### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

**Project Number:** G486090

Sample Matrix:

WATER

Service Request: P0901679

Date Collected: 05/18/09

Date Received: 05/18/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

KHH 05/20/09 Date: Approved By



### CAS SR #P0901646

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### LABORATORY REPORT

June 9, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains \_/\$\frac{1}{2}\$ 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.

Juleske

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of \_/8/



Client:

Battelle

Project: JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901646

### **CASE NARRATIVE**

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

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

No anomalies were encountered during this analysis.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901646

### SAMPLE CROSS-REFERENCE

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

### Columbia Analytical Services, Inc.

### Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

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

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

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.

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

Company National Accordance to the State of Control of Course of C	vice Request Page / of /		CAS Contact:	Preservative Kev	0 None	1 HCL 2 HN03						Remarks				OR LESEL TIE		Eariphest Block				Project Requirements (MRLs, QAPP)		W Timp 12. 30	
Water & Soil - Chain of alley, California 93065 (1805) 526-730 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1805) 526-7161 (1806) 727 (1806) 727 (1806) 727 (1806) 727 (1806) 727 (1806) 727 (1806) 727 (1807)	ıstody Record & Analytical Ser		Analysis Method and/or Analytes	Preservative Code	00			racted) (Subcoted)	E 80218 Subcontracte CO/MS CONTracte Contracte CO/MS	MTB anics (Sub anics	20/26   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TPH Gas SEE 825		×	×	×	X	×					MDL YPOL / J required Yes / No		The state of the s
Park Center Drive, Salley, California 93(1805) 526-7161 (105) 526-7161 (105) 526-7161 (105) 526-7161 (105) 526-7161 (107) The III - (Data The	- Chain of	Requested Turnaround Time 1 Day (100%) 2 Day (75%) 3	ame		MON,	. 6		TO PARTIE TO THE TOTAL TOT	11 1 V VC.	1/25	.Baujca	Number of O	7			7	Ь	7						TM230	+
Analytical Services of Phon Services of Phon Services of Phon Fax (Services of Phon Fax (Services of Phon Fax (Services of Phon Fax (Services of Phone & Address (Report Text of Phone Email Address for Result Reporting Email Address for Result Reporting Email Address for Result Reporting Mw-4-5  Mw-4-5  Mw-4-7  Mw-4-7	≥ %	Phone (805) 526-7161 Fax (805) 526-7270			126	<u> </u>	ACTION OF THE PERSON NAMED	PO.#/B	705 705	Email Address for Result Reporting   Sampler (Print & Sic	West Talour Anna arma	I	8		5   0934	7001							Iler v - (client specified)	F.	11/ 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

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

Client	: Battelle					Work order:	P0901646			
Project	t: JPL GW Mor	n 2Q09 / G486090								
Sample	e(s) received on	: 05/14/09		-	Date opened	: 05/14/09	by:	SSTA	PLES	
Note: This	s form is used for a	ll samples received by CA	S. The use of this	form for custody	seals is strictly i	meant to indicate pre	sence/absence and	not as an	indicatio	n of
compliance	e or nonconformity	. Thermal preservation an	d pH will only be	evaluated either	at the request of	the client and/or as r	equired by the meth	- ·		N.I./A
1	Wors somels		manufund seriele a	Lant comula II	D0			<u>Yes</u> ⊠	$\frac{No}{\Box}$	<u>N/A</u>
1	-	containers properly	marked with c	nent sample n	J?					
2	` '	supplied by CAS?	1 11.1 0					$\boxtimes$		
3	_	containers arrive in go						$\boxtimes$		
4		of-custody provided?						$\boxtimes$		
5	Was the chair	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/o	or tags agree w	ith custody pa	pers?			X		
7	Was sample	volume received adeq	uate for analys	sis?				$\times$		
8	Are samples v	within specified holdi	ng times?					X		
9	Was proper to	emperature (thermal	preservation)	of cooler at re	ceipt adhered	to?		$\times$		
	C	Cooler Temperature		°C Blank	Temperature	4	°C			
10	Was a trip bl	ank received?	***************************************	•	•				X	
		supplied by CAS:								
11	-	seals on outside of c	ooler/Box?		**************************************				$\times$	
	Location of						Sealing Lid?			X
		ure and date included	?							$\boxtimes$
	Were seals i		•							$\boxtimes$
		seals on outside of sa	mple containe	r?					$\boxtimes$	
	Location of		impre containe	•			Sealing Lid?			×
		ure and date included	?		\		_ Southing Entit.			$\boxtimes$
	Were seals i		•							X
12		have appropriate pre	scarnation acc	cording to met	had/SOP or C	lient specified in	formation?	$\boxtimes$		
12			•	_		man specified in	normation:			
		nt indication that the			reserveu?					$\boxtimes$
		ials checked for prese								$\boxtimes$
		nt/method/SOP requir			ample pH and	d if necessary al	ter it?			X
13	Tubes:	Are the tubes cap	ped and intact	?						$\boxtimes$
		Do they contain r	noisture?							$\boxtimes$
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\times$
		Are dual bed bad	ges separated a	and individual	ly capped and	l intact?				$\boxtimes$
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	/ Pres	ervation	
		Description	pH.*	pН	pН	(Presence/Absence)		ommer		
P090164	6-001-01	125mL Plastic NP								
P090164		125mL Plastic NP						*******	W	
P0901640		125mL Plastic NP								
P0901646		125mL Plastic NP								
P0901640		1000ml AG NP								
P0901646	6-005.02	1000ml AG NP						Programme of the Alphana		
Explain a	any discrepancies	: (include lab sample ID	numbers):					-		
										–

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

Client: Battelle	Work order:	P0901646	
Project: JPL GW Mon 2Q09 / G486090			,
Sample(s) received on: 05/14/09	Date opened: 05/14/09	by:	SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	
P0901646-005.03	125mL Plastic NP					
P0901646-005.04	500mL AG NP					
P0901646-006.01	125mL Plastic NP					
**************************************						
4.4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1						
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	44		***************************************			

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

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

1,4 – Dioxane

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS Page 1 of 1

Client:

Battelle

Client Project ID: JPL GW Mon 2Q09 / G486090

CAS Project ID: P0901646

1,4-Dioxane

Test Code:

EPA 8270C SIM Modified

Instrument ID:

HP5971A/HP5890 II/MS1

Analyst: Matrix:

Test Notes:

Hani Cherazaie

Water

Date(s) Collected: 5/14/09

Date Received: 5/14/09

Date Extracted: 5/20/09

Date Analyzed: 5/21/09

Final Extract Volume:

1.0 ml(s)

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

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901646

Date Collected: 05/14/09

Date Received: 05/14/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

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-4-5	P0901646-001	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-4	P0901646-002	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-3	P0901646-003	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-2	P0901646-004	0.010	0.003	1	NA	05/14/09 15:40	ND	
MW-4-1	P0901646-005	0.010	0.003	1	NA	05/14/09 15:40	ND	
EB-14-5/14/09	P0901646-006	0.010	0.003	1	NA	05/14/09 15:40	ND	
Method Blank	P0901646-MB	0.010	0.003	1	NA	05/14/09 15:40	ND	

Karu Rya

Date:

## DIVIDER SHEET CAS-KELSO REPORT



May 26, 2009

Analytical Report for Service Request No: P0901646

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

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Les Kennedy

Project Chemist

LK/rh

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### Acronyms

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a

substance allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

POL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

### Inorganic Data Qualifiers

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

### Metals Data Qualifiers

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

### Organic Data Qualifiers

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

### Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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







### COLUMBIA ANALYTICAL SERVICES, INC.

Client:

Battelle

Project:

JPL GW Mon 2Q09

Sample Matrix:

Water

Service Request No.:

P0901646

Date Received:

5/14/09

### CASE NARRATIVE

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

### Sample Receipt

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

### Nitrosamines by EPA Method 521

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

Approved	bv	U	Date	5/w/	09
-1-X		······································		7	

### 80

# Intra-Network Chain of Custody

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

Project Name: Project Number: G486090 JPL GW Mon 2Q09

Project Manager: David Conner Battelle

P0901646-005

MW-4-1

Lab Code

Client Sample ID

# of Cont. Matrix Water 5/14/09 Date Sample 1043 Time Date Received 5/14/09 KELSO Send To Nitrosamines 521 Ш

Test Comments

Nitrosamines - 521

P0901646-005

NDMA

6

Folder Comments:

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

					Special Instructions/Comments
Requested Report Date: 05/31/09	Requested FAX Date:	* STANDARD	PLEASE CIRCLE WORK DAYS  1 2 3 4 5	RUSH (Surcharges Apply)	Turnaround Requirements
EDD Y	PQL/MDL/J <u>Y</u>	IV. Data Validation Report with Raw Data	III. Results + OC and Calibration Summaries	I. Results Only	Report Requirements
	Bill to		PO# P0901646		Invoice Information

Relinquished By:

14:10

Received By. Kills Shirk 5/5/09 /1000 Airbill Number.

Page !

### Columbia Analytical Services, Inc. Cooler Receipt and Preservation Form

PC LES

Client / Project: Simi		-		auon Form vice Request &	100 P	79016416	,	
Received: 5 - 15 - 09	Opened:					Samuel and the second	714.11	***************************************
1. Samples were received via?	-	ور دور	PS, DHL		PDX	Courier 1	Hand Del	livered
Samples were received in: (circle)		Box	Envelope	Other		O O O O O O O O O O O O O O O O O O O	NA	ar cy car
3. Were <u>custody seals</u> on coolers?	NA	Y (N)	•					
If present, were custody seals in	tact?	Y N	If pr	esent, were they	signed and	dated?	Y	N
4. Is shipper's air-bill filed? If not	, record air-bill nu	ımber: <u>[Z</u>	18905	43414860	063-	NA	(3)	И
5. Temperature of cooler(s) upon	receipt (°C):	Щ.						in we hands to blanch to the first own comments or
Temperature Blank (°C): Thermometer ID:		- <del>S</del>	73			Market Strand Land		MALLEN .
6. If applicable, list Chain of Custo	dy Numbers:					***************************************		
7. Packing material used. Inserts	s Baggies Bu	bble Wrap	(Gel Packs	Wet Top Sleeve	s Other_			
8. Were custody papers properly fi	lled out (ink, sign	ed, etc.)?				NA	$\mathcal{C}$	N
9. Did all bottles arrive in good co	ondition (unbrok	en)? India	ate in the tab	e below.		NA	8	N
10. Were all sample labels complete	e (i.e analysis, pre	servation, e	tc.)?			NA	<b>1</b>	N
11. Did all sample labels and tags a	gree with custody	papers? In	dicate in the to	ible below		NA	3	N
12. Were appropriate bottles/cont	ainers and volun	nes receive	l for the tests	indicated?		NA	T	N
13. Were the pH-preserved bottles to	ested* received at	the appropr	riate pH? Indi	cate in the table	below	CNA	Y	N
14. Were VOA vials received witho	-					9	Y	N
15. Are CWA Microbiology sample	les received with	>1/2 the 24	hr, hold time	remaining fron	collection	1? XA	Y	N
16. Was C12/Res negative?						NA)	Y	N
Sample ID on Bottle	Sample ID o	n COC	Sa	mple ID on Bottle		Sample ID o	on COC	
								~~~
	Bottle Count	Out of Hea	d-		Volume	Reagent Lot		
Sample ID	Bottle Type		ce Broke ph	Reagent	added	Number	Initials	Time
		-						
		-				,		
*Does not include all pH preserved sample ali			g SOP (SMO-GE	J).				
Additional Notes, Discrepancies,	& Kesolutions:_							

7

### Organic Analysis: Nitrosamines by EPA 521

Summary Package

Sample and QC Results

### COLUMBIA ANALYTICAL SERVICES, INC.

Client: Project: Battelle

JPL GW Mon 2Q09/G486090

Service Request:

P0901646

Cover Page - Organic Analysis Data Package Nitrosamines by EPA 521

 Sample Name
 Lab Code
 Date Collected
 Date Received

 MW-4-1
 P0901646-005
 05/14/2009
 05/14/2009

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

Signature: 10m & Portroy Name: hoven fort

Date: 5/12/09 Title: Supervisor

Cover Page - Organic

9

Page 1 of

SuperSet Reference:

RR101923

### COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Battelle

Project: Sample Matrix: JPL GW Mon 2Q09/G486090

Water

Service Request: P0901646

Date Collected: 05/14/2009

Date Received: 05/14/2009

Nitrosamines by EPA 521

Sample Name:

MW-4-1

Lab Code:

P0901646-005

Units: ng/L Basis: NA

**Extraction Method:** 

**METHOD** 

Level: Low

Analysis Method:

521

Analyte Name

Result Q

MRL MDL Dilution Factor

Date Date Extracted Analyzed Extraction

Note

N-Nitrosodimethylamine

0.74 J

2.0

0.54

05/15/09

05/16/09

Lot KWG0904110

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

Comments:

Printed: 05/18/2009 15:30:08 u:\Stealth\Crystal.rpt\Form1m.rpt

Form 1A - Organic

SuperSet Reference:

Page RR101923

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### CAS SR #P0901627

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Hexavalent Chromium Raw Data	15-24



### LABORATORY REPORT

May 14, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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,

Sue Quelles

Sue Anderson Project Manager

Page 1 of *25* 

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901627

Project:

JPL GW Mon 2Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901627

### SAMPLE CROSS-REFERENCE

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

### 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 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

155 Total Suspended Sonds

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 1 of 1

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

Columbia Analytical	2655 Park Center Drive, Suite A	Water & John - Challi Drive, Suite A	Š	5	nionau decon	י. פר		₹ 8	a Allalylical Service	<u>ğ</u>	<u> </u>		Isanbau	Page	of
An Employee - Owned Company	Phone (805) 526-7161 Fax (805) 526-7270		Requested Turnaround Tim 1 Day (100%) 2 Day (75%)	naround Ti 2 Day (75%	round Time in Business Days (Surcharges) please circle Jay (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day	iness Da 0%) 4 D	ay (35%)	<b>harges</b> 5 Day	s Days (Surcharges) please circle 4 Day (35%) 5 Day (25%) 10 Day		- Standard		SA)	GAS Project No	
any Name & Address	Company Name & Address (Reporting Information)	Project Name					Analysi	s Metho	Analysis Method and/or Analytes	Analytes			CAS	CAS Contact:	
BATTELLE	,	(		·					1 % 1	Code				ă.	Preservative Key
3990 OLD TOWN	OLD TOWN AVE, C-205	Project Number		180H		()	1	o a	0	1	1			• • Т	None
SAN DIELO, CA 92110	92110	0609845	, 5 <b>0</b>		s	ntractec								- 0 0	HNO3
Project Manager	ER	P.O. # / Billing Information 2/43/9/8677ELLE	Information STELLE	7.76		oodu8) 🗆		(0	(	*.··· 1111-1					H2SO4 NaOH Zn Acetate
Phone 619-726-7311	Fax	SPET KING AVE.	10 10 10 10 10 10 10 10 10 10 10 10 10 1		⊖ 8051E	B 8015B	SW/DD S	(961	0-50						Asc Acid Other
Email Address for Result Reporting		(Print & Sign)			18 □ OXy 1015B □ 1017 □ OXy	1 8012M (S		) 3~0 L) I	97) V	***************************************					
Client Sample ID	Laboratory Date ID Number Collected	Time Collected	Matrix	Number of Containers	TPH Gas 8 BTEX 8021		Semi-Volati	XUILL IN	WCN				***************************************		Remarks
MW-23-5	1/3/69	5/80	3	7				×		_					
Mw-23-4	,1 2	2480		И										ME	(1/3)
MW-23-3	3	450		1			X							† 	
Mw-23-2	4	hooi					×								
-23-1	5	104/					$\times$							36	18. TU
-13-05/13/	69 6	1,023		=1			×							Qui	QUIPHENT BLANK
	•														
						+	$\downarrow$	+		+	‡	<b>†</b>			
Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + Q@)		Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	kage) 10% Su	rcharge	MBL	MRL required Yes / No MDL / BOL / J required	MRL required Yes / No MDL / POL / J required Yes / No	oN/s	EDD 1	EDD required Yes / No	Yes / No		Proje	ct Requireme	Project Requirements (MRLs, QAPP)
Relinquished by: (Signature)		Person 10/0	1	Received be Signature		Ţ	11001				1/0	7 ime: / 7		-	
Relinquished Signature) ( 0 )	LAYAR.		1100 in	Section of Signature (Si	(Institute)	J.	3		The second second	of the Control of the	7	20 Call	, [ 2 ) [호	Cooler / Blank / Ice / No Ice	e / No Ice
Relinquished-by-(Signature)		Date:		Received by: (Signature)	gnature)		1200			Date	12/2/	Time:	\		!

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

Client: Project: Battelle

JPL GW Mon 2Q09/G486090

Service Request: P0901627

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed On
P0901627-001.01					
	7196A	-1100		a	
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321 1331	P-37 / SSTAPLES	
		5/13/09 5/13/09	1617	In Lab / SANDERSON P-37 / SANDERSON	
		3/13/09	1017	1-37/ SANDERSON	
P0901627-002.01					
	7196A	5/12/00	1200	GMO / COTADLEC	
		5/13/09	1320 1321	SMO / SSTAPLES P-37 / SSTAPLES	
		5/13/09 5/13/09	1321	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-002.02		5/13/09	1321	SMO / SSTAPLES	
		5/13/09	1321	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
		3/13/09	1017	F-377 SANDERSON	
P0901627-003.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
	na year andre dingle - A. J Malay M A district on the Control of the Contro	5/13/09	1617	P-37 / SANDERSON	
P0901627-004.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
20901627-005.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	
P0901627-006.01					
	7196A				
		5/13/09	1320	SMO / SSTAPLES	
		5/13/09	1321	P-37 / SSTAPLES	
		5/13/09	1331	In Lab / SANDERSON	
		5/13/09	1617	P-37 / SANDERSON	

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

Client: Battelle Work order: P0901627			
Project: JPL GW Mon 2Q09 / G486090			
	STAPL		
Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not		lication	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		<u>No</u>	N/A
	$\times$		
3 Did sample containers arrive in good condition?			
4 Was a <b>chain-of-custody</b> provided?			
• •			
6 Did sample container labels and/or tags agree with custody papers?	X		
7 Was sample volume received adequate for analysis?	X		
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:			
Were custody seals on outside of cooler/Box?		X	
Location of seal(s)? Sealing Lid?			$\boxtimes$
Were signature and date included?			$\boxtimes$
Were seals intact?			$\times$
•		$\overline{\mathbf{X}}$	
· ·			$\times$
· · · · · · · · · · · · · · · · · · ·			X
			X
			$\times$
Were <u>VOA vials</u> checked for presence/absence of air bubbles?			$\times$
A			$\times$
13 <b>Tubes:</b> Are the tubes capped and intact?			$\times$
Do they contain moisture?			$\times$
14 <b>Badges:</b> Are the badges properly capped and intact?			$\times$
Are dual bed badges separated and individually capped and intact?			$\boxtimes$
Lab Sample ID Container Required Received Adjusted VOA Headspace Receipt /	Preserv	ation	
Description pH pH pH (Presence/Absence) Con	mments		
P0901627-001.01   125mL Plastic NP			
P0901627-002.01 125mL Plastic NP			
P0901627-002.02 125mL Plastic NP			
P0901627-003.01   125mL Plastic NP   P0901627-004.01   125mL P0901627-0			
20901027-004 01 1725mL Plastic NP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
P0901627-004.01   125mL Plastic NP			

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

Client: Battelle	•	Work order:	P0901627	
Project: JPL GW Mon 2Q09 / G486090		_		
Sample(s) received on: 05/13/09		Date opened: 05/13/09	by:	SSTAPLES

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0901627-006.01	125mL Plastic NP					
			***************************************			And the second s
			,			
		······································				
		•				
		·				
	******					
**						
	***************************************					

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

### **DIVIDER SHEET**

### ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090

Sample Matrix:

WATER

Service Request: P0901627

**Date Collected:** 05/13/09

Date Received: 05/13/09

Chromium, Hexavalent

Prep Method:

Test Notes:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

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

Karu Rya Date: 5/14/07



### CAS SR #P0901610

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Hexavalent Chromium Analytical Data	9-14
Hexavalent Chromium Raw Data.	15-25



# LABORATORY REPORT

May 13, 2009

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

**RE: JPL GW Mon 2Q09 / G486090** 

Dear David:

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

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains **\_25** pages.

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of <u>25</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client: Project:

Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901610

# **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901610

# SAMPLE CROSS-REFERENCE

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

# 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

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

Columbia Analytical

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

Zn Acetate Asc Acid GUIPHENT BLANK Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Other OC LEVER II 검 CAS Project No. Remarks Cooler / Blank / Ice / No Ice MS/MSD က 2 Temperature \_\_\_ CAS Contact Strolos Tingus Date: Time: ON 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 0 J required Yes / No 0 X X X X X Required Yes / No 8270C (Subcontracted) SM\DB soinganile Organics GC\MS TPH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B 

(Subcontracted) MRL ПРН Gas 8015В П ВТЕХ 8021В П Received by: (Signature) Received by: (Signature) □ Setenates □ B260B P.O. # / Billing Information\_ 2/43/9/ BD/TELLE ATTV: GERALD TOMP/AINS 5-05 KING PUE. Received Av. Si Number of Containers SPL GW MON 2QA ot 7370 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) 4 06098+9 Matrix sumbus, 3 Project Number Project Name Sampler (Print & Sign) Date Time Collected Collected 137 51,2/09 0837 9701 100 411 Date: 3990 OLD TOWN ME, C-205 Company Name & Address (Reporting Information) Laboratory ID Number 0 **@** SAN DIEGO, CA 92110 Email Address for Result Reporting Fier 1 - (Results/Default if not specified) DAVID CONNET Report Tier Levels - please select 118-726-1311 An Employee - Owned Company Relinquish (Signature) Relinquished by: (Signature) Fier II - (Résults + QC) BATTELLE Project Manager 13-12-05 Client Sample ID MW-11-3 MW-11-5 MW-11-2 11-MM -11-MM

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 2Q09/G486090

Service Request: P0901610

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901610-001.01					
	7196A	5/10/00	1255	CMO /MTAMORA	
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09 5/12/09	1406 1601	In Lab / SANDERSON P-37 / SANDERSON	
		3/12/07	1001		
P0901610-002.01	7196A				
	/190A	5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
D0001610 002 02					
P0901610-002.02		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
D0001610 002 01	· · · · · · · · · · · · · · · · · · ·				
P0901610-003.01	7196A				
	1170/1	5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-004.01		***************************************			
1 0901010-004.01	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-005.01					
. 0,01010 005,01	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	
P0901610-006.01	,				
1 0,01010-000.01	7196A				
		5/12/09	1355	SMO / MZAMORA	
		5/12/09	1356	P-37 / MZAMORA	
		5/12/09	1406	In Lab / SANDERSON	
		5/12/09	1601	P-37 / SANDERSON	

# Columbia Analytical Services, Inc.

Client	Battelle		Sampl	le Acceptance	Check Form	ı Work order:	P0901610			
		2Q09 / G486090			•	Work order.	10701010		<del></del>	
	s) received on:			<del> </del>	Date opened:	05/12/09	by:	MZAN	1ORA	
- `	•	I samples received by CAS	. The use of this	•	•		_ `			n of
		Thermal preservation and								
-								<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?						X		
3	Did sample co	ontainers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-o	of-custody provided?						$\times$		
5	Was the chair	ı-of-custody properly	completed?					$\times$		
6	Did sample co	ontainer labels and/or	r tags agree wi	ith custody par	ers?			$\times$		
7	•	olume received adequ						$\times$		
8	-	vithin specified holdin	-					$\times$		
9	-	mperature (thermal p	_	of cooler at rec	eint adhered t	to?		$\times$		
,		ooler Temperature	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Γemperature	3	°C		_	
10	Was a trip bla	*		, C Dialik	i emperature		- ~		$\boxtimes$	
10	-	upplied by CAS:						_	Limin	
11	-	seals on outside of co	ooler/Box?				-		$\times$	
	Location of						Sealing Lid?			$\boxtimes$
		ure and date included?	)							$\boxtimes$
	Were seals i									X
		seals on outside of sa	mnle containe	r?					$\boxtimes$	
	Location of		impre containe	•			Sealing Lid?			$\boxtimes$
		are and date included:	)				_ Scaring Litt:			$\boxtimes$
	Were seals i									$\boxtimes$
10				andina to mot	had/COD an C	liant an acified in	farmation?			
12		have appropriate pre	•	•		ment specified in	iormanon?	$\boxtimes$		
		nt indication that the s	-		reservea?					$\boxtimes$
	Were <u>VOA v</u>	ials checked for prese	nce/absence of	f air bubbles?						X
	Does the clien	nt/method/SOP require	e that the analy	yst check the s	ample pH and	d if necessary al	ter it?			$\times$
13	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						$\times$
		Do they contain n	noisture?							$\times$
14	Badges:	Are the badges p	roperly capped	d and intact?						$\boxtimes$
		Are dual bed badg	ges separated a	ınd individual	y capped and	intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	1
		Description	р <b>Н</b> *	pН	pН	(Presence/Absence)		'ommer		
P0901610	)-001.01	125mL Plastic NP								
P0901610		125mL Plastic NP								
P0901610		125mL Plastic NP								
P0901610		125mL Plastic NP								
P0901610		125mL Plastic NP								
20901610		125mL Plastic NP								
Explain as	ny discrepancies	: (include lab sample ID	numbers):							

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0901610	
Project: JPL GW Mon 2Q09 / G486090			
Sample(s) received on: 05/12/09	Date opened: 05/12/09	by:	MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	
P0901610-006.01	125mL Plastic NP					
						.,
					1	
A						
,						
					****	
						**************************************
					- Mileton - Marine In the Vision	
						44 (10.00)

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090

Sample Matrix: WATER

Service Request: P0901610

**Date Collected:** 05/12/09

Date Received: 05/12/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Karu Rya

Date: 5/12/09



# CAS SR #P0901578

# **Table of Contents**

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Chain of Custody	5
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Hexavalent Chromium Analytical Data	9-14
Hexavalent Chromium Raw Data.	15-25



### LABORATORY REPORT

May 12, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

Judesse

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:

P0901578

Project:

JPL GW Mon 2Q09 / G486090

# **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle Service Request: P0901578

Project: JPL GW Mon 2Q09/G486090

# SAMPLE CROSS-REFERENCE

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

# 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.

# Page / of

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

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

Columbia Analytical

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

Zn Acetate Canipuin BANK Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key HN03 NaOH OC TENET IN 덮 Remarks DUPLICATE CAS Project No. N က 4 S 9 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 Damper Analysis Method and/or Analytes Preservative Code 0 J reguired Yes / No 0 X MRIL required Yes / No MDIL / PQL / J required 8270C □ (Subcontracted) SM/OB colatile Organics GC/MS TPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B [ (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ 8260B 🗆 Oxygenates 🗆 CC/MS RAG Number of Containers ATIVI CEPTAND TOMPKIND 505 KING DUE. corumans, of 4320, Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) \_\_\_\_\_ 6486090 P.O. # / Billing Information 214319 / BATTELLE Matrix ンン (ール Project Number Project Name Sampler (Print & Sign) Time Collected 827 125 1011 0913 7101 171 Shel Date Collected 60/ Company Name & Address (Reporting Information) 3990 OLD TOWN AVE, C-205 55N DIETO, CA 921/0 **Email Address for Result Reporting** Fier 1 - (Results/Default if not specified) TOWN CONNET 90/ Report Tier Levels - please select DUPE-08-2009 118-726-7311 An Employee - Owned Company Relinquished by (Signature) 7 Fier II - (Results ⊀∕ØC) MW-19-5 SATTELLE" Project Manager 4-19-4 MW-19-3 Mw-19-2 Client Sample ID 1-61-MM 53-11 Phone

ပွ

Temperature

Cooler / Blank / Ice / No Ice

Time:\

Date

Received by: (Signature)

Refinquisher (Signature)

Relinquished by (Signature)

# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901578

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
20901578-001.01					
	7196A	5/11/00	1.40.4	CMO / CCTADLEC	
		5/11/09	1404	SMO / SSTAPLES P-37 / SSTAPLES	
		5/11/09	1413		
		5/11/09 5/11/09	1456 1747	In Lab / SANDERSON P-37 / SANDERSON	
		3/11/09	1/4/	F-31/ SANDERSON	
20901578-002.01					
	7196A	5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1404	P-37 / SSTAPLES	
		5/11/09	1413	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
		3/11/05		1 J / DINIDING	
20901578-003.01	7196A				
	/190A	5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
20901578-004.01	7196A				
	/190A	5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
P0901578-005.01	71064				
	7196A	5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1413	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
0001570 005 01					
20901578-006.01	7196A				
	1170/1	5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	
20001579 007 01					
20901578-007.01	7196A				
		5/11/09	1404	SMO / SSTAPLES	
		5/11/09	1413	P-37 / SSTAPLES	
		5/11/09	1456	In Lab / SANDERSON	
		5/11/09	1747	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

			Samp	le Acceptance	Check Forn					
	Battelle	2000 / 210 (000			-	Work order:	P0901578			
		2Q09 / G486090			D-4	05/11/00	7	COTAT	T EC	
	s) received on:			-	Date opened:		- by:	SSTAI		
		l samples received by CAS		· ·	-	_			indication	n of
compilance	or nonconformity.	Thermal preservation and	ph will only be	evaluated either a	t the request of t	ne chent and/or as rec	quired by the meth	Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly r	narked with cl	lient sample II	)?			$\boxtimes$		
2	-	supplied by CAS?		itorit sumpre 12	•			$\boxtimes$		
	` ^	ontainers arrive in go	od condition?					$\boxtimes$		
4	_	of-custody provided?						$\boxtimes$		
5		<b>i-of-custody</b> properly	completed?					$\boxtimes$		
		ontainer labels and/or	*	ith custody par	ners?			$\boxtimes$		
7	_	olume received adequ						$\boxtimes$		
8	_	vithin specified holding	-					$\boxtimes$		
9	-	mperature (thermal )	-	of cooler at rec	eint adhered	to?		$\boxtimes$		
		ooler Temperature	or coor various		Γemperature	4	°C			
10	Was a trip bla	•		- Diunk	comporatare	•	- ~		X	
10	-	upplied by CAS:						Resour.		_
11	-	seals on outside of co	noler/Box?				_		$\boxtimes$	
••	Location of		,0101,20,11				Sealing Lid?			$\boxtimes$
		ure and date included:	)				_ zeumg ziu.			$\boxtimes$
	Were seals i									$\boxtimes$
		seals on outside of sa	mnle containe	r?					×	
	Location of		inpro containe				Sealing Lid?			$\boxtimes$
		are and date included:	)				_Seaming Liu:			$\boxtimes$
	Were seals i									$\boxtimes$
12		have appropriate <b>pre</b>	correction acc	pording to met	hod/SOP or C	lient specified in	formation?	$\boxtimes$		
12		nave appropriate prent indication that the s		· ·		ment specified in	iormanon;			$\boxtimes$
		ials checked for prese			reserveu:					
							1.0			$\boxtimes$
1.0		nt/method/SOP require			ample pH and	1 if necessary all	er it?			X
13	Tubes:	Are the tubes cap	-	!						$\boxtimes$
		Do they contain n								$\boxtimes$
14	Badges:	Are the badges p								$\boxtimes$
		Are dual bed badş	ges separated a	and individuall	y capped and	intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	
		Description	pH*	pН	pН	(Presence/Absence)	(	ommer	its	
P0901578	-001.01	125mL Plastic NP								
20901578		125mL Plastic NP								
P0901578	·····	125mL Plastic NP								
20901578		125mL Plastic NP								
20901578 20901578		125mL Plastic NP 125mL Plastic NP								
	<del></del>	: (include lab sample ID	numbara).							
LAPIGHI GL	ir discrepatioles	, andiuge fact sample ID	municois).							

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0901578	
Project: JPL GW Mon 2Q09 / G486090			-
Sample(s) received on: 05/11/09	Date opened: 05/11/09	by:	SSTAPLES

	en an en en en en en Broken en en en en Broken	Required	Received	Adjusted	VOA Headspace	
	Description	pH *	pН	рH	(Presence/Absence)	Comments
P0901578-007.01	125mL Plastic NP					
		<del></del>				
			,			
					;	
-2						

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090

Sample Matrix:

WATER

Service Request: P0901578

**Date Collected:** 05/11/09

Date Received: 05/11/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Karu Rya Date: 5/12/09 10

Report By:SAnderson



# CAS SR #P0901551

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Hexavalent Chromium Raw Data	15-25



### LABORATORY REPORT

May 11, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains **\_\_25**pages.

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

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

Juleste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of 25

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901551

Project:

JPL GW Mon 2Q09 / G486090

## **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901551

# SAMPLE CROSS-REFERENCE

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

# 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

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).

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

2655 Park Center Drive, Suite A

Columbia Analytical Services Mc.

4n Employee - Owned Company

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

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 EQUIPMENT BLANK Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Other A DUPLICATE Remarks ac rever Cooler / Blank / Ice / No Ice CAS Contact Temperature 104 Times 00 7 (2) Time: (-) EDD required Yes / No Type: Analysis Method and/or Analytes 0 0 POL / J required Yes / No tagence 0 人 χ. X X Х MRL required Yes / No MDL //PQL\_/ J required Semi-Volatile Organics GC/MS TPH FC [ 8015M (Subcontracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B (Subcontracted) TPH Gas 8015B□ BTEX 8021B□ M Received by: (Signature) Received by: (Signature) Volatile Organics GC/MS 624 □ 8260B □ Oxygenates □ TPH Gas □ ATA: GETLAND TOMPKINS 505 KING AVE. 2009 Number of Containers countries, off 43201 Tier III - (Data Validation Package) 10% Surcharge 6486090 P.O. #/ Billing Information 214319/ BOTTELLE GW MON. Jime: Matrix Project Number Project Name Sampler (Print & Sign) Time Collected 0835 1035 0360 105 ) *P*( 101 1060 Date Collected 108 Company Name & Address (Reporting Information) 7/97 3990 OLD TOWN AVE, 6-205 Laboratory ID Number SAN DIEGO, CA 92110 (1) (M) **30** Email Address for Result Reporting Fier 1 - (Results/Default if not specified) DAVID CONNER 23-10-5/07/09 Report Tier Levels - please select Dupe-07-2009 69-726-7311 Relinquished by: (Signature Ter II - (Plesults + QC) AW-12-3 MW-12-2 ユーガーダと MW-17-4 MW-12-5 Project Manager Client Sample ID

# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901551

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed Or
P0901551-001.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	······································
P0901551-002.01					
	7196A	5 /F /0.0			
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-003.01					
	7196A	5/7/00	1211	CMO / MZAMODA	
		5/7/09 5/7/09	1311 1311	SMO / MZAMORA P-37 / MZAMORA	
		5/7/09 5/7/09	1311	In Lab / SANDERSON	
		5/7/09 5/7/09	1510	P-37 / SANDERSON	
			1542	1-377 BANDERSON	
P0901551-004.01	71064				
	7196A	5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
00001551 005 01					
P0901551-005.01	7196A				
	717011	5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-006.01					
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	
P0901551-007.01					
	7196A				
		5/7/09	1311	SMO / MZAMORA	
		5/7/09	1311	P-37 / MZAMORA	
		5/7/09	1316	In Lab / SANDERSON	
		5/7/09	1542	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance	Check Form	Work order:	P0901551			
	~ <del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	2Q09 / G486090			•					
	s) received on:		****		Date opened:	05/07/09	by:	MZAN	1ORA	
• •		l samples received by CAS	. The use of this	•	•		- '			n of
compliance	or nonconformity	. Thermal preservation and	l pH will only be	evaluated either a	t the request of the	he client and/or as rec	quired by the meth	nod/SOP. <u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly r	narked with cl	ient sample ID	)?			$\boxtimes$		
2	-	supplied by CAS?		•				$\times$		
3		ontainers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-	of-custody provided?						$\times$		
5		n-of-custody properly	completed?					X		
6		ontainer labels and/o	-	th custody par	ers?			X		
7	-	olume received adeq						X		
8	-	vithin specified holding	•					X		
9	~	emperature (thermal )	_	of cooler at rec	eint adhered :	to?		X		
,		Cooler Temperature	preservation) c		Cemperature	3	°C	لضنا	hound	
10		ank received?	***************************************	. C Diank	cinperature		-		X	
10	_	upplied by CAS:							اجا	
11	•	seals on outside of co	ooler/Box?				•		$\boxtimes$	
11	Location of		JOICE/DOX.				Sealing Lid?			$\boxtimes$
		` '	)	,			_ Scaring Liu:			$\boxtimes$
	_	ure and date included	<u>'</u>							$\boxtimes$
	Were seals i			0						
	•	seals on outside of sa	mpie containe	r <i>!</i>			G 1: Y:10		$\boxtimes$	
	Location of	` '					Sealing Lid?			X
	_	ure and date included	?							X
	Were seals i									$\boxtimes$
12		have appropriate pre	•	ě.		Client specified in	formation?	$\boxtimes$		
	Is there a clie	nt indication that the s	submitted sam	ples are <b>pH</b> p	reserved?					X
	Were <b>VOA</b> v	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clies	nt/method/SOP requir	e that the analy	yst check the s	ample pH and	d if necessary alt	ter it?			X
13	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							X
14	Badges:	Are the badges p	roperly capped	d and intact?						$\times$
		Are dual bed bad	ges separated a	ınd individuall	y capped and	intact?				$\times$
LabS	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	ot / Pres	ervation	
<b></b>	mapro ID	Description	рН *	pН	pН	(Presence/Absence)		Commer		
P0901551	-001.01	125mL Plastic NP								
P0901551	-002.01	125mL Plastic NP								
P0901551		125mL Plastic NP								
P0901551	<del></del>	125mL Plastic NP								
P0901551		125mL Plastic NP								
P0901551		125mL Plastic NP				L	l .			
Explain at	ny discrepancies	: (include lab sample ID	numbers):							

05/07/09 1:32 PM

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0901551		
Project: JPL GW Mon 2Q09 / G486090		-		
Sample(s) received on: 05/07/09	Date opened: 05/07/09	hv:	MZAMORA	

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	
P0901551-007.01	125mL Plastic NP					
Machine and the second of the						
A CONTRACTOR OF THE CONTRACTOR						
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ACCURATION AND ADDRESS OF THE PARTY OF THE P						
		•		<b>****</b>		
The state of the s						
				-		
And the second s						
	1					

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Sample Matrix:

Project Number: G486090

WATER

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

Date Received: 05/07/09

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-12-5	P0901551-001	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-4	P0901551-002	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-3	P0901551-003	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-2	P0901551-004	0.010	0.003	1	NA	05/07/09 15:10	ND	
MW-12-1	P0901551-005	0.010	0.003	1	NA	05/07/09 15:10	ND	
DUPE-07-2Q09	P0901551-006	0.010	0.003	1	NA	05/07/09 15:10	ND	
EB-10-5/07/09	P0901551-007	0.010	0.003	1	NA	05/07/09 15:10	ND	
Method Blank	P0901551-MB	0.010	0.003	1	NA	05/07/09 15:10	ND	

Karu Rya



# CAS SR #P0901536

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### LABORATORY REPORT

May 7, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

(Judeste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of **27** 

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901536

Project:

JPL GW Mon 2Q09 / G486090

## **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

# SAMPLE CROSS-REFERENCE

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

Service Request: P0901536

### 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 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)

### **Oualifiers**

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 (POL).

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

2655 Park Center Drive, Suite A

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

Zn Acetate EQUIPMENT BUNK Asc Acid H2S04 Preservative Key NaOH HN03 Other TENET IT HCL Remarks Dupuscate DUPLICATE CAS Project No. က B 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 0 0 8270C 🗆 (Subcontracted) Semi-Volatile Organics GC/MS PH FC □ 8015M (Subcontracted) Oxygenates 🗌 TPH Gas □ 80928 □ **5**29 214319/BATTETLE ATTN: (CELALD TOMPKINS 505 KING AVE: 2009 Number of Containers OLLAMBUS, OH 4320 P.O. # / Billing Information JEC GW. MON Matrix G-186090 Project Number Project Name Sampler (Print & Sign) Date Time Collected Collected 5280 5007 4060 1134 701 109 Company Name & Address (Reporting Information) 3990 OLD TOWN AVE, C-205 Fax (805) 526-7270 O Laboratory ID Number 3 T 3 **Email Address for Result Reporting** DAVID COUNTY 52-09-05/06/09 SAN DIETO, CA -2009 DAGE-05-2009 An Employee - Owned Company Columbia Analytical Services 1152-725-919 Project Manager MW-20-5 MW-20-2 30-32ra 4-02-MM アン・カウ Client Sample ID MW-20-1 Phone

Project Requirements (MRLs, QAPP)

EDD required Yes / No Type:

equired Yes / No

Tier III - (Data Validation Package) 10% Surchatge

Tier V - (client specified)

Tier 1 - (Results/Default if not specified)

Fier II - (Results +

Report Tier Levels - please select

Cooler / Blank / Ice / No Ice

59 6/04 TIPES 32 Time: 7

literal Or

Received by: (Signature)

Temperature 2

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

Client:

Battelle

**Project:** JPL GW Mon 2Q09/G486090

Service Request: P0901536

<b>Bottle ID</b>	Tests	Date	Time	Sample Location / User	Disposed On
P0901536-001.01					
	7196A	-15100		0.40 /	
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-002.01					
	7196A	7/C/00	10.50	C) (C) (D) (C) (C) (C) (C) (C) (C) (C) (C) (C) (C	
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-003.01					
	7196A	# (C.100	10.50	0) (0 / ) (7 / ) (0) (	
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
20901536-004.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-005.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
20901536-006.01					
	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1359	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
20901536-007.01				10- <u>10-19-19-19-19-19-19-19-19-19-19-19-19-19-</u>	W
. 0,0,000 007.01	7196A				
		5/6/09	1352	SMO / MZAMORA	
		5/6/09	1352	P-37 / MZAMORA	
		5/6/09	1358	In Lab / SANDERSON	
		5/6/09	1749	P-37 / SANDERSON	
P0901536-008.01					6

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

Client: Project:

Battelle

JPL GW Mon 2Q09/G486090

Service Request: P0901536

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

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

	Battelle			Work order:	P0901536			
	the state of the s	2Q09 / G486090						
	s) received on:			Date opened: <u>05/06/09</u>	by:	MZAN		
		samples received by CAS. The use					indication	n of
compliance	or nonconformity	Thermal preservation and pH will o	nly be evaluated either a	t the request of the client and/or as re	equired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	N/A
1	Were cample	containers properly marked w	vith client sample II	<b>)</b> ?		X		
2	_	upplied by CAS?	rui enent sample il	<b>,</b>		$\boxtimes$		
		ontainers arrive in good condi	ition?			$\boxtimes$		
3	_		mon:			$\boxtimes$		
4		of-custody provided?	10			$\boxtimes$		
5		i-of-custody properly complet		0				
6	-	ontainer labels and/or tags ag		pers?		$\boxtimes$		
7	-	olume received adequate for a				$\boxtimes$		
8	_	vithin specified holding times?				$\boxtimes$		
9	1 1	mperature (thermal preservat	*	•		X		
	C	ooler Temperature	°C Blank	Temperature 3	_°C	_		_
10	-	ank received?					$\times$	
	Trip blank s	upplied by CAS:			<del>_</del>			
11	Were custody	seals on outside of cooler/Bo	x?				X	
	Location of	seal(s)?			_Sealing Lid?			$\boxtimes$
	Were signat	are and date included?						$\times$
	Were seals i	ntact?						X
	Were custody	seals on outside of sample cor	ntainer?				$\boxtimes$	
	Location of	seal(s)?			_Sealing Lid?			$\boxtimes$
	Were signat	are and date included?						X
	Were seals i	ntact?						X
12	Do containers	have appropriate preservation	n, according to met	hod/SOP or Client specified in	nformation?	X		
	Is there a clie	nt indication that the submitted	d samples are <b>pH</b> p	oreserved?				$\boxtimes$
		ials checked for presence/abse						X
		nt/method/SOP require that the			lter it?			X
13	Tubes:	Are the tubes capped and	<u>-</u>	ampie pir and <u>ir necessary</u> a				$\boxtimes$
13	i ures.	Do they contain moisture?						$\boxtimes$
1.4	D - J	•						$\boxtimes$
14	Badges:	Are the badges properly of		1				$\boxtimes$
		Are dual bed badges separ	rated and individual	ry capped and intact?	204 (0.0000000000000000000000000000000000	L	Ц	- I스I
Lab:	Sample ID	Container Requi		Adjusted VOA Headspac		it / Pres		1
		Description pH	* pH	pH (Presence/Absence	) (	Commer	its	
P090153 <i>6</i>	5-001.01	125mL Plastic NP						
P090153 <i>6</i>		125mL Plastic NP						
P0901536		125mL Plastic NP						
P0901536		125mL Plastic NP						
P0901536 P0901536		125mL Plastic NP 125mL Plastic NP						
		: (include lab sample ID numbers	)·	1	<u> </u>		<del></del>	
- mun a	, and openion	. (	/·					

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

Client: Battelle	Work order:	P0901536	
Project: JPL GW Mon 2Q09 / G486090			
Sample(s) received on: 05/06/09	Date opened: 05/06/09	by:	MZAMORA

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	
	Description	pH *	pН	pН	(Presence/Absence)	Comments
P0901536-007.01	125mL Plastic NP					
P0901536-008.01	125mL Plastic NP					
111111111111111111111111111111111111111						
	3.3.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4					
son son						
SANINA						
MATERIA CONTROL CONTRO						
NO.						
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Management of the second of th						

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

## **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901536

Date Collected: 05/06/09

Date Received: 05/06/09

Chromium, Hexavalent

Prep Method:

Test Notes:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

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

Karu Rya Date: 5/7/09

Report By:SAnderson



### CAS SR #P0901522

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		53A, 54, 54A, 55-56 ,56A
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### LABORATORY REPORT

May 27, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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>164</u>



Client: Project: Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901522

**CASE NARRATIVE** 

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

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

No anomalies were encountered during this analysis.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

**Client:** 

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901522

### SAMPLE CROSS-REFERENCE

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

### 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 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

Page / of \_

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

An Employee - Owned Company Phone Fax (80)	Phone (805) 526-7161 Fax (805) 526-7270		Hequested Turr   1 Day (100%)   2	urnaround ) 2 Day (75°	ime in E %) 3 Day	(50%) 4	<b>Jays (Su</b> Day (35°	rcharge (c) 5 De	<b>ss) ple</b> ay (25%	se circle ) 10 Day	naround Iime in Business Days (Surcharges) please circle : Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard	CASP	CAS Project No.	522
							Analy	sis Met	hod ar	Analysis Method and/or Analytes	rtes	CAS Contact	ontact:	
Company Name & Address (Reporting Information)	ng Information)	Project Name	ame											
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3990 and 10mm ====		つだっ	CALL MON	1007 1007	$\frac{1}{1}$		1	7	9		1			None
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		0609845)	0600		□ SI	ntra		aler e Salva e Alere e	***************************************			******		HOOO
<u>_</u>		P.O. # / Bi	P.O. # / Billing Information	ر مار	PH G	npco	<b>a</b> )		0				> 4	NaOH
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Phone Fax			AN KING AVE.	نط ا	] sət	12B ocou	C/W	161	, Z ,				9	Asc Acid
619-726-7311		8127	Columbas, off 43	43.201	уgena	08 lə	D so	4	)/ ()					Other
Email Address for Result Reporting	Sample	Sampler (Print & Sign)	(c	Confederation of the Confedera	2B 🗆	ow Lev	Organi	I	DA C			 		
					809g	el 8 ol L	əliti	I	01>					
Client Sample ID	Laboratory Date ID Number Collected	Time	Matrix	Number of Containers	TPH Gas	BTEX 802 TPH Diese TPH Diese	625 □ 82 Semi-Vola TPH FC	10	ROKI				Remarks	rks
MW-17-5	60/50/G (1)	0490	3	4				×	-					
12-17-WM	?			K				×	X				JSM/SM	
MW-17-3	(C)	1107		7				×						
MW-17-2	E)	////						×	<u> </u>					
1-11-MM	9	1213						X						
EB-08-5/05/09	(9)	1130		4				X	<del> </del>					
	)													
					7									
						<u> </u>	(	l	_					
Report Tier Levels - please select Fier 1 - (Results/Default if not specified)	]) -     Lier     - (	Data Validation	Tier III - (Data Validation Package) 10% Surg	Sureharde	2		ON / Sey Mail			FDD redii	FDD reciliired Yes / No	Projec	Project Requirements (MRLs, QAPP)	Ls, QAPP)
ier II - (Results # QC)	Tier V - (cl	Tier V - (client specified)			× 1	MDL/POL	POL / J required Yes / No	Yes / No		Type:				

Cooler / Blank / Ice / No Ice Temperature 30C

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901522

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed Or
P0901522-001.01					
	7196A	5/5/00	1.410	CMO / MZAMORA	
		5/5/09 5/5/09	1419 1421	SMO / MZAMORA P-37 / MZAMORA	
		5/5/09	1421	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	
P0901522-002.01					
	521				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
		5/15/09 5/15/09	1244 2346	In Lab / PMULHERIN K-HERK-A4 / PMULHERIN	
P0901522-002.02					
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
P0901522-002.03					
	7196A	# /# /OO	1.410		
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09 5/5/09	1439 1539	In Lab / SANDERSON P-37 / SANDERSON	
P0901522-002.04					
	8270C SIM				
		5/5/09	1419	SMO / MZAMORA	
		5/5/09	1421	P-16 / MZAMORA	
P0901522-002.05		5/5/00	1.420	CMO / MZ AMOD A	
		5/5/09	1420	SMO / MZAMORA	
		5/5/09 5/6/09	1422 1641	SUBBED / MZAMORA K-HERK-A4 / AJUELL	
P0901522-002.06					
1 0301322-002.00		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1422	SUBBED / MZAMORA	
		5/6/09	1641	K-HERK-A4 / AJUELL	
		5/15/09	1244	In Lab / PMULHERIN	
		5/15/09	2346	K-HERK-A4 / PMULHERIN	
P0901522-002.07				0)(0)()(7)(7)(0)	
		5/5/09	1420	SMO / MZAMORA	
		5/5/09	1421	P-37 / MZAMORA	
		5/5/09	1439	In Lab / SANDERSON	
		5/5/09	1539	P-37 / SANDERSON	

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901522

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

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

Client:	Battelle		Sampi	e Acceptance	CHECK FOIT	Work order:	P0901522			
Project:	JPL GW MO	N 2Q09 / G486090			•					
Sample(	s) received on	: 05/05/09		]	Date opened:	05/05/09	_ by:	MZAN	/IORA	
Note: This i	form is used for <u>all</u>	samples received by CAS.	The use of this form	n for custody seals	is strictly meant	to indicate presence/al	sence and not as a	n indication	on of	
compliance	or nonconformity.	Thermal preservation and p	H will only be eval	uated either at the	request of the cli	ent and/or as required	by the method/SOF			
								Yes	No	N/A
1	_	containers properly	marked with cl	ient sample II	)?			×		
2		supplied by CAS?						X		
3	Did sample c	ontainers arrive in go	ood condition?					X		
4	Was a chain-	of-custody provided?						X		
5	Was the chair	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/o	or tags agree wi	ith custody pap	pers?			X		
7	Was sample	volume received adequ	uate for analys:	is?				X		
8	Are samples	within specified holding	ng times?					X		
9	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		X		
		Cooler Temperature			Γemperature		°C			
10		ank received?			1		-		X	
	_	supplied by CAS:								
11	-	seals on outside of co	ooler/Box?				-		X	
	Location of						Sealing Lid?			×
		ture and date included	17		· · · · · · · · · · · · · · · · · · ·					X
	Were seals		•							X
		seals on outside of sa	mple container	•9					×	
	Location of		impre container	•			Sealing Lid?			$\boxtimes$
		cure and date included	9				_Seaming Liu?			$\mathbf{X}$
	Were seals		1.1							X
10				audina ta mat	- 4/COD (	71:: (: : : -	£			
12		have appropriate <b>pre</b>				ment specified in	TOTHIALION ?			$\boxtimes$
		ent indication that the			reserved?					×
		<u>rials</u> checked for prese								X
		nt/method/SOP requir	e that the anal	yst check the s	ample pH ar	nd <u>if necessary</u> alt	er it?			X
13	Tubes:	Are the tubes cap	ped and intact	?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	roperly capped	d and intact?						X
		Are dual bed bac	lges separated	and individual	ly capped an	nd intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	t / Pres	ervation	
		Description	pH *	pH	pH	(Presence/Absence)		ommer		
P0901522	-001 01	125mL Plastic NP			•					
P0901522		1000ml AG NP						* * * * * * * * * * * * * * * * * * * *		
P0901522		1000ml AG NP								
P0901522		125mL Plastic NP						· · · · · · · · · · · · · · · · · · ·		
P0901522		500mL AG NP								
P0901522		1000ml AG NP								
Explain as	ny discrepancies	s: (include lab sample II	numbers):							

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

Client: Battelle	Work order:	P0901522	
Project: JPL GW MON 2Q09 / G486090			
Sample(s) received on: 05/05/09	Date opened: 05/05/09	by:	MZAMORA

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

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

1,4 – Dioxane

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client:

Battelle

Client Project ID: JPL GW Mon 2Q09 / G486090

CAS Project ID: P0901522

1,4-Dioxane

Test Code:

EPA 8270C SIM Modified

Instrument ID:

HP5971A/HP5890 II/MS1

Analyst:

Test Notes:

Hani Cherazaie

Matrix:

Water

Date(s) Collected: 5/5/09

Date Received: 5/5/09 Date Extracted: 5/11/09

Date Analyzed: 5/11/09

Final Extract Volume:

 $1.0 \, \text{ml}(s)$ 

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

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

**Project Number:** G486090 Sample Matrix :

WATER

Service Request: P0901522

**Date Collected:** 05/05/09

**Date Received:** 05/05/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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



May 26, 2009

Analytical Report for Service Request No: P0901522

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

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Les Kennedy
Project Chemis

Project Chemist

LK/rh

Page 1 of <u>97</u>

### Acronyms

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a

substance allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

PQL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

### Inorganic Data Qualifiers

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

### Metals Data Qualifiers

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

### Organic Data Qualifiers

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

### Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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







### COLUMBIA ANALYTICAL SERVICES, INC.

Client:

Battelle

Project:

JPL GW Mon 2Q09

Sample Matrix:

Water

Service Request No.:

P0901522

Date Received:

5/5/09

### CASE NARRATIVE

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

### Sample Receipt

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

### Nitrosamines by EPA Method 521

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

Approved by Date 5/26/09

# Intra-Network Chain of Custody

CAS Contact: Sue Anderson

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

Project Number: Project Name: G486090 JPL GW Mon 2Q09

Company: Battelle

Project Manager: P0901522-002 Lab Code MW-17-4 Client Sample ID David Conner # of Cont. Matrix Date 5/5/09 Sample 0918 Time Date Received 5/5/09 KELSO Send To Nitrosamines 521 Ξ

**Test Comments** 

Nitrosamines - 521

P0901522-002

6

NDMA
MS/MSD on this sample

Folder Comments:

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

Reques	Reques	\(\frac{1}{N}\)s		PLEAS		Special Instructions/Comments
Requested Report Date: 05/22/09	Requested FAX Date:	Y STANDARD	1 2 3 4 5	PLEASE CIRCLE WORK DAYS	RUSH (Surcharges Apply)	Turnaround Requirements
EDD Y	PQL/MDL/J Y FM IN DATA INCLUSION TO	V. Data Validation Report with Raw Data	III. Results + QC and Calibration Summaries	II. Results + QC Summaries	I. Results Only	Report Requirements
	Bill to		P0901522	PO#		Invoice Information

Relinquished By:

1111 (115 5) 10 1160 Airbill Number.

Page |

## Columbia Analytical Services, Inc. Cooler Receipt and Preservation Form

PC Les

Client / Project: CAS - S()		-			ce Request	K09 PO	70152	2		
Received: 5-6-09	Opened: 5-0				soud					
<ol> <li>Samples were received via?</li> <li>Samples were received in: (circle</li> <li>Were <u>custody seals</u> on coolers?</li> </ol>		Ex UP Box Y N	Envel	-	GH G		Courier		and Deli NA	vered
If present, were custody seals int		Y N	-		ent, were the				Y	N
4. Is shipper's air-bill filed? If not,				•				NA	0	N
5. Temperature of cooler(s) upon	receipt (°C):		,5 (A	•						_
Temperature Blank (°C): Thermometer ID:	•		8							
6. If applicable, list Chain of Custo	dy Numbers:									<del></del>
7. Packing material used. Inserts	Baggies But	ble Wrap	Gel Pac	ks V	Vet Ice Slee	eves Other				
8. Were custody papers properly fil	led out (ink, signe	ed, etc.)?						NA	Ğ.	N
9. Did all bottles arrive in good co				table i	below.			NA	(A)	N
10. Were all sample labels complete	•			., .	, , ,			NA	(A)	N
<ul><li>11. Did all sample labels and tags ag</li><li>12. Were appropriate bottles/cont</li></ul>								NA NA	8	N N
<ul><li>Were appropriate bottles/cont</li><li>Were the pH-preserved bottles to</li></ul>						le helow		NA	Y	N
14. Were VOA vials received witho					The first section	001011	`	NA)	Y	N
15. Are CWA Microbiology sampl	-				emaining fr	om collectio		OA NA	. Y	N
16. Was C12/Res negative?								NA	Y	N
Sample ID on Bottle	Sample ID o	n COC		Sam	ple ID on Bot	ile	Sample	e ID or	n COC	
Sample ID	Bottle Count Bottle Type	Out of Hea		рН	Reagent	Volume added	Reagent Lo Number	ot	Initials	Time
										·····
<b>*</b>			COD -C	O GENT						· · · · · · · · · · · · · · · · · · ·
*Does not include all pH preserved sample ali Additional Notes, Discrepancies,			g SOP (SM	U-GEN)						
· · · · · ·										

# Organic Analysis: <a href="https://doi.org/10.2012/10.2012/2012">Nitrosamines by EPA 521</a>

Summary Package

Sample and QC Results

### COLUMBIA ANALYTICAL SERVICES, INC.

Client: Project:

Battelle

JPL GW Mon 2Q09/G486090

Service Request:

P0901522

### Cover Page - Organic Analysis Data Package Nitrosamines by EPA 521

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

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

Signature: Loner & Dont Book

Name: Lorer Pertwood

119/09

Title: Super V Dov

RR101925

### COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Sample Matrix:

Water

Service Request: P0901522

**Date Collected:** 05/05/2009

**Date Received:** 05/05/2009

Nitrosamines by EPA 521

Sample Name:

MW-17-4

Lab Code:

P0901522-002

Units: ng/L Basis: NA

**Extraction Method:** 

**METHOD** 

Level: Low

**Analysis Method:** 

521

Dilution Date Date **Extraction** Extracted Analyzed Lot Note MRL **MDL Factor** 

**Analyte Name** 

Result Q 0.82 J

2.0

05/15/09

N-Nitrosodimethylamine

0.54

05/16/09

KWG0904110

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

Comments:

Printed: 05/18/2009 15:42:41

Form 1A - Organic

10

SuperSet Reference:

1 of 7



### CAS SR #P0901477

### **Table of Contents**

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### LABORATORY REPORT

May 1, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

She Juden

Sue Anderson Project Manager

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Client: Project:

Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901477

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901477

### SAMPLE CROSS-REFERENCE

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

### 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.

# 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 GOLFHENT BLANK Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Remarks USN/SM 05W/CM CAS Project No. 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 EDD required Yes / No Type: Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J required Yes / No 8270C 

(Subconfracted) Semi-Volatile Organics GC/MS Volatile Organics □ 8260B □ 4S6 Received by: (Sign Number of Containers 776 GW MON 2009 Project Number ATTUS CATURED TOMPKINS 505 KING PUES Tier III - (Data Validation Package) 10% Surcharge 4 P.O. # / Billing Information Matrix 0609845 Corumbus Project Name Sampler (Print & Sign) Date Time Collected Tier V - (client specified) 6460 1511 130/06/0307 1013 1225 200 Company Name & Address (Reporting Information) 3940 OLD TOWN AVE, C-205 Laboratory ID Number 1 S Email Address for Result Reporting Tier 1 - (Results/Default if not specified) Fax Report Tier Levels - please select SAN TIEGO, CA Columbia
Analytical
Services Mc DAVID CONNET 1182-721-619 3-Relinquished by: (Signature) Fier II - (Results + QC) MW-18-5 Project Manager MW-18-7 H-81-MH MW-18-3 1-81-MW Client Sample ID 53-07 Phone

Cooler / Blank / Ice / No Ice

Received by: (Signature) Received by: (Signature

Relinquished (Signature)

Relinquished by: (Signature)

Temperature

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901477

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901477-001.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-002.01					
	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-002.02					
		4/30/09	1402	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-003.01					
. 0001777 000.01	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1426	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-004.01			·		
0,011,7,001,01	7196A				
		4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-004.02					
0,011// 001.02		4/30/09	1402	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-005.01					
-09014//-003.01	7196A				
	, , , VI L	4/30/09	1401	SMO / MZAMORA	
		4/30/09	1402	P-37 / MZAMORA	
		4/30/09	1427	In Lab / SANDERSON	
		5/1/09	0718	P-37 / SANDERSON	
P0901477-006.01					
07014//-000.01	7196A				
	/ 1 / 0 / 1	4/30/09	1401	SMO / MZAMORA	6
			1.01	SINO / MEMINIONA	J

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901477

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

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

CI.	<b>5 11</b>		Sampi	ie Acceptance	Check Form					
	Battelle	2000 / 0406000			_	Work order:	P0901477			
		2Q09 / G486090			- 1	0.4.10.0.10.0				
	s) received on			•	Date opened		_ by:	MZAN		
ivote: This i	form is used for a	ll samples received by CAS	3. The use of this:	form for custody	seals is strictly r	neant to indicate pres	ence/absence and	not as an	indicatio	n of
compliance		. Thermal preservation an				the 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:	marked with cl	ient sample II	)?			$\times$		
2	Container(s)	supplied by CAS?			ı			$\boxtimes$		
	-	ontainers arrive in go						X		
4	Was a chain-	of-custody provided?						X		
5	Was the chair	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/o	r tags agree wi	th custody par	pers?			X		
7	Was sample v	volume received adeq	uate for analys	is?				$\times$		
8	Are samples v	vithin specified holding	ng times?					X		
9	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eint adhered	to?		$\boxtimes$		
		Cooler Temperature			Γemperature	3	°C	_	_	_
10	Was a trip bla	-		,	- vinperarare		- ~		$\times$	
	-	upplied by CAS:							النشيا	
11	Were custody	seals on outside of c	ooler/Box?				-		X	
	Location of	seal(s)?					Sealing Lid?			$\boxtimes$
	Were signat	ure and date included	?							$\boxtimes$
	Were seals i									$\boxtimes$
	Were custody	seals on outside of sa	mnle container	-9					$\boxtimes$	
	Location of		mpro container	•			Scaling Lid?			×
		ure and date included	?				Sealing Lid?			
	Were seals i		•							X
12		have appropriate <b>pre</b>	searwation acc	ording to mot!	and/SOP or C	liant an acidiad in	C0			$\boxtimes$
12		nt indication that the				ment specified in	iormation?	$\boxtimes$		
					reservea?					X
		ials checked for prese								$\boxtimes$
		nt/method/SOP requir			ample pH and	d <u>if necessary</u> alt	er it?			$\times$
13	Tubes:	Are the tubes cap	ped and intact?	?						$\times$
		Do they contain r	noisture?							$\boxtimes$
14	Badges:	Are the badges p	roperly capped	l and intact?						X
		Are dual bed bad	ges separated a	nd individuall	y capped and	intact?				$\times$
Lab S	ample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	f / Prese	ervation	
		Description	pH*	pН	pН	(Presence/Absence)		ommen		
20901477-	-001.01	125mL Plastic NP								
P0901477-		125mL Plastic NP								
20901477-	-002.02	125mL Plastic NP								
20901477-		125mL Plastic NP							***	
20901477-		125mL Plastic NP								
20901477-		125mL Plastic NP								
Explain an	y discrepancies	(include lab sample ID	numbers):							

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

Client: Bat	telle	Work order:	P0901477		
Project: JPI	L GW Mon 2Q09 / G486090				
Sample(s) re	exerved on: 04/30/09	Date opened: 04/30/09	by:	MZAMORA	

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Hendspace (Presence/Absence)	
P0901477-005.01	125mL Plastic NP					l
P0901477-006.01	125mL Plastic NP					
20001177 000.01	TESTIBLI I III III					
				<del> </del>		
	`					
					1	
			*****			
			•			
				-		
					.,,,,	

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901477

**Date Collected:** 04/30/09

Date Received: 04/30/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Approved By

KMU Rya Date: 4/30/09



### CAS SR #P0901464

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Hexavalent Chromium Raw Data	15-24



### LABORATORY REPORT

April 30, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

Juleski

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of 24

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901464

Project:

JPL GW Mon 2Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901464

### SAMPLE CROSS-REFERENCE

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

### 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

Columbia 2655 Park Center Drive, Suite A Services Manage Company Phone (805) 526-7161

Fax (805) 526-7270

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

		Ī						Anal	vsis Me	hod and	Analysis Method and/or Analytes	se		CAS	CAS Contact:		
Company Name & Address (Reporting Information)	ng Informat		Project Name								`						
186TTELLE			1.		0					Preserva	Preservative Code				<u>.                                    </u>	Preservative Key	Key
12000 OLD TOWN AVE. C-205	E. C.2		JPC GW MON	- 1	1007				0	0 0						0 None	
			Project Number	_			(pe			,						1 HCL	
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Project Manager			P.O. # / Billing Information	Information	۸.	9 Hd	oqne			0							
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619-726-7311			500 MARSHS	s, off 4320	13201	deus	anS) 108 l€	)5) SC	31	97						7 Other	<u>.</u>
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						□ 8098 □ 8015B	108 le NoJ le		T	MA							
Client Sample ID ID N	Laboratory ID Number C	Date Collected	Time N	Matrix	Number of Containers	Volatile Or 624 □ 82 TPH Gas	BTEX 802 TPH Diese TPH Diese	TPH FC 625 BZ	15	IQN XOKI						Remarks	T
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) h-52-M	C)		1055						X								
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Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + QC)	Tier	- III - (Data V - (client	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	age) 10% Su	ırcharge	≥ ≥	MRL required Yes / No MDL / POL / J required Yes / No	d Yes / No	V Yes		EDD required Yes / No	N / sey, pe	0	Pro	ect Requirer	Project Requirements (MRLs, QAPP)	зарр)
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Relinquished by: (Signature)		in the second		10	Received by: (Signature)	Signature)	3		1001		The Control of the Co		Time	3	\¥ <b>~</b>	Ice / No Ice	
				_		) )					-		_	Ten	Temperature 🥕	ç J	

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

Client:

Battelle

Project: JPL GW Mon 2Q09/G486090

Service Request: P0901464

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

1508

1508

1528

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4/29/09

SMO / MZAMORA

P-37 / MZAMORA

In Lab / SANDERSON

P-37 / SANDERSON

SMO / MZAMORA

P-37 / MZAMORA

In Lab / SANDERSON

P-37 / SANDERSON

SMO / MZAMORA

P-37 / MZAMORA

In Lab / SANDERSON

P-37 / SANDERSON

P0901464-005.01

P0901464-006.01

P0901464-007.01

7196A

7196A

7196A

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

	Battelle		Samp		-	Work order:	P0901464			
•		2Q09 / G486090								
Sample(	s) received on:	04/29/09		_	Date opened:	04/29/09	_ by:	MZAN	1ORA	
		l samples received by CAS		-	-	-			indication	n of
compliance	or nonconformity.	Thermal preservation and	l pH will only be	evaluated either a	t the request of the	he client and/or as re	quired by the meth	od/SOP. <u>Yes</u>	No	<u>N/A</u>
1	Were sample	containers properly i	narked with cl	lient sample IE	)?			$\times$		
2	Container(s) s	upplied by CAS?		-				X		
3	` '	ontainers arrive in go	od condition?					X		
4	Was a chain-o	of-custody provided?						$\times$		
5	Was the chair	-of-custody properly	completed?					$\times$		
6		ontainer labels and/o	-	ith custody par	ers?			$\times$		
7	_	olume received adequ						$\boxtimes$		
8	_	vithin specified holding	•					$\overline{\times}$		
9	-	mperature (thermal )	-	of cooler at rec	eint adhered i	to?		$\overline{\mathbf{x}}$		
		ooler Temperature	probor (dison)		Γemperature	3	°C			
10	Was a trip bla	_		- C Diame	i emperature		_		$\boxtimes$	
10	_	upplied by CAS:							ت	_
11	•	seals on outside of co	ooler/Box?				<del>-</del>		X	
	Location of	seal(s)?					Sealing Lid?			X
		are and date included	?				_			X
	Were seals i									X
•		seals on outside of sa	mple containe	r?					$\boxtimes$	
	Location of		при сопшне				Sealing Lid?			×
		are and date included:	)				_ Staing Lia.			$\boxtimes$
	Were seals is		•							X
12		have appropriate pre	servation acc	cording to met	hod/SOP or C	lient specified in	aformation?	$\boxtimes$		
12		nt indication that the s		_		ment specified in	normanon:			$\boxtimes$
		ials checked for prese			reserved.					$\boxtimes$
	· ·	•			1 77	1 '6 1				
10		nt/method/SOP require		-	ampie pH and	i if necessary at	ter it?			$\boxtimes$
13	Tubes:	Are the tubes cap	•	!						$\boxtimes$
		Do they contain n								$\boxtimes$
14	Badges:	Are the badges p								$\boxtimes$
		Are dual bed badş	ges separated a	and individuall	y capped and	intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	
		Description	p <b>H</b> *	pН	pН	(Presence/Absence)	(	?ommer	its	
20901464	-001.01	125mL Plastic NP								
P0901464		125mL Plastic NP								
P0901464		125mL Plastic NP								
20901464		125mL Plastic NP					<u> </u>			
20901464 20901464		125mL Plastic NP 125mL Plastic NP						· <del></del>		
				<u> </u>			<u> </u>			
Explain at	ry discrepancies	(include lab sample ID	numbers):							

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

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

Client: Battelle	Work order:	P0901464		
Project: JPL GW Mon 2Q09 / G486090				
Sample(s) received on: 04/29/09	Date opened: 04/29/09	by:	MZAMORA	

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	
	Description	pH *	pН	рH	(Presence/Absence)	Comments
P0901464-007.01	125mL Plastic NP					
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Constitution (Constitution )						100 Suprate Victoria
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What is a second						
NAPA) WALLEY CO.						
					·	
						- 1871 M. S.
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Explain any discrepancies: (include lab sample ID numbers):

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901464

Date Collected: 04/29/09

Date Received: 04/29/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Kau Rya Date: 4/30/09



### CAS SR #P0901451

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Sample Cross-Reference	 3
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Internal Chain of Custody	6
Sample Acceptance Check Form	7-8
Hexavalent Chromium Analytical Data	 9-14
Hexavalent Chromium Raw Data	15-24



### LABORATORY REPORT

April 29, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

Quelesse-

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of \_*24* 

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901451

Project:

JPL GW Mon 2Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901451

### SAMPLE CROSS-REFERENCE

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

Page 1 of 1

### 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 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

Project Name   Proj	Analysis Method and/or
Project Number   Proj	Pole
10   10   10   10   10   10   10   10	10   10   10   10   10   10   10   10
With the property of the prope	Material Companies of the Cart
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Matrix  Matrix	Matrix  Matrix
Matrix  Mumber of Containing State S	Matrix  Multiple On Indian Containers of Con
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1	1
	-

Cooler / Blank / Ice / No Ice

Date:

Temberature

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901451

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901451-001.01					
	7196A	4/80/00	1010	0) (0 / 00Th D) TO	
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-002.01					
	7196A	. (= = /= =			
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-003.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1346	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-004.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-005.01					
	7196A				
		4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-006.01					<u> </u>
. 55 01 151 000,01	7196A				
	· <del>-</del>	4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
20901451-007.01					
. 0701471-007.01	7196A				
	, . , . ,	4/28/09	1313	SMO / SSTAPLES	
		4/28/09	1321	P-37 / SSTAPLES	
		4/28/09	1347	In Lab / SANDERSON	
		4/28/09	1536	P-37 / SANDERSON	
<del></del>		0, 0,	-550		6

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

Client	Battelle		Sampi	e Acceptance	Спеск гогш	Work order:	P0901451			
		2Q09 / G486090			-	WOIR Older.	1001431			
	s) received on:				Date opened:	04/28/09	by:	SSTAI	PLES	
		I samples received by CAS	The use of this	•	_		_			n of
		Thermal preservation and		-	•	_				
		F	· Fam				4	Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly i	narked with cl	ient sample II	)?			$\times$		
2	Container(s) s	supplied by CAS?						$\boxtimes$		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Was a chain-o	of-custody provided?						$\times$		
5	Was the chair	i-of-custody properly	completed?					$\boxtimes$		
6		ontainer labels and/o	-	th custody par	pers?			$\times$		
7	-	olume received adeq						$\boxtimes$		
8	-	vithin specified holding	•					X		
9	•	emperature (thermal)	-	of cooler at rec	eint adhered t	n?		$\boxtimes$		
		ooler Temperature	preservation, e		Γemperature	3	°C		3,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
10	Was a trip bla	•		C Blank	i emperature	<u></u>			X	
10								ш		ш
1.1	-	upplied by CAS:	-1/709		· · · · · · · · · · · · · · · · · · ·			П	তো	_
11	•	seals on outside of co	ooler/Box?				G 11 T 10		$\boxtimes$	
	Location of	` '	_				_Sealing Lid?			$\boxtimes$
	-	ure and date included	?							X
	Were seals i	ntact?								$\boxtimes$
	Were custody	seals on outside of sa	mple container	r?					$\times$	
	Location of	seal(s)?					_Sealing Lid?			X
	Were signate	ure and date included	?							$\times$
	Were seals i	ntact?								X
12	Do containers	have appropriate pre	servation, acc	ording to met	hod/SOP or C	lient specified in	formation?	$\times$		
	Is there a clie	nt indication that the s	submitted samp	ples are <b>pH</b> p	reserved?					$\times$
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	f air bubbles?						$\boxtimes$
	Does the clier	nt/method/SOP requir	e that the analy	vst check the s	ample pH and	l if necessary al	ter it?			$\boxtimes$
13	Tubes:	Are the tubes cap	•		. r . r					X
10		Do they contain n	•							$\boxtimes$
14	Badges:	Are the badges p	roperly capped	d and intact?						$\times$
		Are dual bed bad	ges separated a	ınd individual	y capped and	intact?				$\boxtimes$
Tab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	t / Pres	ervation	
		Description	pH *	pН	pН	(Presence/Absence)		ommer		
P0901451	-001.01	125mL Plastic NP							Processor Control Control	
P0901451		125mL Plastic NP							<del></del>	
P0901451	-003.01	125mL Plastic NP								
P0901451		125mL Plastic NP								
P0901451		125mL Plastic NP								
P0901451		125mL Plastic NP				* * . * . * . * . * . * . * . * . * . *				
Explain a	ny discrepancies	: (include lab sample ID	numbers):							

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

Client: Battelle	Work order:	P0901451		
Project: JPL GW Mon 2Q09 / G486090				
Sample(s) received on: 04/28/09	Date opened: 04/28/09	by:	SSTAPLES	

Lab Sample ID	Container	Required	Received		VOA Headspace	
	Description	p <b>H</b> *	pН	pН	(Presence/Absence)	Comments
P0901451-007.01	125mL Plastic NP					
ALL PARK						
	·····					
2011						
en and a second						
9844						
				*		
					, ,	
	***************************************					
<b>****</b>						

Explain any discrepancies: (	include lab cample ID r	nimbore).		
explain any discrepancies. (	merade iab sampre id i	rumbers).		

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

### COLUMBIA ANALYTICAL SERVICES, INC.

### Analytical Report

Client:

Battelle

Project Name:

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901451

**Date Collected:** 04/28/09

Date Received: 04/28/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Karu Rya Date: 4/29/09 10

Report By:SAnderson



### CAS SR #P0901437

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Heyayalent Chromium Raw Data	14.24



### LABORATORY REPORT

April 28, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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.

Cinderse

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of \_*24* 

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901437

Project:

JPL GW Mon 2Q09 / G486090

### **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901437

### SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0901437-001	MW-3-5	4/27/09	07:50
P0901437-002	MW-3-4	4/27/09	08:20
P0901437-003	MW-3-3	4/27/09	08:50
P0901437-004	MW-3-2	4/27/09	09:22
P0901437-005	MW-3-1	4/27/09	09:54
P0901437-006	EB-04-4/27/09	4/27/09	09:40

### 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.

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

Columbia Analytical

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

Zn Acetate CAS Projet No. CLO 143 EDVIDUENT BLANK Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 Other Remarks ac LOST TI 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 0 Q MRL reddined Yes / Wo MDL / POLV J reddined Yes / No C X × X × × Semi-Volatile Organics GC/MS S25 □ 8270C □ (Subcontracted) TPH FC □ 8015M (Subcontracted) TPH Gas 8015B □ S260B Oxygenates TPH Gas Number of Containers BITEN: GÉMBLD TOMPHINS 505 KING ANG. 576 (54 40) 2809 Project Number COLUMBUS, Of 43201 Tier III - (Data Validation Package) 10% Surcha<del>rgs</del> Tier V - (client specified) \_\_\_\_\_ P.O. # / Billing Information スパタ/をかけられ Matrix 0609849 Project Name Sampler (Print & Sign) Date Time Collected Collected 25/00 60/±Z 620 0820 0922 2560 040 Company Name & Address (Reporting Information) 3990 OLD TOWN AVE, C-205 Laboratory ID Number ENE PO SAN DIECO, CA 92110 Email Address for Result Reporting COUNCE Tier 1 - (Resulfs/Default if not specified) Report Tier Levels - please select 8 1151-726-7311 ın Employee - Owned Company Fier II - (Results) + QC) PL/QCF 6-60-83 Project Manager Client Sample ID MW-3-5 MW-3-2 MW-3-MW-3-3 Mw-3-4

Cooler / Blank / Ice / No Ice Temperature 70C

Met OC

Received by: (Signature,

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

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

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Samp	е Ассертансе	- Check Form	Work order:	P0901437			
Project:	JPL GW Mon	2Q09 / G486090								
Sample(	s) received on:	04/27/09	-	_	Date opened:	04/27/09	by:	MZAN	1ORA	
Note: This	form is used for a	ll samples received by CAS	. The use of this	form for custody	seals is strictly n	neant to indicate pre-	sence/absence and r	not as an	indicatio	n of
compliance	or nonconformity	. Thermal preservation and	l pH will only be	evaluated either a	t the request of t	he client and/or as re	equired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly i	narked with cl	ient sample II	)?			$\times$		
2	Container(s)	supplied by CAS?						$\boxtimes$		
3	Did sample c	ontainers arrive in go	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/o	r tags agree wi	ith custody par	pers?			$\boxtimes$		
7	-	volume received adeq			•			$\times$		
8	-	within specified holding	•					$\times$		
9	-	emperature (thermal)	-	of cooler at rec	eint adhered	to?		X		
,		Cooler Temperature	2		Temperature		°C	_	_	_
10		ank received?		. C Diank	i emperature		_ ~		$\boxtimes$	
10	_	supplied by CAS:						leggel .	leineid	-
11	•	seals on outside of co	ooler/Box?	•		<del>"</del>			X	
	Location of						Sealing Lid?			X
		ure and date included	· ·							X
	Were seals i		•							×
		seals on outside of sa	mnle containe	r?					$\boxtimes$	
	Location of		трте сонтате	1;			Sealing Lid?			$\boxtimes$
		. ,					_ Searing Liu:			$\boxtimes$
	_	ure and date included	<b>'</b>							
	Were seals i		4.		L = 1/0 OD = = 0	N'	· C- · · · · · · · · · · · · · · · · · ·			$\boxtimes$
12		have appropriate pre		_		ment specified if	normation?	$\boxtimes$		
		nt indication that the s	•		reserved?					$\boxtimes$
	Were <u>VOA v</u>	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clie	nt/method/SOP requir	e that the analy	yst check the s	ample pH and	d if necessary a	Iter 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?						$\boxtimes$
		Are dual bed bad	ges separated a	and individual	ly capped and	l intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervation	
	1	Description	рН *	pН	рH	(Presence/Absence		ommer?		
P0901437	-001.01	125mL Plastic NP								
P0901437	'-002.01	125mL Plastic NP								
P0901437	7-003.01	125mL Plastic NP								
P0901437		125mL Plastic NP							······································	
P0901437		125mL Plastic NP								
P0901437		125mL Plastic NP			<u> </u>	<u> </u>				
Explain a	ny discrepancies	:: (include lab sample ID	numbers):							

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# Analytical Report

Client:

Battelle

Service Request: P0901437

**Project Name:** 

JPL GW Mon 2Q09

Date Collected: 04/27/09

Project Number: G486090

Date Received: 04/27/09

Sample Matrix: WATER

Analysis Method: 7196A

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-3-5	P0901437-001	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-4	P0901437-002	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-3	P0901437-003	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-2	P0901437-004	0.010	0.003	1	NA	04/27/09 15:50	ND	
MW-3-1	P0901437-005	0.010	0.003	1	NA	04/27/09 15:50	ND	
EB-04-4/27/09	P0901437-006	0.010	0.003	1	NA	04/27/09 15:50	ND	
Method Blank	P0901437-MB	0.010	0.003	1	NA	04/27/09 15:50	ND	

Kau Rya Date:

9



# CAS SR #P0901409

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CAS - Kelso Data Package	85-201



#### LABORATORY REPORT

May 13, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

ne Ondestr

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of <u>201</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client: Project:

Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901409

#### CASE NARRATIVE

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

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

No anomalies were encountered during this analysis.

# Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901409

# SAMPLE CROSS-REFERENCE

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

# 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.

# 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

EQUIPMENT BYNK Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) このナニの Preservative Key H2S04 HN03 NaOH HCL Remarks DUPLICATE Trapulant 125/M5D 72×/20 S 9 1 CAS Project No. CAS Contact Filme: C 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 0 X Х equired Yes / No 0 (Subcontracted) 8270C 🗆 Semi-Volatile Organics GC/MS TPH FC 🗆 8015M (Subcontracted) Low Level 8015B [ (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ Received by: (Signature) Received by: (Signature Volatile Organics GC/MS 624 □ 8260B □ Oxygena □ setenetyxO □ 80828 TPH Gas SPL GW MON 2009 Number of Containers 2.4319 Billing Information 2.4319 BATTELLE ATTN: GENELD TOMPKINS Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) COLUMBUS, OH 4320 505 KING AVE. Matrix 0609845 Project Number Project Name 9/13/49 Sampler (Print & Sign) Time Collected 5460 1/23/09 0845 8501 1337 1200 1251 Date Collected 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number SAN DIEGO, CA 92110 5% O  $\infty$ Email Address for Result Reporting Tier 1 - (Results/Default if not specified) CONNER 607 Report Tier Levels - please select 2009 - 2000 Services MG. 1182-921-63 Columbia Analytical Services™ An Employee - Owned Company Relinbuisted Dy\_ (Signature) Relinquished by: (Signature) Tier II - (Results #QC) BATTELLE 4-14-2 Project Manager 4-45-MM DAPE 101 MW-24-5 Mw-24-3 MW-24-DAVID Client Sample ID DUPE-02 50-82 Phone

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901409-001.01					
	7196A	4/22/00	1544	GN 40 / N 47 A N 40 P A	
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-002.01					
	7196A	4/00/00	1544		
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	***************************************
20901409-002.02					
		4/23/09	1546	SMO / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-003.01				·	
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-003.02					
		4/23/09	1547	SMO / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	•
		4/23/09	1727	P-37 / SANDERSON	
P0901409-004.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
20901409-005.01					
	521				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
20901409-005.02					
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
		5/1/09	1200	In Lab / LPORTWOOD	A
		5/1/09	1707	K-HERK-A3 / LRAVERT	$\epsilon$

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901409-005.03				· · · · · · · · · · · · · · · · · · ·	
	7196A	4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-005.04					
	8270C SIM	. (2.2.10.0			
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	P-16 / MZAMORA	
P0901409-006.01					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-007.01					
	521				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
		5/1/09	1200	In Lab / LPORTWOOD	
		5/1/09	1707	K-HERK-A3 / LRAVERT	
P0901409-007.02					
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	SUBBED / MZAMORA	
		4/27/09	1312	K-HERK-A3 / AJUELL	
P0901409-007.03					
	7196A				
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1549	In Lab / SANDERSON	
		4/23/09	1727	P-37 / SANDERSON	
P0901409-007.04					
	8270C SIM	,		a. (a. (a. (a. (a. (a. (a. (a. (a. (a. (	
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1545	P-16 / MZAMORA	
20901409-008.01					
	7196A	1/02/02	4 ** 4 *	0.00 (3.07.13.00)	
		4/23/09	1544	SMO / MZAMORA	
		4/23/09	1544	P-37 / MZAMORA	
		4/23/09	1550	In Lab / SANDERSON	

Client:

Battelle

Project: JPL GW Mon 2Q09/G486090

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

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle				_	Work order:	P0901409			
Project:	JPL GW Mor	n 2Q09 / G486090								
Sample(s	s) received on	: 04/23/09			Date opened:	04/23/09	by:	MZAN	10RA	
Note: This	form is used for a	Il samples received by CAS	. The use of this	form for custody	seals is strictly n	neant to indicate pre-	sence/absence and	not as an	indication	n of
compliance	or nonconformity	v. Thermal preservation and	pH will only be	evaluated either a	t the request of t	he client and/or as re	equired by the metl		Nio	NI/A
1	777 1			:41- IT	<b>N</b> 0			<u>Yes</u> ⊠	<u>No</u> □	<u>N/A</u>
1	•	containers properly i	narked with ci	ient sampie il	)?					
2	` '	supplied by CAS?						$\boxtimes$		
3	-	containers arrive in go	od condition?					X		
4	Was a chain-	of-custody provided?						$\boxtimes$		
5	Was the chair	n-of-custody properly	completed?					$\boxtimes$		
6	Did sample c	container labels and/o	r tags agree wi	th custody pap	pers?			X		
7	Was sample	volume received adequ	ate for analys	is?				$\times$		
8	Are samples v	within specified holding	g times?					$\times$		
9	Was proper to	emperature (thermal)	oreservation) o	of cooler at rec	eipt adhered	to?		X		
	(	Cooler Temperature		°C Blank	Гетрегаture	3	°C			
10	Was a trip bl	ank received?	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	'			_		X	
	-	supplied by CAS:								
11		y seals on outside of co	ooler/Box?		***************************************				$\boxtimes$	
	Location of						Sealing Lid?			$\times$
		ture and date included	)				_			$\boxtimes$
	Were seals i									$\boxtimes$
		seals on outside of sa	mnle containe	-7					X	
	Location of		inpre containes	•			Sealing Lid?			$\overline{\times}$
		ture and date included:	)				_ Bearing Liu:			$\boxtimes$
	Were seals i									$\boxtimes$
10			<b>4</b> : 600	amilia a ta manti	4/COD C	liant annaifiad in	Same ation 2			
12		have appropriate pre	•	-		nem specified if	HOTHIAUOH?	$\boxtimes$		
		ent indication that the s	-		reserved?					$\boxtimes$
		<u>vials</u> checked for prese								X
	Does the clie	nt/method/SOP requir			ample pH and	l if necessary al	ter it?			$\times$
13	Tubes:	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							X
14	Badges:	Are the badges p	roperly capped	I and intact?						$\times$
	_	Are dual bed bads	ges separated a	nd individuall	y capped and	intact?				$\boxtimes$
7.1.6	omente TD	Container	Required	Received	Adjusted	VOA Headspace	Damin	t / Pres	aura Fiar	
Laus	ample ID	Description	pH *	pH	pH	(Presence/Absence)		Commen		
	004.04	1	1777	1,11	l.v.	(110,000	l l			
20901409		125mL Plastic NP								
20901409 20901409		125mL Plastic NP 125mL Plastic NP								$\parallel$
20901409	<del></del>	125mL Plastic NP								
20901409		125mL Plastic NP								
20901409		125mL Plastic NP								
Explain at	v discrepancies	s: (include lab sample ID	numbers).							

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0901409	
Project: JPL GW Mon 2Q09 / G486090			
Sample(s) received on: 04/23/09	Date opened: 04/23/09	by:	MZAMORA

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receipt / Preservation
Lao Sample 119	Description	pH *	pH	pH	(Presence/Absence)	Comments
P0901409-005.01	1000ml AG NP					
P0901409-005.02	1000ml AG NP					
P0901409-005.03	125mL Plastic NP					
P0901409-005.04	500mL AG NP					
P0901409-006.01	125mL Plastic NP					
P0901409-007.01	1000ml AG NP					
P0901409-007.02	1000ml AG NP					
P0901409-007.02	125mL Plastic NP					
	<del></del>					
P0901409-007.04	500mL AG NP					
P0901409-008.01	125mL Plastic NP					
			<del></del>			
			·····			
						·
	·					
					·	
, 12 to 1000 to						
**************************************						
				***************************************		
						***************************************

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

1,4 – Dioxane

**ANALYSIS** 

# **RESULTS OF ANALYSIS** Page 1 of 1

Client:

Battelle

Client Project ID: JPL GW Mon 2Q09 / G486090

CAS Project ID: P0901409

1,4-Dioxane

Test Code:

EPA 8270C SIM Modified

Instrument ID:

HP5971A/HP5890 II/MS1

Analyst:

Hani Cherazaie

Matrix: Test Notes: Water

Date(s) Collected: 4/23/09

Date Received: 4/23/09

Date Extracted: 4/29/09 Date Analyzed: 4/29/09

Final Extract Volume:

 $1.0 \, \text{ml}(s)$ 

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

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901409

Date Collected: 04/23/09

Date Received: 04/23/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

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-24-5	P0901409-001	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-4	P0901409-002	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-3	P0901409-003	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-2	P0901409-004	0.010	0.003	1	NA	04/23/09 16:30	ND	
MW-24-1	P0901409-005	0.010	0.003	1	NA	04/23/09 16:30	ND .	
DUPE-01-2Q09	P0901409-006	0.010	0.003	1	NA	04/23/09 16:30	ND	
DUPE-02-2Q09	P0901409-007	0.010	0.003	1	NA	04/23/09 16:30	ND	
EB-03-4/23/09	P0901409-008	0.010	0.003	1	NA	04/23/09 16:30	ND	
Method Blank	P0901409-MB	0.010	0.003	1	NA	04/23/09 16:30	ND	

Date:

Report By:SAnderson

# **DIVIDER SHEET**

**CAS-KELSO** 

Data Package



May 6, 2009

Analytical Report for Service Request No: P0901409

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

RE: JPL GW Mon 2Q09/G486090

Dear Sue:

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

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

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Les Kennedy
Project Chemist

LK/ln

Page 1 of //7

# Acronyms

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a

substance allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

POL Practical Quantitation Limit

RCRA. Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

# Inorganic Data Qualifiers

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

#### Metals Data Qualifiers

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

# Organic Data Qualifiers

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

# Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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





Client: Project: Battelle

JPL GW Mon 2Q09

Sample Matrix:

Water

Service Request No.:

P0901409

Date Received:

04/23/09

#### CASE NARRATIVE

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

# Sample Receipt

Approved by\_

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

#### Nitrosamines by EPA Method 521

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

Rt.	02/06/01
	Date

1.5

# Intra-Network Chain of Custody 2655 Park Center Drive, Suite A. Simi Valley, CA 93065 · 805 · 526 · 7161 · FAX 805 · 526 - 7270

CAS Contact: Sue Anderson

JPL GW Mon 2Q09 Project Name:

Project Nur

CTest Comments

Nitrosamines - 521

P0901409-005,7

NDMA

# Folder Comments:

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

Special Instructions/Comments	Turnaround Requirements	Report Requirements	Invoice Information
	RUSH (Surcharges Apply)	L Results Only	
	PLEASE CIRCLE WORK DAYS 1 2 3 4 5	II. Results + QC Summaries  III. Results + QC and Calibration Summaries	PO# P0901409
	STANDARD	IV. Data Validation Report with Raw Data	AAA, AAT-SAN AA
	Requested FAX Date:	PQL/MDL/3 Y	Bill to
	Requested Report Date: 05/10/09	EDU $\underline{X}$	
	0 00		

Received By

Refinduished By:

# Columbia Analytical Services, Inc. Cooler Receipt and Preservation Form

PC\_LOS

Client / Project: <u>las Simi</u> Service Request <u>K09</u> DOGO1 40	9
Received: 4/25/09 Opened: 4/25/09 By: (Manda	•
1. Samples were received via? US Mail Fed Ex UPS DHL GH GS PDX Courier 2. Samples were received in: (circle) Cooler Box Envelope Other 3. Were custody seals on coolers? NA Y N If yes, how many and where?	Hand Delivered NA
If present, were custody seals intact?  Y  N  If present, were they signed and dated?  4. Is shipper's air-bill filed? If not, record air-bill number: 1778905X 4440200309  NA	Y N
5. Temperature of cooler(s) upon receipt (°C):  Temperature Blank (°C):  Thermometer ID:  6. If applicable, list Chain of Custody Numbers:	
7. Packing material used. Inserts Baggies Bubble Wrap Get Packs Wet Ice Sleeves Other  8. Were custody papers properly filled out (ink, signed, etc.)?  NA	
<ol> <li>Did all bottles arrive in good condition (unbroken)? Indicate in the table below.</li> <li>Were all sample labels complete (i.e analysis, preservation, etc.)?</li> <li>Did all sample labels and tags agree with custody papers? Indicate in the table below</li> </ol> NA	N N
12. Were appropriate bottles/containers and volumes received for the tests indicated?  NA  13. Were the pH-preserved bottles tested* received at the appropriate pH? Indicate in the table below  14. Were VOA vials received without headspace? Indicate in the table below.	Y N Y N
15. Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?  16. Was C12/Res negative?	Y N Y N
Sample ID on Bottle Sample ID on COC Sample ID on Bottle Sample ID	on COC
Bottle Count Out of Head-Sample ID Bottle Type Temp Space Broke pH Reagent added Number	Initials Time
*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).	
Additional Notes, Discrepancies, & Resolutions:	Q

# Organic Analysis: Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client:

Battelle

Project: JPL GW Mon 2Q09/G486090

Service Request:

P0901409

# Cover Page - Organic Analysis Data Package Nitrosamines by EPA 521

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

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

Signature:	Am & Dhed	Name: Lorda Portifol
Date:	5/6/09	Title: Supervibor

Cover Page - Organic

Page 1 of **97** 

Analytical Results

Client:

Battelle

Project: Sample Matrix: JPL GW Mon 2Q09/G486090

Water

Service Request: P0901409

**Date Collected:** 04/23/2009 Date Received: 04/23/2009

Nitrosamines by EPA 521

Sample Name:

MW-24-1

Lab Code:

P0901409-005

**Extraction Method:** 

**METHOD** 

Analysis Method:

521

Units: ng/L

Basis: NA

Level: Low

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

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

Comments:

Printed: 05/06/2009 08:15:49 u-\Stealth\Crystal.rpt\Form1m.rpt

Form 1A - Organic

13

Analytical Results

Client:

Battelle

Project: Sample Matrix: JPL GW Mon 2Q09/G486090

Water

Service Request: P0901409

Date Collected: 04/23/2009

Date Received: 04/23/2009

Nitrosamines by EPA 521

Sample Name:

DUPE-02-2Q09

Lab Code:

P0901409-007

**Extraction Method:** 

**METHOD** 

**Analysis Method:** 

521

Units: ng/L Basis: NA

Level: Low

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

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

Comments:

Printed: 05/06/2009 08:15:50

Merged

Analytical Results

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Sample Matrix:

Drinking water

Service Request: P0901409

Date Collected: NA

Date Received: NA

Nitrosamines by EPA 521

Sample Name:

Lab Code:

Method Blank

KWG0903710-4

Units: ng/L Basis: NA

Extraction Method:

METHOD

Level: Low

Analysis Method:

521

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

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

Comments:

Printed: 05/06/2009 08:15:50 u\Stealth\Crystal rpt\Form\m.rpt

Merged

Form 1A - Organic

SuperSet Reference: RR101490

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# CAS SR #P0901384

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#### LABORATORY REPORT

April 24, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains \_25 pages.

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

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

Aulerta-

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of 25

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0901384

Project:

JPL GW Mon 2Q09 / G486090

# **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901384

# SAMPLE CROSS-REFERENCE

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

# 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.

TDSTotal Dissolved SolidsTPHTotal Petroleum HydrocarbonsTSSTotal 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.

# **JOIL - CHAIN OF CUSTODY MECOFD & ANALYTICAL DEFVICE MEQUEST** אמופו מ

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

Columbia

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

SIAN Zn Acetate **Asc Acid** Project Requirements (MRLs, QAPP) Preservative Key H2S04 NaOH HN03 Other GOU PHENT HCL Remarks Cooler / Blank / Ice / No Ice ASW/SY Temperature 20 CAS Project No. Ŋ CAS Contact: C EDD required Yes / 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 Date Analysis Method and/or Analytes Preservative Code Type: 0 0 MDL / PQL / J required Yes / No Tailer A 0 X X X X X  $\times$ MRL required Yes / No 8270C 🗆 (Subcontracted) □ 9Z9 SM\DD soinganile Organics GC\MS TPH FC □ 8015M (Subcontracted) Low Level 8015B [ (Subcontracted) TPH Diesel 8015B 

(Subcontracted) Received by: (Signature) ☐ 81208 X3T8 TPH Gas 8015B Received-by: (Signature) Received by: (Signature) 82608 🗌 Oxygenates ☐ sab H9T □ **†**79 Volatile Organics GC/MS Number of Containers JPL GOW MON 2009 OTTN: GERALD TOMPKINS 505 KING AVE. fier III - (Data Validation Package) 10% Surcharge of 4320 7 7 Ч Matrix 060984-9 Project Number 3 JOHN BUS Project Name dirio Sampler (Print & Sign) Tier V - (client specified) Time Collected 2580 050 1103 122/08/13 1-560 250 Ďate: , Date Collected 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number 3 P S SAN DIEGO, CA 92110 Email Address for Result Reporting Tier 1 - (Results/Default if not specified) Fax 8 Report Tier Levels - please select CONVER Analytical Services Inc. 1182-922-619 Employee - Owned Company Relinquished (Signature) Relinquished by: (Signature) Relinquisped by: (Signature) BATTELLE 150 Fier II - (Results + QC) Project Manager 4-22-MM MM-22-3 ガーイン・グ 4W-77-5 1-22-MW Client Sample ID 3-02. DAVID Phone

ပွ

# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901384

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901384-001.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-002.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-002.02					
		4/22/09	1323	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-003.01					
2 0 9 0 2 0 0 1 0 0 0 0 0 0	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-004.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-005.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	
P0901384-006.01					
	7196A				
		4/22/09	1322	SMO / MZAMORA	
		4/22/09	1349	In Lab / SANDERSON	
		4/22/09	1639	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle					Work order:	P0901384			
•		1 2Q09 / G486090								
	s) received on	<del></del>	·	-	Date opened		by:	MZAN		·····
		ll samples received by CAS		•		<del>-</del>			indication	n of
compliance	or nonconformity	. Thermal preservation and	d pH will only be	evaluated either a	it the request of	the client and/or as re	equired by the meth	od/SOP.  Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly	marked with cl	ient sample H	<b>)</b> ?			$\boxtimes$		
2	_	supplied by CAS?						$\boxtimes$		
		ontainers arrive in go	od condition?					$\boxtimes$		
4	-	of-custody provided?						$\boxtimes$		
5		n-of-custody properly					·	$\boxtimes$		
		ontainer labels and/o	-	ith custody pa	pers?			$\boxtimes$		
7	=	volume received adeq			L			$\times$		
		within specified holding						$\boxtimes$		
9	-	emperature (thermal)	•	of cooler at rec	ceipt adhered	to?		$\times$		
		Cooler Temperature	,		Temperature		°C			
10		ank received?		•	-				$\times$	
	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	?							$\boxtimes$
	Were seals i	ntact?								$\boxtimes$
	Were custody	seals on outside of sa	mple containe	r?					$\times$	
	Location of	seal(s)?					_Sealing Lid?			X
	Were signat	ure and date included	?							$\times$
	Were seals i	ntact?								$\times$
12	Do containers	have appropriate pre	servation, acc	ording to met	hod/SOP or C	Client specified in	formation?	$\times$		
	Is there a clie	nt indication that the s	submitted samp	oles are pH p	reserved?					X
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clien	nt/method/SOP requir	e that the analy	st check the s	ample pH and	d <u>if necessary</u> al	ter it?			$\times$
13	Tubes:	Are the tubes cap	ped and intact	?						$\boxtimes$
		Do they contain n	noisture?							$\boxtimes$
14	Badges:	Are the badges p	roperly capped	and intact?						$\times$
		Are dual bed badg	ges separated a	nd individuall	y capped and	I intact?				$\boxtimes$
Lab S	sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	/ Prese	ervation	
	ı	Description	p <b>H</b> *	pН	pН	(Presence/Absence)		ommen		
P0901384	-001.01	125mL Plastic NP							************	
P0901384		125mL Plastic NP								
P0901384		125mL Plastic NP								
0901384		125mL Plastic NP								
20901384 20901384		125mL Plastic NP 125mL Plastic NP								
		: (include lab sample ID	numbers).			1	1			
ryhiain ai	ry discrepancies	. (menude iau sample ii)	Inditious (							
				•						

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0901384		
Project: JPL GW Mon 2Q09 / G486090				
Sample(s) received on: 04/22/09	Date opened: 04/22/09	by:	MZAMORA	

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	
P0901384-006.01	125mL Plastic NP					
			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			
			, , , , , , , , , , , , , , , , , , , ,			
	<u> </u>					
						***************************************

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

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Sample Matrix: WATER

Project Number: G486090

Service Request: P0901384

Date Collected: 04/22/09

Date Received: 04/22/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

Test Notes:

Sample Name	Lab Code	POL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
•		•	0.000	4	27.4	04/22/00 14 40	NID	
MW-22-5	P0901384-001	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-4	P0901384-002	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-3	P0901384-003	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-2	P0901384-004	0.010	0.003	1	NA	04/22/09 14:40	ND	
MW-22-1	P0901384-005	0.010	0.003	1	NA	04/22/09 14:40	ND	
EB-02-04/22/09	P0901384-006	0.010	0.003	1	NA	04/22/09 14:40	ND	
Method Blank	P0901384-MB	0.010	0.003	1	NA	04/22/09 14:40	ND	

Kau Rya Date: 10 Approved By

2655 Park Center Drive, Suite A

# CAS SR #P0901360

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Hexavalent Chromium Raw Data	14-24



## LABORATORY REPORT

April 22, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

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

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

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

Judeska

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of <u>24</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client: Project:

Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901360

# **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901360

# SAMPLE CROSS-REFERENCE

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

# 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.

# water & Juli - Chain of Custouy Record & Analytical Service Request

any Name & Address (I)  TELLE  O OLD TOWN  O OLD TOWN  TABLE  AVID CONNET  AVID CONNET  -14-5  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7  -14-7	Columbia Analytical	2655 Park Center Drive, Suite A Simi Valley California 93065	Drive, Suite A				;			5			
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# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Project:

JPL GW Mon 2Q09/G486090

Service Request: P0901360

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0901360-001.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-002.01					
	7196A				
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-003.01					
	7196A	4/21/00	1225	SMO / MZAMORA	
		4/21/09	1335		
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON P-37 / SANDERSON	
		4/21/09	1546	P-37/ SANDERSON	
P0901360-004.01					
	7196A	4/21/00	1225	CMO / MZ AMOD A	
		4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
P0901360-005.01					
	7196A	4/21/09	1335	SMO / MZAMORA	
		4/21/09	1336	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09	1546	P-37 / SANDERSON	
		7/21/09	1340	1 577 STATED LABOUR	
P0901360-006.01	71064				
	7196A	4/21/09	1335	SMO / MZAMORA	
		4/21/09	1335	P-37 / MZAMORA	
		4/21/09	1356	In Lab / SANDERSON	
		4/21/09 4/21/09	1336 1546	P-37 / SANDERSON	
		4/21/09	1340	I-3// SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client	: Battelle				_	Work order:	P0901360			
Project	: JPL GW Mor	1 2Q09 / G486090					w			
-	(s) received on			-	Date opened:		_ by:	MZAN		
		ll samples received by CAS								n of
compliance	e or nonconformity	. Thermal preservation and	l pH will only be	evaluated either a	it the request of t	the 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 c	lient sample II	)?			X		
2	-	supplied by CAS?	narkea wiai e	iront sumpro 11				$\boxtimes$		
3	` ,	ontainers arrive in go	od condition?					$\boxtimes$		
	-	of-custody provided?	ou continui.					$\boxtimes$		
4		or-custody provided: n-of-custody properly	completed9						$\boxtimes$	
5		ontainer labels and/o	_	ith oustody no	nora?			$\boxtimes$		
6	•				pers:			$\boxtimes$		
7	-	volume received adeq	-	315 (				$\boxtimes$		
8	-	within specified holding	_	- £ 1	المصموالة مسمط	4n 9		$\boxtimes$		
9		emperature (thermal)	preservation) (		=		°C		Ц	L
1.0		Cooler Temperature		°C Blank	Temperature	3	- '		$\boxtimes$	
10		ank received?						لسا		L
1.1	-	supplied by CAS:	nolow/Pow?				-		$\boxtimes$	
11	-	seals on outside of co	oner/box?				Cooling Lid?			$\boxtimes$
	Location of	, ,	<u> </u>				_Sealing Lid?			$\boxtimes$
	-	ure and date included	<b>!</b>							
	Were seals i									$\boxtimes$
		seals on outside of sa	mple containe	r?			a		$\boxtimes$	
	Location of	` '					_Sealing Lid?			$\boxtimes$
	-	ure and date included	?							$\boxtimes$
	Were seals i									$\boxtimes$
12		have appropriate pre		_		Client specified in	formation?	X		
	Is there a clie	nt indication that the s	submitted sam	ples are <b>pH</b> p	reserved?					$\boxtimes$
	Were <u>VOA v</u>	ials checked for prese	nce/absence o	f air bubbles?						$\times$
	Does the clien	nt/method/SOP requir	e that the anal	yst check the s	ample pH and	d if necessary al	ter it?			$\times$
13	Tubes:	Are the tubes cap	ped and intact	?						$\times$
		Do they contain n	noisture?							$\times$
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\times$
		Are dual bed bad	ges separated a	and individuall	ly capped and	l intact?				$\times$
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	t / Pres	ervation	
		Description	pH *	pН	рH	(Presence/Absence)		'ommer		
P090136	0-001 01	125mL Plastic NP					l			•
P090136		125mL Plastic NP						***************************************	***************************************	
P0901360		125mL Plastic NP							***************************************	
P0901360	0-004.01	125mL Plastic NP								
P0901360		125mL Plastic NP								
P0901360		125mL Plastic NP	•			L				
-	iny discrepancies Custody is missin	: (include lab sample ID	numbers):						<del></del>	
		the sample labels.					- the territory and the state of the state o		Marie Total Company and American Company	Perkana Mayori da Salah Andrews

<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** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Sample Matrix:

Project Number: G486090

WATER

Service Request: P0901360

**Date Collected:** 04/21/09

**Date Received:** 04/21/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

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

Karu Rya

Date:



# CAS SR #P0901783

# **Table of Contents**

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Heyayalent Chromium Raw Data	14-25



### LABORATORY REPORT

June 1, 2009

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

RE: JPL GW Mon 2Q09 / G486090

Dear David:

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

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains  $\frac{2}{2}$  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.

Judeste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of 25

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client: Project:

Battelle

JPL GW Mon 2Q09 / G486090

CAS Project No:

P0901783

# **CASE NARRATIVE**

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

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

**Project:** 

JPL GW Mon 2Q09/G486090

Service Request: P0901783

# SAMPLE CROSS-REFERENCE

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

# 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 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

Page 📗 of

Columbia Analytical Services\*\*\*

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

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 So were the HN03 NaOH Other 덕 Remarks ECUA) PARED CAS Project No. 0 က 4 ιΩ 9 CAS Contact 19 Time: 11' 3 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 0 J required Yes / No 0 MRL required Yes //No Semi-Volatile Organics GC/MS S25 □ 8270C □ (Subcontracted) 「PH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B (Subcontracted) 8015B 🗆 (Subcontracted) Oxygenates 🗆 □ 80928 TPH Gas □ **7**29 Volatile Organics GC/MS 3990 OLD TOWN AVE, C-205 SPL (AN MON 2008) SON KING BOOKING Number of Containers ch 4320 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) 6486090 PO. # / Billing Information 214319 / BATTELL Matrix STANK TO 3 Project Name Sampler (Print & Sign) Date Time
Collected Collected 5480 200 Company Name & Address (Reporting Information) 41/2 Laboratory ID Number SAU DECO, CA 92110 Email Address for Result Reporting Tier 1 - (Results/Default if not specified) DAVID CONNET Report Tier Levels - please select GR-726-7311 An Employee - Owned Company Tier II - (Results + QC) Project Manager Relinquished by (Sign Client Sample ID Q MW-ステー Phone

Cooler / Blank / Ice / No Ice

Timp

Received by: (Sign

Relinquished (Signature) Relinquished by: (Signature)

Temperature \_\_\_\_

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL GW Mon 2Q09/G486090

Service Request: P0901783

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

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle		Sample	Acceptanc	e Cneck Forn —	Work order:	P0901783			
		2Q09 / G486090			D 4	05/27/00	1	N 477 A N	AOD A	
	s) received on:	samples received by CAS.	Character of this forms	for matedy soon	Date opened:		by:	MZAN		
		Samples received by CAS.  Thermal preservation and pl							M OI	
оприансе (	or noncomormity.	rnemai preservation and pr	1 will only be evalu	illed outer at a	to request or and one	an and of as require	- 0, 4.0 1	Yes	<u>No</u>	N/A
1	Were sample	containers properly i	narked with cli	ent sample	ID?			X		
2	Container(s) s	upplied by CAS?						X		
3	Did sample co	ontainers arrive in go	ood condition?					X		
4	Was a chain-o	of-custody provided?						X		
5	Was the chain	-of-custody properly	completed?					$\times$		
6	Did sample co	ontainer labels and/o	r tags agree wi	th custody p	apers?			X		
7	Was sample v	olume received adequ	ıate for analysi	s?				X		
8	Are samples w	vithin specified holdin	ng times?					X		
9	Was proper te	mperature (thermal	preservation) o	f cooler at r	eceipt adhered	to?		X		
	C	Cooler Temperature,		°C Blank	Temperature	3	°C			
10	Was a trip bla	ank received?							X	
	Trip blank s	supplied by CAS:								
11	Were custody	seals on outside of co	ooler/Box?						X	
	Location of	seal(s)?					_ Sealing Lid?			$\overline{\mathbf{X}}$
	Were signat	ure and date included	.?							$\times$
	Were seals i	ntact?								X
	Were custody	seals on outside of sa	mple container	?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signature and date included?							$\boxtimes$		
	Were seals i									X
12		have appropriate pre				Client specified	information?	X		
	Is there a clie	ent indication that the	submitted sam	ples are <b>pH</b>	preserved?					$\boxtimes$
	Were <b>VOA</b> v	ials checked for prese	ence/absence of	air bubbles	?					X
	Does the clier	nt/method/SOP requir	e that the analy	yst check the	e sample pH ar	d if necessary	alter it?			X
13	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	properly capped	and intact?						$\times$
		Are dual bed bad	lges separated	and individu	ially capped an	d intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspa	ce Receip	it / Pres	ervatio	13
		Description	pH *	pH	pH	(Presence/Absenc	B)	Comme	nts	
P0901783	3-001.01	125mL Plastic NP						***************************************		
P0901783		125mL Plastic NP								
Explain a	ny discrepancies	s: (include lab sample II	) numbers):			<u> </u>				
-Apidin c	any ansoropanoros	(minima inc bumpio II								
		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								

<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** 

# COLUMBIA ANALYTICAL SERVICES, INC.

# Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 2Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0901783

Date Collected: 05/27/09 Date Received: 05/27/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

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-I	P0901783-001	0.010	0.003	1	NA	05/27/09 15:20	ND	
MW-9	P0901783-002	0.010	0.003	1	NA	05/27/09 15:20	ND	
Method Blank	P0901783-MB	0.010	0.003	1	NA	05/27/09 15:20	ND	

Date : Keett 05/28/09 Approved By

Report By:SAnderson