P0902528-002.01					
	7196A				
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1212	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON 💃	
20902528-003.01					
	7196A	<b>= (2.4</b> (0.0		0) (0) () (7) (0) (0)	
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1212	In Lab / SANDERSON	
	-	7/27/09	0820	P-37 / SANDERSON	
20902528-004.01					
	7196A				
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1211	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON	
P0902528-005.01					
	7196A				
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1211	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON	
20902528-006.01					
	7196A				
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1211	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON 🛴	
20902528-007.01					
	7196A				
		7/24/09	1131	SMO / MZAMORA	
		7/24/09	1131	P-37 / MZAMORA	
		7/24/09	1212	In Lab / SANDERSON	
		7/27/09	0820	P-37 / SANDERSON	

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance	Check Form	Work order:	P0902528			
		3Q09 / G486090			•					
	s) received on:				Date opened:	07/24/09	by:	MZAN	10RA	
Note: This	form is used fo <u>r al</u>	l samples received by CAS.	The use of this	form for custody s	seals is strictly m	neant to indicate pres	ence/absence and i	not as an	indication	n of
compliance	or nonconformity.	. Thermal preservation and	pH will only be e	evaluated either at	the request of the	he client and/or as re	quired by the meth		<b>%</b> 1.	<b>317.4</b>
					_			Yes	No	<u>N/A</u>
1	-	containers properly n	narked with cl	ient sample ID	)?			$\boxtimes$		
2	Container(s) s	supplied by CAS?						$\overline{\times}$		
3	Did sample c	<b>ontainers</b> arrive in goo	od condition?					$\boxtimes$		
4	Was a chain-	of-custody provided?						$\times$		
5	Was the chair	n-of-custody properly	completed?					$\times$		
6	Did sample c	ontainer labels and/or	tags agree wi	th custody pap	ers?			X		
7	Was sample v	volume received adequ	ate for analys	is?				$\times$		
8	_	within specified holding						X		
9	-	emperature (thermal p	_	of cooler at rec	eipt adhered t	to?		$\times$		
		Cooler Temperature	,		Temperature	3	°C			
10		ank received?		•	1					$\boxtimes$
10	-	upplied by CAS:								
11	•	seals on outside of co	oler/Box?				_		$\times$	
11	Location of		0101/2011.				Sealing Lid?			$\overline{\times}$
		ure and date included?		·····			_ Searing Bia.			$\overline{\times}$
	ě									$\boxtimes$
	Were seals i		1 a aamtaima	<b>.</b> າ					$\boxtimes$	
	-	seals on outside of sar	npre containe	[ <b>?</b>			Cooling Lid?			$\boxtimes$
	Location of	•					_Sealing Lid?			$\boxtimes$
	-	ure and date included?								
	Were seals i									$\boxtimes$
12		have appropriate pres				Client specified in	iformation?	$\overline{\times}$		
		ent indication that the s			reserved?					X
	Were <b>VOA</b> v	ials checked for presen	nce/absence o	f air bubbles?						X
	Does the clie	nt/method/SOP require	that the analy	st check the s	ample pH and	d <u>if necessary</u> al	ter it?			$\times$
13	Tubes:	Are the tubes capp	ed and intact	?						X
		Do they contain m	oisture?							$\times$
14	Badges:	Are the badges p		d and intact?						X
	Duagest	Are dual bed badg			v canned and	Lintact?				X
		ī	-		1					
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspac (Presence/Absence		it / Pres Commei		1
			1/4.4	hri	pii	(11esence Ansence	<u>'                                     </u>	-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
P0902528		125mL Plastic NP								
P0902528		125mL Plastic NP								
P0902528 P0902528		125mL Plastic NP 125mL Plastic NP								
P0902528		125mL Plastic NP						· · · · · · · · · · · · · · · · · · ·		
P0902528		125mL Plastic NP								
Explain a	ny discrepancies	s: (include lab sample ID	numbers):							
•	•	•								

<sup>\*</sup>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);

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

54	imple liecepeumee career i or		
Client: Battelle	Work order:	P0902528	
Project: JPL GW Mon 3Q09 / G486090			
Sample(s) received on: 07/24/09	Date opened: 07/24/09	by:	MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0902528-007.01	125mL Plastic NP					
1 0 0 0 2 0 2 2 2 3 0 0 7 . 0 1	125 ME I RESULT					
						ALL ALL MANAGEMENT AND A STATE OF THE STATE
43000						and the state of t
on						
MA						
the state of the s						
A CONTRACTOR OF THE CONTRACTOR						
2004						
	Į.	l	1	I	l	

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

## **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902528

**Date Collected:** 07/24/09 Date Received: 07/24/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-21-5	P0902528-001	0.010	0.003	1	NA	07/24/09 15:17	ND	
MW-21-4	P0902528-002	0.010	0.003	1	NA	07/24/09 15:17	ND	
MW-21-3	P0902528-003	0.010	0.003	1	NA	07/24/09 15:17	ND	
MW-21-2	P0902528-004	0.010	0.003	1	NA	07/24/09 15:17	ND	
MW-21-1	P0902528-005	0.010	0.003	1	NA	07/24/09 15:17	ND	
DUPE-4-3Q09	P0902528-006	0.010	0.003	1	NA	07/24/09 15:17	ND	
EB-4-7/24/09	P0902528-007	0.010	0.003	1	NA	07/24/09 15:17	ND	
Method Blank	P0902528-MB	0.010	0.003	1	NA	07/24/09 15:17	ND	

Karen Rya Date :

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902528

Date Analyzed: 07/24/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Karen Ryan

Approved By:

ICCBMDL/120594

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902528

**Date Analyzed:** 07/24/09

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	Acceptance Criteria
ICV	0.0579	0.0554	96	90-110
CCV1	0.0579	0.0544	94	90-110
CCV2	0.0579	0.0544	94	90-110

Approved By: \_

CCV1A/120594

....

Date: 7/27/00

Karen Ryan

QA/QC Report

Client: Battelle

JPL GW Mon 3Q09

Project Name: Project Number:

G486090

Sample Matrix: WATER

Service Request: P0902528

Date Collected: NA
Date Received: NA
Date Extracted: NA

**Date Analyzed:** 07/24/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample

Lab Code: P0902528-LCS

Test Notes:

Units: mg/L (ppm)

Basis: NA

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0382	96	86-114	

Approved By KMU Rya Date: 7/27/09 13

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902528

**Date Collected:** 07/24/09

**Date Received:** 07/24/09 Date Extracted: NA

**Date Analyzed:** 07/24/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-21-5

Lab Code:

P0902528-001MS

P0902528-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result	_ *	oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0473	0.0473	95	95	80-120	<1	

Kar Rya Date: 7/27/09 Approved By



### LABORATORY REPORT

July 28, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 27, 2009. For your reference, these analyses have been assigned our service request number P0902542.

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.

Delesse-

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of 34

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client: Project:

Battelle

JPL GW Mon 3Q09 / G486090

CAS Project No:

P0902542

### CASE NARRATIVE

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

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902542

### SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0902542-001	MW-20-5	7/27/09	07:49
P0902542-002	MW-20-4	7/27/09	08:16
P0902542-003	MW-20-3	7/27/09	08:50
P0902542-004	MW-20-2	7/27/09	09:13
P0902542-005	MW-20-1	7/27/09	09:38
P0902542-006	DUPE-5-3Q09	7/27/09	00:00
P0902542-007	EB-5-7/27/09	7/27/09	09:26

### 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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

ppbParts Per BillionppmParts 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 & July - Chain of Custony mecolu & Analytical Service Hequest

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Page\_

2655 Park Center Drive, Suite A

Simi Valley, California 93065

CAS Project No. 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 Analysis Method and/or Analytes Phone (805) 526-7161 Fax (805) 526-7270 Columbia
Analytical
Services PC
An Employee - Owned Company

Company Name & Address (Reporting Information)	Project Name			•				***************************************
- SATIELLE					Preservative Code	ve Code	Preserv	Preservative Key
3990 OLD TOWN AVE, C-LUS	JOL ON MAN	W. 3009			0		0	None
SAN DIEGO, CA GAILO	Project Number	<del>9 (100 - 10</del>	(beta					HCL
	0509849				10-300-300-300-300-300-300-300-300-300-3		ο ο	HN03
Project Manager	P.O. # / Billing Information		(p		_		7 .	# 100 12 100 12
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Fax	TATIN GEALD TON	<u> </u>	S1B cont	sntra SMS	jι		ω	Asc Acid
(619) 726-7311	TAN DAIL COS	SW/		odu8 De ec	.)		_	Other
ddress for Result Reporting	Sampler (Print & Sign)	99 S	□ 8 ITM □ 88	5) Mč Sinseri				муйнасійн газахта
	To the second se		8012E	108 🗆	<u> </u>			and colline and comment and an and an and an and an an and an
Client Sample ID Laboratory Date ID Number Collected	Time Matrix	Number of O o	8.4 □ 88 87EX 80 7PH Dies 7PH Dies 7PH Dies	TPH FC	70		Ren	Remarks
MW-20-5 (1) 7/129/09	9 749 W	-						
MW-20-4 (2)	816				<u> </u>			
Mr- 23-3 (3)	253				\ \ \			
MW-20-2	913				\ \ \			
MW-20-1	938				X			
DUPE-5-3009 (B)					X		DUPL	CATE
EB-5-7/17/09 (2)	776				X		EWIP.	BLANK
		\						-
								***************************************
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			are the same second parameters are the same second	Marie Commence of the Commence	All the special property of th		Project Requirements (MRLs, QAPP)	IRLs, QAPP)
if not specified)	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	, Surcharge	MRL requ MDL / PQ	MRL required Yes / No MDL / PQL / J required Yes / No		EDD required Yes / No Type:		noipelanti esploidationelle
Relinquished by: (Signature)	2/09	Received by: (Signature)	ature)			DIX s'ewill By W Jelled.		
Relinquish 9: (Signature)	263	Received by: (Signature)	aturki 🚺		100 L	CT-MILETY CA	Cooler / Blank / Ice / No Ice	lce
Refinquished by: (Signature)	Date: / Time:	Received by: (Signature)	ature)	3		Date: Time:	Temperature	Ş

### Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

Drintad 7/28/00 11:50

JPL GW Mon 3Q09/G486090

Service Request: P0902542

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
20902542-001.01					
	7196A				
		7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1207	In Lab / SANDERSON	
20902542-002.01					
	7196A				
		7/27/09	1151	SMO / MZAMORA	•
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1206	In Lab / SANDERSON	
20902542-003.01	:	·			
	7196A				
		7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1207	In Lab / SANDERSON	
20902542-004.01					
	7196A				
		7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1207	In Lab / SANDERSON	
20902542-005.01					
	7196A				
	<b>)</b>	7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1207	In Lab / SANDERSON	
20902542-006.01					
	7196A				
		7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	
		7/27/09	1207	In Lab / SANDERSON	
20902542-007.01					
	7196A				
		7/27/09	1151	SMO / MZAMORA	
		7/27/09	1151	P-37 / MZAMORA	•
		7/27/09	1207	In Lab / SANDERSON	

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

	: Battelle					Work order:	P0902542			www.comen.edd.comen.edd
Project	t: JPL GW Mor	1 3Q09 / G486090								
Sample	e(s) received on	: 07/27/09		<del>-</del>	Date opened	: 07/27/09	by:	MZAN	ЛORA	
		ll samples received by CA								n of
compliance	e or nonconformity	. Thermal preservation an	d pH will only be	evaluated either a	it the request of t	the client and/or as r	equired by the meth			<u>N/A</u>
1	Wasa samala	4	manufacturith o	Liont commis III	<b>3</b> 2			<u>Yes</u> ⊠	<u>No</u>	
1	-	containers properly	marked with c	nem sample m	) (					
2		supplied by CAS?	1 11.1 0					X		
3	_	containers arrive in go						$\boxtimes$		
4		of-custody provided?						$\overline{\times}$		
5		n-of-custody properly	-					$\boxtimes$		
6	-	ontainer labels and/o			pers?			$\times$		
7	Was sample	volume received adeq	uate for analys	sis?				$\overline{\times}$		
8	Are samples v	within specified holdi	ng times?					$\times$		
9	Was proper to	emperature (thermal	preservation)	of cooler at rec	eipt adhered	to?		X		
	C	Cooler Temperature		°C Blank	Temperature	3	°C			
10	Was a trip bl	ank received?							$\times$	
	Trip blank s	supplied by CAS:					MANUSANA			
11	Were custody	seals on outside of c	ooler/Box?						$\times$	
	Location of	seal(s)?					Sealing Lid?			$\boxtimes$
	Were signat	ure and date included	?							$\times$
	Were seals i	intact?								$\times$
	Were custody	seals on outside of sa	imple containe	r?					$\times$	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?							$\boxtimes$
	Were seals i	intact?								$\boxtimes$
12	Do containers	have appropriate pro	eservation, acc	cording to met	hod/SOP or C	Client specified i	nformation?			$\times$
	Is there a clie	nt indication that the	submitted sam	ples are pH p	reserved?					$\boxtimes$
		rials checked for prese								X
		nt/method/SOP requir			ample nH and	d if necessary a	lter it?			$\boxtimes$
13		Are the tubes cap	· · · · · · · · · · · · · · · · · · ·	-	umpro pri um	a <u>ii iiceessai y</u> a	itel it.			$\boxtimes$
1.0	_ 40,001	Do they contain i		•				$\Box$		$\boxtimes$
1.4	Dodges	Are the badges p		d and intent?						$\boxtimes$
14	Badges:					1 : 40				$\boxtimes$
le and a second		Are dual bed bad		1						ادک
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac		t / Prese		ı
		Description	pH *	pН	pH	(Presence/Absence	) (	Commen	its	
P090254		125mL Plastic NP								
P090254		125mL Plastic NP							***	
P090254		125mL Plastic NP							***************************************	
P090254		125mL Plastic NP	-							
P090254 P090254		125mL Plastic NP 125mL Plastic NP						**************************************	***************************************	
1		s: (include lab sample II	) numbers).		<u> </u>	1				
rybram (	mry discrepancies	s, (morado no sample il	rumootoj.	***************************************				alebrane returnment and		

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0902542	
Project: JPL GW Mon 3Q09 / G486090			
Sample(s) received on: 07/27/09	Date opened: 07/27/09	by:	MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0902542-007.01	125mL Plastic NP					
·						
				<u> </u>		
		,				
		-				
			·			
				MOLECULAR DE LA COMPANSIONE DEL COMPANSIONE DE LA COMPANSIONE DE L		
				100000000000000000000000000000000000000		
		7.1				- Andrews Committee - Committe

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

# DIVIDER SHEET

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090

Sample Matrix :

WATER

Service Request: P0902542

Date Collected: 07/27/09

Date Received: 07/27/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-20-5	P0902542-001	0.010	0.003	1	NA	07/27/09 16:55	ND	
MW-20-4	P0902542-002	0.010	0.003	1	NA	07/27/09 16:55	ND	
MW-20-3	P0902542-003	0.010	0.003	1	NA	07/27/09 16:55	ND	
MW-20-2	P0902542-004	0.010	0.003	1	NA	07/27/09 16:55	ND	
MW-20-1	P0902542-005	0.010	0.003	1	NA	07/27/09 16:55	ND	
DUPE-5-3Q09	P0902542-006	0.010	0.003	1	NA	07/27/09 16:55	ND	
EB-5-7/27/09	P0902542-007	0.010	0.003	1	NA	07/27/09 16:55	ND	
Method Blank	P0902542-MB	0.010	0.003	1	NA	07/27/09 16:55	ND	

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902542

Date Analyzed: 07/27/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Hur PykICCBMDL/120594

Date:

7/28/09

WBMIX.XLT

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902542

Date Analyzed: 07/27/09

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	Acceptance Criteria
1CV	0.0579	0.0568	98	90-110
CCVI	0.0579	0.0568	98	90-110
CCV2	0.0579	0.0558	96	90-110

Approved By:

CCV1A/120594

Date:

F/28/0

Karen Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: Sample Matrix:

G486090 WATER

Date Received: Date Extracted:

Service Request :

Date Collected:

NA

Date Analyzed: 07/27/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P0902542-LCS

Units:

mg/L (ppm)

P0902542

NA

NA

Basis: NA

Test Notes:

						Percent	
Analyte	Prep Method	Analysis Method	True Value	Result	2 01 00111	Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0392	98	86-114	

Karl Ryc Date: Approved By

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Sample Matrix:

Project Number: G486090 WATER

Service Request: P0902542 Date Collected: 07/27/09

Date Received: 07/27/09 Date Extracted: NA

Date Analyzed: 07/27/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-20-5

Lab Code:

P0902542-001MS P0902542-001DMS Units: mg/L (ppm)

Basis: NA

Test Notes:

								Spike					
Analyte	Prep Method	Analysis Method	POL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS		overy DMS	CAS Acceptance	Relative Percent	Result Notes
Anaryte	Method	Method	TQL	IVIS	DIVIS	resure	1713	DMS	1713	DIVID	Limits	Difference	110000
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND .	0.0485	0.0465	97	93	80-120	4	

Karen Rya Date: Approved By

Danast Ruc CAnderson



## CAS SR #P0902557

## **Table of Contents**

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Hexavalent Chromium Analytical Data	10-15
Hexavalent Chromium Raw Data	



## LABORATORY REPORT

July 29, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 28, 2009. For your reference, these analyses have been assigned our service request number P0902557.

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.

Judestr

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of <u>\$5</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0902557

Project:

JPL GW Mon 3Q09 / G486090

## **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle Service Request: P0902557

Project: JPL GW Mon 3Q09/G486090

## SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902557-001	MW-17-4	7/28/09	07:38
P0902557-002	MW-17-3	7/28/09	08:05
P0902557-003	MW-17-2	7/28/09	08:35
P0902557-004	EB-6-7/28/09	7/28/09	08:22
P0902557-005	MW-4-3	7/28/09	09:53
P0902557-006	MW-4-2	7/28/09	10:23
P0902557-007	MW-4-1	7/28/09	10:44
P0902557-008	DUPE-6-3Q09	7/28/09	00:00

## 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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.

## Page \_\_\_\_ of \_\_\_

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

2655 Park Center Drive, Suite A

Simi Valley, California 93065 Phone (805) 526-7161 Fax (805) 526-7270

Services Inc.

Columbia Analytical

An Employee - Owned Company

CAS Project No. 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

Zn Acetate EDUIP. BLANK Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 Other None ပွ Remarks Cooler / Blank / Ice / No Ice N က 4 D. 9 / CAS Contact: Temperature Time, اق آ Time: EDD required Yes / No Type: Date Date Date: Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J required Yes / No X X 8270C (Subcontracted) Semi-Volatile Organics GC/MS TPH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B 

Gubcontracted) TPH Diesel 8015B □ (Subcontracted) 17PH Gas 8015B □ Received by: (Signature) Received by: (Signature) Received by: (Signature) Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas 🗆 191 GW Man 3009 Project Number 214319 / BATTELLE ATIN GERNS TONDIENS 505 ICING AVE Number of Containers SEWMBUS OF 4320 Tier III - (Data Validation Package) 10% Surcharge. Tier V - (client specified) P.O. # / Billing Information 05/12 Limes/150 6486090 Matrix 3 Time Time: Project Name Sampler (Print & Sign) Date Time Collected Collected 738 218 805 835 Date Date 3c/37/L 3990 OLD TOWN AVE , C-205 Company Name & Address (Reporting Information) 92110 Laboratory ID Number **Email Address for Result Reporting** 3 Tier 1 - (Results/Default if not specified) Report Tier Levels - please select 5<182/1 -9 SAN DIECO, (619)716-721, J Relinquished by: (Signature) MW-17-Fier II - (Results + QC) Project Manager スマーコ DAVID Client Sample ID MW-LJ EB-Phone

## Page / of /

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

	Water & 2655 Park Center Drive, Suite A Simi Valley California 93065	Wate er Drive, S	Water & Soil - Chain r Drive, Suite A	oii - C		of Custody Record & Analytical Service	dy Re	cord	& Ar	ıalytic	al Se	rvice	Request	est	Page	of
An Employee - Owned Company	Phone (805) 526-7161 Fax (805) 526-7270	6-7161 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	urnaround ) 2 Day (75	Time in Bu %) 3 Day (	<b>siness D</b> . 50%) 4 E	ays (Surcay (35%)	harges) 5 Day (	<b>please ci</b> 25%) 10		Standard		CAS P	ġ.	7.0
Company Name & Address (Reporting Information)	eporting Informa	ation)	Project Name	Je Je		1		Analysi	s Metho	Analysis Method and/or Analytes	Analytes			CAS Contact	ontact:	
BATTELLE			. ,						ď	Preservative Code	Code				Pre	Preservative Key
3990 OLD TOWN AVE,	AVE., C-205	20,5	JR GW	J TANK.	1.3009				٥						。 П	None
	CA 92110	0,	Project Number	ıber			(petos								- 2	HCL HNO3
			6486090	5090		as 🗆	ontra							w-w	· "	H2S04
<u>.</u>	,		P.O. # / Billir		Ju Ju Ju Ju Ju Ju Ju Ju Ju Ju Ju Ju Ju J		Subc		(9					******************	4	NaOH
80 C	NWER		メニンド	CALLEY CALLEY	これでは	ι, [	ntrac ) 🗆 (	SI	31							Zn Acetate
Phone Fax	×		515 500 55 755 555 755 555 755 555 755	KING ANT	1-11-4 Killed 12 14(20)	/WS	oodu8) Batos le	SS GC/M	'ム)					**************************************	9 2	Asc Acid Other
Email Address for Result Reporting		Sampler (	Sampler (Print & Sign)		1	9012B□ 90B□ Ox	Fow Leve		_ות							
Client Sample ID	Laboratory ID Number	Date Collected	Time	Matrix	Number of Containers	Volatile Org 624 🗆 826 TPH Gas 8 BTEX 802	TPH Diese TPH Diese	Semi-Volat	1)					***************************************		Remarks
MW-4-3		7/18/39	953	3	+1			┼	×							
MW - 4-3	7	1	1023	_				8								
MW- 4-1	g area are		hhol					<i>&gt;</i>	7							
			,													
DUPE - 6 -3009	JESS.		l					\ <u>\</u>							DUPU	YUMTE
											Market Assertance					
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									<u></u>			_	+	+		
Report Tier Levels - please select Tier I - (Results/Default if not specified)		ier III - (Da	Tier III - (Data Validation Package) 10% Surcharge	ackade) 10% (	Surcharde	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	MBL required Yes / No	(es / No		HDD.	required Ye	ON / St		Project	Requiremen	Project Requirements (MRLs, QAPP)
ier II (Results + QC)		ier V - (clier	Tier V - (client specified)	·	9	, MC	MDL / PQL / J required Yes / No	required Y	es / No	Type	Type:					
lelinguished by: (Signature)			1999/28/99 Time:	Time://50	Received by: (Signature)	(Signature)	1				Daye	2	Time!	Į.,		
télinquish 🐠: (Signaturé)		£0	Date:	Times	Received by: (Signature)	(Signature)	*		7		Date: 7		Time	Cooler	Cooler / Blank / Ice / No Ice	/ No Ice
Relinquished by: (Signature)	į		Date:	Time:	Received by: (Signature)	(Signature)	ja Na				Date:	_	Time:	Temperature	ature	ဝ

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902557

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902557-001.01					
	7196A	# (20 /00	1220	ON A CASTARY FO	
		7/28/09	1229	SMO / SSTAPLES	
		7/28/09 7/28/09	1250 1432	In Lab / SANDERSON P-37 / SANDERSON	
		1/28/09	1432	1-5// SANDERSON	
P0902557-002.01	71061				
	7196A	7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1250	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
20002557 002 01					
P0902557-003.01	7196A				
	/1/0/1	7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1249	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
P0902557-004.01	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>				•
0702337-004.01	7196A				
		7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1250	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
P0902557-005.01					
	7196A				
		7/28/09	1229	SMO/SSTAPLES	
		7/28/09	1250	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
P0902557-006.01					
	7196A				
		7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1249	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
20902557-007.01					
	7196A			0.40 / 0.00 / 7.	
		7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1250	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	
P0902557-008.01					
	7196A	#/00/00	1220	CNAO / CCTA DI EC	
		7/28/09	1229	SMO / SSTAPLES	
		7/28/09	1249	In Lab / SANDERSON	
		7/28/09	1432	P-37 / SANDERSON	

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle		Sampi			Work order:	P0902557			
		3Q09 / G486090		· · · · · · · · · · · · · · · · · · ·						
	s) received on:				Date opened:		by:	SSTAF		- Vandaria Vandaria
		samples received by CAS							ndication	of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either at	the request of th	e client and/or as re	quired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	N/A
1	Were sample	containers properly n	narked with cl	ient sample ID	?			$\times$		
2	Container(s) s	supplied by CAS?						$\times$		
3	Did sample co	ontainers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-	of-custody provided?						$\times$		
5	Was the chair	ı-of-custody properly	completed?					$\times$		
6	Did sample c	ontainer labels and/or	tags agree wi	th custody pap	ers?			$\times$		
7	Was sample v	olume received adequ	ate for analys	is?				$\times$		
8	Are samples v	vithin specified holdin	g times?					X		
9	Was proper te	mperature (thermal p	oreservation) o	f cooler at rec	eipt adhered t	o?		$\times$		
	C	ooler Temperature	4	°C Blank 7	Cemperature		°C			
10	Was a trip bla	ank received?			•		_			$\boxtimes$
	Trip blank s	upplied by CAS:					_			
11	Were custody	seals on outside of co	ooler/Box?						$\times$	
	Location of	seal(s)?					_Sealing Lid?			$\times$
	Were signat	ure and date included	?							$\times$
	Were seals i	ntact?								$\times$
	Were custody	seals on outside of sa	mple containe	r?					$\times$	
	Location of		•				Sealing Lid?			$\times$
		ure and date included	?				<del></del>			$\times$
	Were seals i									$\times$
12		have appropriate pre	servation, acc	ording to metl	nod/SOP or C	lient specified in	nformation?	$\times$		
12		nt indication that the s				-				$\boxtimes$
		ials checked for prese	·	• •						$\boxtimes$
	WIE	nt/method/SOP requir			amnla nU and	l if nacessary a	Iter it?			$\boxtimes$
1.2	Tubes:	Are the tubes cap			апіріс ріт апс	i <u>ii necessary</u> a	tter it:			$\boxtimes$
13	Tubes:	•	•	•						$\boxtimes$
		Do they contain n		1 1 1 4 40						
14	Badges:	Are the badges p			, ,					$\boxtimes$
		Are dual bed bad	ges separated a	ind individuali	y capped and	intact?		Ш		
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac		ot / Pres Commei		1
		Description	pH *	pН	pН	(Presence/Absence	<u>'</u>	comme	113	
P090255		125mL Plastic NP								
P0902557		125mL Plastic NP		-						
P0902557 P0902557		125mL Plastic NP 125mL Plastic NP								
P090255		125mL Plastic NP								
P090255		125mL Plastic NP								
Explain a	ny discrepancie	s: (include lab sample ID	numbers):							

<sup>\*</sup>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);

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work or	rder: P0902557	
Project: JPL GW Mon 3Q09 / G486090			
Sample(s) received on: 07/28/09	Date opened: 07/28/09	9 by:	SSTAPLES

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receipt / Preservation
•	Description	рН *	рН	pН	(Presence/Absence)	
P0902557-007.01	125mL Plastic NP					
P0902557-008.01	125mL Plastic NP					
					***************************************	
						1.00-1
	· · · · · · · · · · · · · · · · · · ·					
AND						

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

## **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

## Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090

Sample Matrix:

WATER

Service Request: P0902557

Date Collected: 07/28/09

**Date Received:** 07/28/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-17-4	P0902557-001	0.010	0.003	1	NA	07/28/09 13:50	ND	
MW-17-3	P0902557-002	0.010	0.003	1	NA '	07/28/09 13:50	ND	
MW-17-2	P0902557-003	0.010	0.003	1	NA	07/28/09 13:50	ND	
EB-6-7/28/09	P0902557-004	0.010	0.003	1	NA	07/28/09 13:50	ND	
MW-4-3	P0902557-005	0.010	0.003	1	NA	07/28/09 13:50	ND	
MW-4-2	P0902557-006	0.010	0.003	1	NA	07/28/09 13:50	ND	
MW-4-1	P0902557-007	0.010	0.003	1	NA	07/28/09 13:50	ND	
DUPE-6-3Q09	P0902557-008	0.010	0.003	1	NA	07/28/09 13:50	ND	
Method Blank	P0902557-MB	0.010	0.003	1	NA	07/28/09 13:50	ND	

Karu Rya Date : \_\_\_\_

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902557

Date Analyzed: 07/28/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:	Karu-	Rua	Date:	7/29/09	,
-FF 7 <u></u>	110000	1 1/2	 _		
CCBMDL/120594		/ 1			

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902557

Date Analyzed: 07/28/09

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	Acceptance Criteria
ICV	0.0579	0.0554	96	90-110
CCV1	0.0579	0.0574	99	90-110
CCV2	0.0579	0.0574	99	90-110

Approved By:

CCV1A/120594

\_\_\_\_\_ Date: \_\_\_\_**7/39/09** 

Karen Ryan

QA/QC Report

Client: Battelle

JPL GW Mon 3Q09 **Project Name:** G486090 **Project Number:** Sample Matrix: WATER

P0902557 Service Request:

Date Collected: NA Date Received: NA Date Extracted: NA Date Analyzed: 07/28/09

Laboratory Control Sample Summary **Inorganic Parameters** 

Laboratory Control Sample Sample Name:

Units: mg/L (ppm)

Lab Code:

P0902557-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0403	101	86-114	

Kau Rya Date: Approved By

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902557 **Date Collected:** 07/28/09

**Date Received:** 07/28/09

Date Extracted: NA

**Date Analyzed:** 07/28/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-17-4

Lab Code:

P0902557-001MS

P0902557-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0514	0.0504	103	101	80-120	2	

Karn Rya Date : \_\_\_\_



## CAS SR #P0902576

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## LABORATORY REPORT

July 30, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 29, 2009. For your reference, these analyses have been assigned our service request number P0902576.

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.

Cheloste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>23</u>



Client:

Battelle

CAS Project No:

P0902576

Project:

JPL GW Mon 3Q09 / G486090

## **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

## 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

MModified MethodMDLMethod Detection LimitMRLMethod 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 Billionppm Parts Per Million

PQL Practical Quantitation Limit
QA/QC Quality Assurance/Quality Control
RCRA Resource Conservation and Recovery Act

RPD Relative Percent Difference SIM Selected Ion Monitoring

SM Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846,

Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.

TDS Total Dissolved Solids
TPH Total Petroleum Hydrocarbons
TSS Total Suspended Solids

TTLC Total Threshold Limit Concentration

VOA Volatile Organic Analyte(s)
VOC Volatile Organic Compound(s)

## Qualifiers

U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

J The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.

B Analyte detected in the method blank above MRL (PQL).

E Estimated; result based on response which exceeded the instrument calibration range.

N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.

**D** The reported result is from a dilution.

X See case narrative.

Client: Battelle

Service Request: P0902576 **Project:** JPL GW Mon 3Q09/G486090

## SAMPLE CROSS-REFERENCE

SAMPLE #	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
P0902576-001	MW-23-4	7/29/09	07:34
P0902576-002	MW-23-3	7/29/09	07:58
P0902576-003	MW-23-2	7/29/09	08:18
P0902576-004	MW-23-1	7/29/09	08:46
P0902576-005	EB-7-7/29/09	7/29/09	08:32

## Page of

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

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

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

CAS Contact:	Preservative Key	0 None	1 HCL	2 HNO3	3 H2SO4	4 NaOH	5 Zn Acetate	6 Asc Acid	7 Other			Remarks	M5 /M52					Eguir Blank					
Analysis Method and/or Analytes	Preservative Code						99	»/ <i>L</i>		)	10												
Analysis			eq)			q) eqpc	TI (S	es Contraction	genate (Sub (Sub 1 801 1 801 2 GC	B = Oxy	80151 80151 80151 801 901 801 801	Volatile O 624 887 PPH Gas BTEX 807 TPH Dies TPH Dies TPH Dies Cemi-Volk 625 885 885 885 885 885 885 885 885 885 8	X		×	×							
		W 3009			2		BATTELLE	LOMPRINS 1	AVE 43.02			Number of Containers	7	7									V
Droiont Namo		JPL GW HWW	Project Number		1709877	200	214319 / 67	ATIN GERAND TOM	505  CAG	Į.		Time Matrix Collected	734 W	158	818	88		832					
T		_		_	7	) d	7	<u> </u>	<u> </u>	Sampler (Print & Sign)		Date Collected	7/28/2 7	7   ,	~	~		8					
opal paitage	Sill Sill Sill Sill Sill Sill Sill Sill	~ AVE	00 1	-			CONNER	Fax		oorting		Laboratory ID Number		2	$\bigvee$	7	- 1	7	\				
Company Name & Address (Boserting Information)	BATELE	1990 OW Town	CAN 3.67. 7 A 60.10	) (SEE >>>		Project Manager	S 0.48		1167-111-(217)	Email Address for Result Reporting		Client Sample ID	MW-23-4	MW-23-3	MW-23-2	MW-23-1		EB-7-1/19/5					

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902576

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed On
P0902576-001.01					
	7196A				
		7/29/09	1130	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	
P0902576-001.02				01.60 / 00.00 1.00	
		7/29/09	1131	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	
P0902576-002.01					
	7196A	7/29/09	1130	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	
P0902576-003.01					
1 0902370-003.01	7196A				
	717011	7/29/09	1130	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	
P0902576-004.01	, , , ) - 10 p 1 - 10 10 10 10 - 10 10 10 10 10 10 10 10 10 10 10 10 10				
	7196A				
		7/29/09	1130	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	
P0902576-005.01					
	7196A				
		7/29/09	1130	SMO / SSTAPLES	
		7/29/09	1131	P-37 / SSTAPLES	
		7/29/09	1201	In Lab / SANDERSON	
		7/29/09	1520	P-37 / SANDERSON	

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance	- Check Form	Work order:	P0902576			
Project:	JPL GW Mor	1 3Q09 / G486090			•					
Sample(s	s) received on	: 07/29/09			Date opened:	07/29/09	_ by:	SSTAI	PLES	
Note: This	form is used fo <u>r a</u>	ll samples received by CAS	. The use of this	form for custody	seals is strictly m	eant to indicate pres	sence/absence and r	not as an	indication	n of
compliance	or nonconformity	r. Thermal preservation and	pH will only be	evaluated either a	t the request of th	ne client and/or as re	quired by the meth	od/SOP. <u><b>Yes</b></u>	<u>No</u>	N/A
1	Were sample	containers properly n	narked with cl	ient sample II	)?			$\times$		
2	Container(s)	supplied by CAS?						$\boxtimes$		
3	Did sample o	containers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-		$\times$							
5	Was the chai	n-of-custody properly	completed?					$\boxtimes$		
6	Did sample o	container labels and/or	r tags agree wi	th custody pap	pers?			$\times$		
7	Was sample	volume received adequ	ate for analys	is?				$\times$		
8	Are samples	within specified holdin	g times?					$\times$		
9	Was proper to	emperature (thermal ;	reservation) o	of cooler at rec	eipt adhered t	o?		$\boxtimes$		
	(	Cooler Temperature	,	°C Blank	Γemperature	3	°C			
10		ank received?		•	-					$\boxtimes$
	-	supplied by CAS:					_			
11	Were custody	y seals on outside of co	ooler/Box?						$\times$	
	Location of	seal(s)?					_Sealing Lid?			$\overline{\times}$
	Were signar	ture and date included?	?				_			X
	Were seals	intact?								$\times$
	Were custody	seals on outside of sar	mple containe	r?					$\times$	
	Location of						Sealing Lid?			X
	Were signat	ture and date included?	)				_			X
	Were seals									X
12	Do containers	s have appropriate pre	servation, acc	ording to met	hod/SOP or C	lient specified in	formation?	X		
		ent indication that the s		_		-				X
		vials checked for prese	-							$\boxtimes$
	·	nt/method/SOP require			ample pH and	l if necessary al	ter it?			$\boxtimes$
13	Tubes:	Are the tubes cap	•		ampre pri and	i ii necessai y ai	ter it:			$\boxtimes$
15	Tubes.	Do they contain n	-	•						$\boxtimes$
14	Badges:	Are the badges p		d and intact?						$\boxtimes$
1.	Dauges.	Are dual bed bads			ly canned and	intact?				$\boxtimes$
					į vaidiniai ir ja					
Lab S	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		t / Pres lommer	ervation its	
P0902576	-001.01	125mL Plastic NP								
P0902576	-001.02	125mL Plastic NP								
P0902576		125mL Plastic NP								
P0902576		125mL Plastic NP								
P0902576 P0902576		125mL Plastic NP 125mL Plastic NP								
<del></del>			numbara).	<u> </u>	<u> </u>		<u> </u>			
Expiain ai	ny discrepancie	s: (include lab sample ID	numbers):							

<sup>\*</sup>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); CN (NaOH or NaOH or NaOH/Asc Acid) (pH>12); CN (NaOH or NaOH or NaO

## **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

## Analytical Report

Client: Battelle

Project Name: JPL GW Mon 3Q09

**Project Number:** G486090 **Sample Matrix:** WATER

Service Request: P0902576 Date Collected: 07/29/09

Date Received: 07/29/09

Chromium, Hexavalent

Prep Method: None Units: mg/L (ppm)

Analysis Method: 7196A Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-23-4	P0902576-001	0.010	0.003	1	NA	07/29/09 14:10	ND	
MW-23-3	P0902576-002	0.010	0.003	1	NA	07/29/09 14:10	ND	
MW-23-2	P0902576-003	0.010	0.003	1	NA	07/29/09 14:10	ND	
MW-23-1	P0902576-004	0.010	0.003	1	NA	07/29/09 14:10	ND	
EB-7-7/29/09	P0902576-005	0.010	0.003	1	NA	07/29/09 14:10	ND	
Method Blank	P0902576-MB	0.010	0.003	1	NA	07/29/09 14:10	ND	

Approved By Kall Ryp Date: 7/29/09 9

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902576

Date Analyzed: 07/29/09

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	0.003	ND
CCB1	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Koren Rya

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902576

Date Analyzed: 07/29/09

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	Acceptance Criteria
ICV	0.0579	0.0548	95	90-110
CCVI	0.0579	0.0559	97	90-110

An	proved	Bv:
$\iota$ $\iota$	proved	1 y .

CCV1A/120594

Kanu Pya Date: 7/29/09

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: Sample Matrix:

G486090 WATER

Service Request:

P0902576

07/29/09

**Date Collected:** 

NA NA

Date Received: Date Extracted: Date Analyzed:

NA

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name: Lab Code:

Laboratory Control Sample

P0902576-LCS

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS		
						Percent		
						Recovery		
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes	
Chromium, Hexavalent	None	7196A	0.0400	0.0387	97	86-114		

7/29/09 \_\_\_\_\_ Date : \_\_\_\_\_ Approved By

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902576

**Date Collected:** 07/29/09 **Date Received:** 07/29/09

Date Extracted: NA

Date Analyzed: 07/29/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-23-4

Lab Code:

P0902576-001MS

P0902576-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0488	0.0488	98	98	80-120	<1	

Karn Rya Date:



## CAS SR #P0902600

## **Table of Contents**

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Hexavalent Chromium Raw Data	 	17-26



## LABORATORY REPORT

July 31, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 30, 2009. For your reference, these analyses have been assigned our service request number P0902600.

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.

Sudertu

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of <u></u>



Client:

Battelle

CAS Project No:

P0902600

Project:

JPL GW Mon 3Q09 / G486090

## **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle

**Project:** JPL GW Mon 3Q09/G486090

## SAMPLE CROSS-REFERENCE

Service Request: P0902600

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902600-001	MW-24-4	7/30/09	07:45
P0902600-002	MW-24-3	7/30/09	08:10
P0902600-003	MW-24-2	7/30/09	08:45
P0902600-004	MW-24-1	7/30/09	09:24
P0902600-005	EB-8-7/30/09	7/30/09	09:10
P0902600-006	MW-11-3	7/30/09	11:05
P0902600-007	MW-11-2	7/30/09	11:26
P0902600-008	MW-11-1	7/30/09	11:49

## 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 Billionppm 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 - 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

COUNTS   C
Sect   Section   Chapter   The Gas   State   Section   Chapter   The Gas   State   Section   Chapter   Section   S
6540   8560   00xygenates   PH Gas
SCA   8560B   Ovygenates   TP  TPH FC   8015B   (Subconfracted)  TPH FC   8015B   (Subconfracted)  TPH FC   8015B   (Subconfracted)  Semi-Votatile Organics GC/MS  Semi-Votatile Organics GC/MS  Semi-Votatile Organics GC/MS  AN A STOC   (Subconfracted)  TPH FC   8015B   (Subconfr
The Gas 80058 — Wagenstee I The Hosel 80158 — C. The Hosel 80158 —
Styl
Begin House the
100 / VSD /
1 Jasp /
1 ASD 1
1 1 1 1 1 1 1 1

# Page of

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

2655 Park Center Drive, Suite A Simi Valley, California 93065

Columbia

Phone (805) 526-7161 Fax (805) 526-7270

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) 3 Preservative Key H2S04 HN03 NaOH Other Remarks LEVEL TO က 4 Ŋ 9 1 CAS Contact EDD required Yes / No Type: 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 Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J requiled Yes / No 8270C 🗆 (Subcontracted) Semi-Volatile Organics GC/MS TPH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B [] (Subcontracted) Volatile Organics GC/MS 
624 □ 8260B □ Oxygenates □ TPH Gas 214319 / BATTELLE ATTN. GE PAU TOMPUNS Number of Containers OH 4320 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) ASA P.O. # / Billing Information Lan 6486090 16126 Matrix 2 وبكالمتراساهك JPL GW Project Number Project Name Sampler (Print & Sign) 66/1 Date Time Collected Collected 503 9711 /s/ 765/29 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) 92110 Laboratory ID Number どろろの Email Address for Result Reporting 3 Tier 1 - (Results/Default\*)f not specified) Report Tier Levels - please select DIEGO, BATTELLE 1 Project Manager = DAVID Client Sample ID ニーダブ 986 (619 ころし SAN <u>∑</u>

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Temperature

Cooler / Blank / Ice / No Ice

Received b

ier II - (Results + 🛇

### Columbia Analytical Services, Inc. **Chain of Custody Report**

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902600

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0902600-001.01					
	7196A	7/20/00	1255	OMO / COTA DI EC	
		7/30/09 7/30/09	1355 1404	SMO / SSTAPLES P-37 / SSTAPLES	
		7/30/09	1404	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
P0902600-002.01					
	7196A				
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
P0902600-003.01					
	7196A	7/20/00	1255	CMO / CCTADI EC	
		7/30/09 7/30/09	1355 1404	SMO / SSTAPLES P-37 / SSTAPLES	
		7/30/09	1404	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
		7730709	1019	1-577 SANDERSON	
P0902600-003.02					
		7/30/09	1400	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
P0902600-004.01					
	7196A	<b>=</b> /2 0 /00	1055	GMO / GGTA DY TG	
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON P-37 / SANDERSON	
		7/30/09	1619	F-37/ SANDERSON	
P0902600-005.01					
	7196A	= 12.0 /0.0			
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
	340,240,000	7/30/09	1619	P-37 / SANDERSON	
P0902600-006.01					
	7196A				
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
P0902600-007.01					•
	7196A				•

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 3Q09/G486090

Service Request: P0902600

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed On
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	
P0902600-008.01					
	7196A				
		7/30/09	1355	SMO / SSTAPLES	
		7/30/09	1404	P-37 / SSTAPLES	
		7/30/09	1411	In Lab / SANDERSON	
		7/30/09	1619	P-37 / SANDERSON	

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance	- CHECK FOIL	Work order:	P0902600			
Project:	JPL GW Mon	3Q09 / G486090								
Sample(	s) received on:	07/30/09			Date opened:	07/30/09	_ by:	SSTAI	PLES	
		ll samples received by CAS							indication	ı of
compliance	or nonconformity	. Thermal preservation and	pH will only be	evaluated either a	t the request of the	ne client and/or as re	quired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	N/A
1	Were sample	containers properly i	narked with cl	ient samnle IT	12			$\boxtimes$		
2	•	supplied by CAS?	narked with er	iem sample il	· •			$\boxtimes$		
3	• • •	ontainers arrive in go	od condition?					$\boxtimes$		
4	-	of-custody provided?						$\overline{\times}$		
5		n-of-custody properly	completed?					$\boxtimes$		
6		ontainer labels and/o	-	th custody par	ners?			$\boxtimes$		
7	=	volume received adeq						$\boxtimes$		
8	-	within specified holding	·	13:				$\boxtimes$		
9	•	emperature (thermal)	-	of cooler at rec	eint adhered t	to?		$\boxtimes$		
9		• ` `	nescivation) (		Cipi adirered ( Femperature	3	°C		_	
10		Cooler Temperature		, C Blatik	i emperature	3				$\boxtimes$
10	_	ank received?							ш	7.
1.1	-	supplied by CAS:	a low/Dow?	<u> </u>			_		$\boxtimes$	
11	-	v seals on outside of co	JUICI/ DUX!				Cooling Lid?			$\boxtimes$
	Location of	* *					_Sealing Lid?			$\boxtimes$
	-	ure and date included	<i>:</i>							
	Were seals			0						$\boxtimes$
	•	seals on outside of sa	mple containe	r?			~		$\boxtimes$	
	Location of	* *					_Sealing Lid?			$\boxtimes$
	•	ure and date included	?							$\boxtimes$
	Were seals									$\boxtimes$
12		have appropriate pre		_		lient specified in	iformation?	$\times$		
	Is there a clie	ent indication that the	submitted samp	ples are <b>pH</b> p	reserved?					$\overline{\times}$
	Were <u>VOA v</u>	<u>rials</u> checked for prese	nce/absence o	f air bubbles?						$\times$
	Does the clie	nt/method/SOP requir	e that the analy	yst check the s	ample pH and	l if necessary al	ter it?			$\times$
13	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						$\boxtimes$
		Do they contain r	noisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\boxtimes$
	Ü	Are dual bed bad	ges separated a	ınd individuall	y capped and	intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	Recein	t / Pres	ervation	
LJHO)	mmpic 1D	Description	pH *	рН	pН	(Presence/Absence)		ommei		
P090260(	)-001.01	125mL Plastic NP								
P0902600		125mL Plastic NP								
P0902600		125mL Plastic NP								
P0902600		125mL Plastic NP								
P0902600		125mL Plastic NP								
P0902600		125mL Plastic NP		<u> </u>						
Explain a	ny discrepancies	s: (include lab sample ID	numbers):							

### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0902600	
Project: JPL GW Mon 3Q09 / G486090			
Sample(s) received on: 07/30/09	Date opened: 07/30/09	by:	SSTAPLES

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receipt / Preservation
	Description	р <b>Н</b> *	pН	pН	(Presence/Absence)	Comments
P0902600-007.01	125mL Plastic NP					
P0902600-008.01	125mL Plastic NP					
		***************************************		***************************************		
101111111111111111111111111111111111111						
***************************************						
moore						

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### Analytical Report

Client: Battelle

**Project Name:** JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix: WATER

Service Request: P0902600 Date Collected: 07/30/09

**Date Received:** 07/30/09

Chromium, Hexavalent

Prep Method: Units: mg/L (ppm) None Analysis Method: 7196A

Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-24-4	P0902600-001	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-24-3	P0902600-002	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-24-2	P0902600-003	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-24-1	P0902600-004	0.010	0.003	1	NA	07/30/09 15:15	ND	
EB-8-7/30/09	P0902600-005	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-11-3	P0902600-006	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-11-2	P0902600-007	0.010	0.003	1	NA	07/30/09 15:15	ND	
MW-11-1	P0902600-008	0.010	0.003	1	NA	07/30/09 15:15	ND	
Method Blank	P0902600-MB	0.010	0.003	1	NA	07/30/09 15:15	ND	

Kam Rya Date: 7/31/09

Report By:SAnderson

QA/QC Report

Client: Project: Battelle

JPL GW Mon 3Q09 / G486090

Service Request: P0902600

Date Analyzed: 07/30/09

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	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:

ICCBMDL/120594

\_\_\_\_\_ Date: \_\_\_\_\_**7/30/69** 

Karu Rya

QA/QC Report

Client:

Battelle

Project:

JPL GW Mon 3Q09 / G486090

Service Request: P0902600

Date Analyzed: 07/30/09

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	Acceptance Criteria
ICV	0.0579	0.0564	97	90-110
CCV1	0.0579	0.0564	97	90-110
CCV2	0.0579	0.0553	96	90-110

Approved By:

CCV1A/120594

\_\_\_\_\_Date: <u>7/30/09</u>

Kam Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: Sample Matrix:

G486090 WATER

Service Request:

P0902600

Date Collected:

NA

Date Received: Date Extracted:

NA NA

Date Analyzed: 07/30/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name: Lab Code:

Laboratory Control Sample

P0902600-LCS

Units:

mg/L (ppm)

Basis: NA

Test Notes:

CAS Percent Recovery Acceptance **Analysis** Prep Percent Result Limits Method Method True Value Result Recovery Notes Analyte None 7196A 0.0400 0.0408 102 86-114 Chromium, Hexavalent

Karu Rya Date:

Report By:SAnderson

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0902600

**Date Collected:** 07/30/09 **Date Received:** 07/30/09

Date Extracted: NA

Date Analyzed: 07/30/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-24-2

Lab Code:

P0902600-003MS

P0902600-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	-		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0512	0.0501	102	100	80-120	2	

Karr Rya Date: 7/31/09



### CAS SR #P0902614

### **Table of Contents**

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### LABORATORY REPORT

July 31, 2009

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

RE: JPL GW Mon 3Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 31, 2009. For your reference, these analyses have been assigned our service request number P0902614.

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

Page 1 of <u>25</u> 2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0902614

Project:

JPL GW Mon 3Q09 / G486090

### **CASE NARRATIVE**

The samples were received intact under chain of custody on July 31, 2009 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 3Q09/G486090

Service Request: P0902614

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0902614-001	MW-22-3	7/31/09	07:37
P0902614-002	MW-22-2	7/31/09	07:58
P0902614-003	MW-22-1	7/31/09	08:24
P0902614-004	EB-9-7/31/09	7/31/09	08:12

### 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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 Billionppm 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.