

CAS SR #P0802261

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LABORATORY REPORT

July 22, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 18, 2008. For your reference, these analyses have been assigned our service request number P0802261.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains apply 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. 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.

Arderson

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

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Client:

Battelle

CAS Project No:

P0802261

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 18, 2008 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802261

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0802261-001	MW-21-5	07/18/08	08:00
P0802261-002	MW-21-4	07/18/08	08:55
P0802261-003	MW-21-3	07/18/08	09:19
P0802261-004	MW-21-2	07/18/08	09:47
P0802261-005	MW-21-1	07/18/08	10:58
P0802261-006	EB-01-7/18/08	07/18/08	10:15

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 Hydro

TPH Total Petroleum Hydrocarbons
TSS Total Suspended Solids

TTLC Total Threshold Limit Concentration

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

Oualifiers

 $\label{eq:total_problem} U \qquad \qquad \text{The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.}$

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.

CAS Project No.

water & Soll - Chain of Custody Record & Analytical Service Request

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

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

Analytical Services mc.

Columbia

ui Employee - Owned Company

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

BUSWIC Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Other Remarks Cooler / Plank / ce / No Ice EDUIP. 0. 0 4 6 9 ~ CAS Contact EDD required/Yes// No, Analysis Method and/or Analytes Preservative Code d Yes No 0 \times × \times \times MRL required Yes ∕ No Semi-Volatile Organics GC/MS S25 🗆 8270C 🗆 (Subcontracted) TPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B □ (Subcontracted) TPH Diesel 8015B □ (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas 🗆 Redeived by: (5) TOMPHIM Number of Containers Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) JFL 64 Mar. 3008 4320 P.O. # / Billing Information -ところ ATTN: GERALD tolt Time: プル Timp! 3 I Matrix 0609849 Project Number 3 COLUMBUS Project Name Sampler (Print & Sign) THG Time Collected 1057 1015 S25 616 835 -Date, 1 Date Collected 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number 92110 X 7 CONNER Q Email Address for Result Reporting Tier 1 - (Results/Default if not specified) SPN DVEGO, CA X</8// Report Tier Levels - please select Relinquished by: (Signature) DAVED Relinquish on Shinature 118-54-731 Tier II - (Results + QC) BATTELLE 7-17-2 MW-21-5 Project Manager MV-71-4 MW-21-3 Client Sample ID MW-21 £6-01 Phone

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Temperature .

ત્રે⊌linguished⁻bỹ: (Signature)

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802261

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802261-001.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-002.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-003.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-004.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-005.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-006.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle					Work order:	P0802261			
Project:	JPL Groundw	ater Monitoring 3Q08	/ G486090							
	s) received on:				Date opened:		_ by:	LKUK		
		l samples received by CAS							indication	n of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	evaluated either at	the request of the	he client and/or as re	quired by the meth	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly n	narked with cl	ient sample ID	?			\times		
2	Container(s) s	supplied by CAS?			•			\times		
3	Did sample co	ontainers arrive in go	od condition?					\times		
4	Were chain-o	f-custody papers used	and filled out	?				\boxtimes		
5	Did sample co	ontainer labels and/or	tags agree wi	th custody pap	ers?			\times		
6	Was sample v	olume received adequ	ate for analys	is?				\times		
7	Are samples w	vithin specified holdin	g times?					\times		
8	=	mperature (thermal p		f cooler at rec	eipt adhered t	to?		\boxtimes		
	C	ooler Temperature		°C Blank T	emperature	3	_°C			
9	Was a trip bla									\boxtimes
	Trip blank s	upplied by CAS: Seria	ıl #		-TB		_			
10	Were custody	seals on outside of co	ooler/Box?						$\overline{\times}$	
	Location of	seal(s)?					_Sealing Lid?			\boxtimes
	Were signat	ure and date included:)							\times
	Were seals i	ntact?								X
	Were custody	seals on outside of sar	mple container	?					\times	
	Location of	seal(s)?					_Sealing Lid?			\times
	Were signat	ure and date included?)							\boxtimes
	Were seals i	ntact?								\times
11	Do containers	have appropriate pre	servation, acc	ording to meth	nod/SOP or C	Client specified in	nformation?	X		
	Is there a clie	nt indication that the s	ubmitted samp	ples are pH p	reserved?					\times
	Were VOA v	ials checked for prese	nce/absence of	f air bubbles?						X
	Does the clien	nt/method/SOP require	e that the analy	st check the s	ample pH and	d if necessary al	ter it?			X
12	Tubes:	Are the tubes cap	•		* *					X
		Do they contain n								\times
13	Badges:	Are the badges p	roperly capped	and intact?						\boxtimes
	9	Are dual bed badg			y capped and	intact?				\boxtimes
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervation	1
		Description	pΗ*	pН	pН	(Presence/Absence		Commer	its	
P0802261	-001.01	125mL Plastic NP								
P0802261		125mL Plastic NP								
P0802261		125mL Plastic NP								
P0802261		125mL Plastic NP								
P0802261		125mL Plastic NP								
P0802261	-000.01	125mL Plastic NP								
Evaloin	disawanan sisa	: (include lab sample II)	numbers):		Marian V		-	· · · · · · · · · · · · · · · · · · ·		

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Project Name:

Project Number: G486090

WATER

Sample Matrix:

JPL Groundwater Monitoring 3Q08

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

Basis: NA

Service Request: P0802261

Date Collected: 07/18/08

Date Received: 07/18/08

Camula Nama	Yah Cada	DOI.	MENT	Dilution	Date Extracted	Date/Time	D14	Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-21-5	P0802261-001	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-4	P0802261-002	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-3	P0802261-003	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-2	P0802261-004	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-1	P0802261-005	0.010	0.006	1	NA	07/18/08 13:05	ND	
EB-01-7/18/08	P0802261-006	0.010	0.006	1	NA	07/18/08 13:05	ND	
Method Blank	P0802261-MB	0.010	0.006	1	NA	07/18/08 13:05	ND	

Quelle Ke

Date :

QA/QC Report

Client: Project: Batelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802261 Date Analyzed: 7/18/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB	0.010	0.006	ND

Approved By:

ICCBMDL/120594

Date: 7/22/08

QA/QC Report

Client: Project:

Batelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802261

Date Analyzed: 7/18/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0406	97	90-110
CCV	0.0418	0.0430	103	90-110

Approved By:

CCV1A/120594

Jul Jules 1/23/08

11

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number:

G486090

WATER Sample Matrix:

Service Request:

P0802261

NA

Date Collected: Date Received:

NA

Date Extracted: NA

07/18/08

Date Analyzed:

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P0802261-LCS

Units:

mg/L (ppm)

Basis: NA

Test Notes:

CAS Percent Recovery Analysis Percent Acceptance Prep Result Method Method Limits Analyte True Value Result Recovery Notes

Chromium, Hexavalent

None

7196A

0.040

0.0422

106

92-113

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0802261

Date Collected: 07/18/08

Date Received: 07/18/08

Date Extracted: NA Date Analyzed: 07/18/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-21-5

P0802261-001MS

P0802261-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0568	0.0568	114	114	82-114	<1	



CAS SR #P0802271

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Hexavalent Chromium Raw Data	14-25



LABORATORY REPORT

July 22, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 21, 2008. For your reference, these analyses have been assigned our service request number P0802271.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains _____ 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. 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 Gerderke

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of *25*



Client:

Battelle

CAS Project No:

P0802271

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 21, 2008 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: P0802271

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE#	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	TIME
P0802271-001	MW-14-3	07/21/08	08:55
P0802271-002	MW-14-2	07/21/08	09:30
P0802271-003	MW-14-1	07/21/08	10:50
P0802271-004	DUPE-01-3Q08	07/21/08	00:00
P0802271-005	EB-02/7/21/08	07/21/08	10:40

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

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.

of Page __(

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

2655 Park Center Drive, Suite A

Columbia Analytical

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

Zn Acetate BLALL Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 DUPLICATION HN03 NaOH Remarks EDW/PHENT CAS Project No. 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 Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J required Yes / No 0 8270C □ (Subcontracted) Semi-Volatile Organics GC/MS TPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B

Cubcontracted) TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐ 8Se0B

Oxygenates Volatile Organics GC/MS 7808 DETWY CHEEDED TOMPKINS SOS KING DVE. Number of Containers Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) _____ COLLMBUS, OH 4320 P.O. # / Billing Information 0609815 Matrix Project Number 3 Project Name Sampler (Print & Sign) 040 Time Collected 77 2501 855 930 Date Collected 3990 OD TOWN AVE., C-205 Company Name & Address (Reporting Information) H Laboratory ID Number SAN DIEGO, CA 92110 G0 Email Address for Result Reporting Fier 1 - (Results/Default if not specified) D-16-01-30-58 Report Tier Levels - please select 6 DANA C An Employee - Owned Company BATTELLE 182-221-619 Fier II - (Results + QC) ~ Project Manager 7-Client Sample ID ガースア MN-17 エー・マズ Phone

No Ice

Cooler / Blank (loe!

Temperature

Received by: (Signature)

Relinquisher (Signature)

Received by: (Signature

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802271

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802271-001.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1723	P-37 / SANDERSON	
P0802271-002.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-003.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-004.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-005.01	07/21/2008	1232	SMO / MZAMORA	3444
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance	Check Form	Work order:	P0802271			
-		ater Monitoring 3Q08	/ G 486090							
Sample(s) received on:	7/21/08			Date opened:	7/21/08	_ by:	MZAN	10RA	
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 a										n of
compliance	or nonconformity.	Thermal preservation and	l pH will only be	evaluated either at	the request of the	he client and/or as req	uired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly n	narked with cl	ient sample ID	?			\times		
2	Container(s) s	upplied by CAS?						\times		
3	Did sample co	ontainers arrive in go	od condition?					\boxtimes		
4	Were chain-of	f-custody papers used	l and filled out	?				X		
5	Did sample co	ontainer labels and/or	r tags agree wi	ith custody par	ers?			\times		
6	Was sample v	olume received adequ	uate for analys	is?				\times		
7	Are samples w	vithin specified holdin	ig times?					\times		
8	Was proper te	mperature (thermal)	preservation) o	of cooler at rec	eipt adhered	to?		X		
		ooler Temperature	2		Temperature		_°C			
9	Was a trip bla	ink received?								\times
	Trip blank s	upplied by CAS: Seria	al#		-TB		_			
10	Were custody	seals on outside of co	ooler/Box?						\boxtimes	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signatu	are and date included:	?							X
	Were seals in	ntact?								\times
	Were custody	seals on outside of sa	mple containe	r?					X	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signatu	ure and date included:	?							\times
	Were seals in	ntact?								\times
11	Do containers	have appropriate pre	servation, acc	cording to meth	od/SOP or C	Client specified in:	formation?			\times
	Is there a clien	nt indication that the s	submitted samp	ples are pH p	reserved?					\times
	Were VOA v	ials checked for prese	nce/absence o	f air bubbles?						\boxtimes
	Does the clier	 nt/method/SOP require	e that the analy	vst check the sa	ample pH and	d if necessary alt	er it?			\boxtimes
12	Tubes:	Are the tubes cap	-	•	1 1					\boxtimes
		Do they contain n	noisture?							\times
13	Badges:	Are the badges p	roperly capped	d and intact?						\times
		Are dual bed badg	ges separated a	and individuall	y capped and	intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	
		Description	pH *	pН	pН	(Presence/Absence)		Commer	its	
P0802271	1-001.01	125mL Plastic NP								
P0802271		125mL Plastic NP								
P0802271-003.01 125mL Plastic NP										
P0802271		125mL Plastic NP								
P0802271	10.00-01	125mL Plastic NP								
Explain a	ny discrenancies	: (include lab sample ID	numbers).			Militaria de la composição de la composi				

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

Project Name:

WATER

Service Request: P0802271

Date Collected: 07/21/08

Date Received: 07/21/08

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-14-3	P0802271-001	0.01	0.006	1	NA	07/21/08 16:55	ND	
MW-14-2	P0802271-002	0.01	0.006	1	NA	07/21/08 16:55	ND	
MW-14-1	P0802271-003	0.01	0.006	1	NA	07/21/08 16:55	ND	
DUPE-01-3Q08	P0802271-004	0.01	0.006	1	NA	07/21/08 16:55	ND	
EB-02/7/21/08	P0802271-005	0.01	0.006	1	NA	07/21/08 16:55	ND	
Method Blank	P0802271-MB	0.01	0.006	1	NA	07/21/08 16:55	ND	

The Jules Date: 7/22/08

QA/QC Report

Client:BatelleService Request:P0802271Project:JPL Groundwater Monitoring 3Q08/G486090Date Analyzed:7/21/08

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB	0.010	0.006	ND

The Judester

Approved By:

ICCBMDL/120594

Date:

QA/QC Report

Client:BatelleService Request:P0802271Project:JPL Groundwater Monitoring 3Q08/G486090Date Analyzed:7/21/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0434	104	90-110
CCV	0.0418	0.0443	106	90-110

Approved By:

CCV1A/120594

ne Juderse Date:

QA/QC Report

Client:

Battelle

Service Request: P0802271

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: NA

Project Number :

G486090

Date Received: NA
Date Extracted: NA

Sample Matrix: WATER

Date Analyzed: 07/21/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Lab Code :

Laboratory Control Sample

Units: mg/L (ppm)

P0802271-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0405	101	92-113	

Approved By

She Juders

Data

12

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

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

Service Request: P0802271

Date Collected: 07/21/08

Date Received: 07/21/08

Date Extracted: NA

Date Analyzed: 07/21/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: MW-14-3

P0802271-001MS

P0802271-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code : Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.01	0.050	0.050	ND	0.0463	0.0463	93	93	82-114	<1	

Approved By

ne Judersh Date:

13



CAS SR #P0802320

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LABORATORY REPORT

July 31, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 23, 2008. For your reference, these analyses have been assigned our service request number P0802320.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 21 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. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Judestr

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>27</u>



Client:

Battelle

CAS Project No:

P0802320

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 23, 2008 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.

Battelle JPL Gro Service Request: P0802320 Client:

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0802320-001	MW-17-4	07/23/08	09:00
P0802320-002	MW-17-3	07/23/08	09:50
P0802320-003	MW-17-2	07/23/08	10:19
P0802320-004	DUPE-3-3Q08	07/23/08	00:00
P0802320-005	EB-04-7/23/08	07/23/08	10:07
P0802320-006	MW-18-4	07/23/08	12:00
P0802320-007	MW-18-3	07/23/08	12:29
P0802320-008	MW-18-2	07/23/08	13:15
P0802320-009	DUPE-4-3Q08	07/23/08	00:00

Columbia Analytical Services, Inc.

Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

DMS Duplicate Matrix Spike

DOH or DHS Department of Health Services

EPA U.S. Environmental Protection Agency

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

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

An Employee - Owned Company F	Phone (805) 526-7161 Fax (805) 526-7270	Reque 1 Day	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	Time in Busines 5%) 3 Day (50%)	ess Days (9 6) 4 Day (3	Surcharges) p 5%) 5 Day (29	s Days (Surcharges) please circle 4 Day (35%) 5 Day (25%) 10 Day - Standard	CAS Project No.	CC C C CC
					2 4	1 - 4 - 4 - 5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	A	CAS Contact	۱
Company Name & Address (Reporting Information)	eporting Information)	Project Name			Ana	ilysis Wethod	Analysis lilethod and/or Analytes		
BATELLE TOUR BIF	1-205	5PL 6W	MON 3016			Pre:	Preservative Code		Preservative Key 0 None
5770 OLD 10WN	-	Project Number			(pə	<u> </u>			
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Project Manager		P.O. # / Billing Info	ormation	(p		(.			
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Email Address for Result Reporting		Sampler (Print & Sign)		08 □ Oxi 0128 □ 180128 □] M2108 (75) 🗆 002			
Client Sample ID	Laboratory Date ID Number Collected	Time Matrix	Number of Containers	olatile Org 24 🗆 826 PH Gas 8 TEX 8021	PH Diesel				Remarks
4-11-WM	1 2/2/1/1	3		9 T 8 T	S L				
	۱.	_	•						
MW-17-3	2	950				×			
\$ T		(2) 5/0/							
1-11-MM	2	7504				×			
DUME- 3-3408	\ <u>\</u>					×			DUPLICATE
EB-04-7/23/28	\frac{1}{2}	/00/				X			FOULD BLANK
					<u> </u>	_			
Report Tier Levels - please select Tier I - (Results/Default if not specified)		Tier III - (Data Validation Package) 10% Surcharge) 10% Surcharge	MRL re	MRL required Yes ANo	9	EDD required Yes / No	Project Re	Project Requirements (MRLs, QAPP)
Her II - (Results + QC)		ient specified)	I Postore I	MIDL / I	OL / J requir	ed/Yes //No	Type: Cartal Ca		

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

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

	0	Remg	Rems	Rems	Remai	Rem R	Rem	Rem	P. Oth	Remarks Pub. Pub.	P. D. P. L. CAT		Remarks A D D L L CATO
31 ¹ 8 S	B	BTEX 8021B MTB TPH Diesel 8015B (Semi-Volatile Organica	BTEX 8021B	BTEX 8021B MTBI TPH Diesel 8015B (Sherel Low Level Semi-Volatile Organica 625 8270C (Sub	BTEX 8021B	BTEX 8021B	PTEX 8021B	TPH Diesel 8015M (St. Revel 10	BTEX 8021B MTBI TPH Diesel 8015B Con Level Semi-Volatile Organics Semi-Volatile Organics	BTEX 8021B	BTEX 8021B MTBI TPH Diesel 8015B Con Level TPH FC 8015M (Si Semi-Volatile Organics	BTEX 8021B	BTEX 8021B
х\дец С\W2	0 88 0	Number of Voltainers 624 Case Corporations Geven Case 80158 Case Case Case Case Case Case Case Case	O Coganics Granics Gr	Ordetile Organics G	Volatile Organics G Volatile Organics G Volatile Organics G TPH Gas 8015B	O colatile Organics © Colatile Organics © Colatile Organics □ 624 □ 6260 □ 626	Volatile Organics G Volatile Organics G Volatile Organics G TPH Gas 8015B	O colatile Organics © Volatile Organics © C □ R □ R □ R □ R □ R □ R □ R □ R □ R □	D soinge O Volatile Organics G	D soling O Organica O □ 80048 □ 426 □ B05408 □ 426 □ B05408 □ 426	O colatile Organics G	O coloridie Organics G	O coloride Organics G
commens of 43	rınt & Sign)	Matrix	Matrix	Matrix	Matrix 3-	Matrix 3	Matrix 3	Matrix 3	Matrix 3	Matrix	Matrix Matrix	Matrix Matrix	Matrix Matrix
9	Sampler (Print & Sign)	Sampler (Date Collected	Sampler (Date Collected	Sampler (Date Collected	Sampler (Date Collected Collected 7/23/8	Sampler Collected Collected	Sampler Collected	Sampler Collected	Sampler (Collected Collected	Sampler Collected	Sampler Collected Collected	Sampler Collected Collected	Date Collected Collected
) 	ail Address for Result Reporting	ail Address for Result Reporting In Sample ID In Number	Email Address for Result Reporting Client Sample ID Laborat ID Num	Address for Result Reportion ample ID	Address for Result Reporting ample ID 18-5-4	Address for Result Reporting ample ID 18-4 18-3	Address for Result Reporting ample ID 18-4 18-5	Address for Result Reporting 18 - 4 - 4 - 18 - 2	Address for Result Reporting ample ID 18-4 18-2 18-2 18-2	Address for Result Reportion ample ID 18-4 18-7 18-5 18-7 18-7 18-7 18-7 18-7 18-7	Address for Result Reporting Address for Result Reporting 18-4 18-4 18-4 18-7 18-7 18-7	Address for Result Reporting Address for Result Reporting 18-4 18-4 18-4 18-7 18-7	Address for Result Reporting Address for Result Reporting 18-4 18-4 18-4 18-7 18-7 18-7

Cooler/ Blank / Ice / No Ice

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

Client: Battelle

Project:

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802320

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802320-001.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-002.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-003.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-004.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-005.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-006.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-007.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-008.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-009.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle				_	Work order:	P0802320			
-		vater Monitoring 3Q0	8 / G486090		-					
	s) received on			_	Date opened:		by:	LKUK		
		ll samples received by CAS				_			indicatio	n of
compliance	or nonconformity	v. Thermal preservation and	d pH will only be	evaluated either a	t the request of t	he client and/or as re	quired by the meth		<u>No</u>	<u>N/A</u>
1	Were sample	containers properly:	marked with c	lient sample II)?			<u>Yes</u> ⊠		
2	_	supplied by CAS?			•			\boxtimes		
3		containers arrive in go	ood condition?					\boxtimes		
4	_	of-custody papers use						\boxtimes		
5		container labels and/o			pers?			\boxtimes		
6	_	volume received adeq						X		
7	_	within specified holding	•					X		
8	-	emperature (thermal	•	of cooler at rec	eipt adhered	to?		\boxtimes		
		Cooler Temperature	,		Γemperature	3	°C			
9	Was a trip bla	ank received?		-	ī		-			\boxtimes
	Trip blank s	supplied by CAS: Seri	al#		-TB					
10	Were custody	y seals on outside of c	ooler/Box?		_		-		\boxtimes	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signat	ture and date included	?							\boxtimes
	Were seals i	intact?								\times
	Were custody	seals on outside of sa	mple containe	r?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?				_			\boxtimes
	Were seals i	intact?								\boxtimes
11	Do containers	have appropriate pre	servation, acc	cording to metl	nod/SOP or C	lient specified in	formation?	X		
		nt indication that the		_		•				×
		ials checked for prese	-							\boxtimes
		nt/method/SOP requir			amnle nH and	if necessary als	tor it?			\boxtimes
12	Tubes:	Are the tubes cap			ampie pri and	i ii iiccessai y ai	ici it:			\boxtimes
		Do they contain r	_	•						X
13	Badges:	Are the badges p		1 and intact?						\boxtimes
		Are dual bed bad			v capped and	intact?				\boxtimes
l ak C	iample ID	Container	Required	Received	Adjusted	VOA Hendspace				
Lanc	minhie 10	Description	pH *	pH	Aujusieu pH	(Presence/Absence)		t / Prese Jommen		
20802320	-001-01	125mL Plastic NP								
P0802320		125mL Plastic NP								
P0802320		125mL Plastic NP	<u> </u>							
P0802320	-004.01	125mL Plastic NP								
P0802320		125mL Plastic NP								
P0802320		125mL Plastic NP								
P0802320		125mL Plastic NP								
Explain ar	ny discrepancies	: (include lab sample ID	numbers):							

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0802320		
Project: JPL Groundwater Monitoring 3Q08 / G486090				
Sample(s) received on: 7/23/08	Date opened: 7/23/08	hv·	LKUKITA	

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	
	Description	pH *	pН	pH	(Presence/Absence)	Comments
P0802320-008.01	125mL Plastic NP					
P0802320-009.01	125mL Plastic NP					
			0			
					,	
						70-0
**						

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802320

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 07/23/08

Project Number: G486090

Sample Matrix:

WATER

Date Received: 07/23/08

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-17-4	P0802320-001	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-17-3	P0802320-002	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-17-2	P0802320-003	0.010	0.006	1	NA	07/23/08 17:14	ND	
DUPE-3-3Q08	P0802320-004	0.010	0.006	1	NA	07/23/08 17:14	ND	
EB-04-7/23/08	P0802320-005	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-4	P0802320-006	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-3	P0802320-007	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-2	P0802320-008	0.010	0.006	1	NA	07/23/08 17:14	ND	
DUPE-4-3Q08	P0802320-009	0.010	0.006	1	NA	07/23/08 17:14	ND	
Method Blank	P0802320-MB	0.010	0.006	1	NA	07/23/08 17:14	ND	

QA/QC Report

Client:

Batelle

Service Request: P0802320

Project:

JPL Groundwater Monitoring 3Q08/G486090

Date Analyzed: 7/23/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Approved By:

ICCBMDL/120594

In Jule 1/31/08

QA/QC Report

Client: Project:

Batelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802320

Date Analyzed: 7/23/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0380	91	90-110
CCV1	0.0418	0.0398	95	90-110
CCV2	0.0418	0.0407	97	90-110

Approved By:

CCV1A/120594

Sue Aulers Date: 7/31/08

QA/QC Report

Client:

Battelle

JPL Groundwater Monitoring 3Q08

Service Request: P0802320

Project Name: **Project Number:**

G486090

Date Collected: NA Date Received: NA

Sample Matrix: WATER Date Extracted: NA Date Analyzed: 07/23/08

Laboratory Control Sample Summary **Inorganic Parameters**

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802320-LCS

Basis: NA

Test Notes:

						CAS		
				Percent				
						Recovery		
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes	
Chromium, Hexavalent	None	7196A	0.040	0.0415	104	92-113		

Sul Jules Date: 7/31/08

Report By: DCastillo

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix: WATER

Service Request: P0802320 **Date Collected:** 07/23/08 Date Received: 07/23/08 Date Extracted: NA

Date Analyzed: 07/23/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: MW-17-4

P0802320-001MS

P0802320-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result	_ ^	oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0476	0.0485	95	97	82-114	2	

Sul Juleth Date: 7/31/08 15

Report By:DCastillo



CAS SR #P0802352

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Sample Acceptance Check Form
Hexavalent Chromium Analytical Data
Hexavalent Chromium Raw Data14-2



LABORATORY REPORT

August 4, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 25, 2008. For your reference, these analyses have been assigned our service request number P0802352.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

Julesta

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>*85*</u>



Client:

Battelle

CAS Project No:

P0802352

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 25, 2008 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: P0802352

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0802352-001	MW-20-5	07/25/08	07:47
P0802352-002	MW-20-4	07/25/08	08:26
P0802352-003	MW-20-3	07/25/08	08:56
P0802352-004	MW-20-2	07/25/08	09:23
P0802352-005	MW-20-1	07/25/08	09:50
P0802352-006	EB-05-7/25/08	07/25/08	09:38

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

TTLC

TSS Total Suspended Solids

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).

Total Threshold Limit Concentration

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

Zn Acetate DUP. BLANK Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key A HN03 NaOH Other Remarks 15051 CAS Project No. CAS Contact Type: (SCFAM: 1/1/L 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 Analysis Method and/or Analytes Preservative Code MRL required Yes / No / MDL / POL / J required Yes / No 2 × Semi-Volatile Organics GC/MS 625 🗆 8270C 🗅 (Subcontracted) TPH FC □ 8015M (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) □ 83108 as HqT Volatile Organics GC/MS 624 □ 8260B □ Oxygenates □ 300% Number of Containers NTTO: CEELALD TOMPHINS Tier III - (Data Validation Package) 10% Surcharge SOS KINIA AVE. P.O. # / Billing Information JPL GW NON to 6098757 Matrix COLUMBIA Project Number # 214319 Project Name Sampler (Print & Sign) Tier V - (client specified) Date Time Collected Collected 147 856 278 056 876 276 15/63 Company Name & Address (Reporting Information) 3990 OLD FOUND AVE, C-205 Laboratory ID Number SAN DIEGO, CA 92110 Email Address for Result Reporting Fier 1 - (Results/Default if not specified) DAVID COUNTER 80/51/1 -50-Report Tier Levels - please select Columbia Analytical Services NC 1152-222-619 4n Employee - Owned Company Fier II - (Results + QC) -20-7 BATTELLE 4-07-4 Project Manager NW-20-3 ١ Relinquished by (Sto) Client Sample ID MW-72 MW-20 Phone Z

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Received by: (Signature

Times o

Relinguishe (Signature) Relinquished by: (Signature)

Time:

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802352

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802352-001.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-002.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-003.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-004.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-005.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-006.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Project PL Groundwater Monitoring 3 Q08 / G4486090 Date opened: 7/25/08 by: LXUKITA	Client:	Battelle		Sampi	e Acceptance	Check Form	Work order:	P0802352			
Date open: 725:08 Date			ater Monitoring 3008	/ G486090		•		1000000			-
This form is used fire The inform is used fire It is semple a received by CAS. The use of this form for embedy sends is strictly meant to indicate presence/absence and not an indication of complex or moneconformity. Themsel preservetion and pit will only be evaluated either at the request of the slient analyse are equived by the methods/SOP. 1. Were sample containers properly marked with client sample ID? 2. Container(s) supplied by CAS? 3. Did sample containers arrive in good condition? 4. Were chain-of-custody papers used and filled out? 5. Did sample container labels and/or tags agree with custody papers? 6. Was sample volume received adequate for analysis? 7. Are samples within specified holding times? 8. Was proper temperature (thermal preservation) of cooler at receipt adhered to? 6. Was sample counter cocked as a many servation of cooler at receipt adhered to? 7. Cooler Temperature 8. Was proper temperature (thermal preservation) of cooler at receipt adhered to? 8. Was proper temperature (thermal preservation) of cooler at receipt adhered to? 9. Were custody seals on outside of cooler/Box? 10. Were custody seals on outside of cooler/Box? 11. Do container? 12. Container of seal(s)? 13. Were signature and date included? 14. Were seals intact? 15. Sealing Lid? 16. Were seals intact? 17. Were existed as a container and the submitted samples are plt preserved? 18. Were signature and date included? 19. Were signature and date included? 20. Were seals intact? 21. Tubes: Are the tubes capped and intact? 22. Does the cilen/method/SOP require that the analyst check the sample pH and inforcessary after it? 23. Sealing Lid? 24. Tubes: Are the tubes capped and intact? 25. Do the cilen/method/SOP require that the analyst check the sample pH and inforcessary after it? 26. Sealing Lid? 27. Tubes: Are the tubes capped and intact? 28. Are the badges separated and individually capped and intact? 39. Sealing Lid? 30.	-			7 0 100000		Date opened:	7/25/08	by:	LKUK	ITA	
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P0802352-002.01			Description	pH *	pН	pН	(Presence/Absence)	Comme	its	
P0802352-003.01	P0802352	2-001.01	125mL Plastic NP								
P0802352-004.01	P0802352	2-002.01	125mL Plastic NP								
P0802352-005.01			125mL Plastic NP								
P0802352-006.01											
Evalain any disamanajasy (inalyda lah samula ID nymhara).	1 0002332	000.01	123THE Plastic NP								
Explain any discrepancies: (include lab sample ID numbers):	Explain a	ny discrepancies	: (include lab sample ID	numbers):		(<u> </u>	

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802352

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 07/25/08

Project Number: G486090

Date Received: 07/25/08

Sample Matrix: WATER

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-20-5	P0802352-001	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-4	P0802352-002	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-3	P0802352-003	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-2	P0802352-004	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-1	P0802352-005	0.010	0.006	1	NA	07/25/08 14:25	ND	
EB-05-7/25/08	P0802352-006	0.010	0.006	1	NA	07/25/08 14:25	ND	
Method Blank	P0802352-MB	0.010	0.006	1	NA	07/25/08 14:25	ND	

She Julest Date: 8/4/08 9

Report By:NFallahi

QA/QC Report

Client:

Battelle

Service Request: P0802352

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 7/25/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

adem

Date:

Approved By:

ICCBMDL/120594

QA/QC Report

Client:BattelleService Request:P0802352Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:7/25/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Le Juleste

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

	True		Percent
Sample Name	Value	Result	Recovery
ICV	0.0418	0.0402	96
CCV1	0.0418	0.0393	94

Approved By:

CCV1A/120594

Date:

QA/QC Report

Client: Battelle Service Request: P0802352

Project Name :JPL Groundwater Monitoring 3Q08Date Collected :NAProject Number :G486090Date Received :NASample Matrix :WATERDate Extracted :NADate Analyzed :07/25/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm)

Lab Code: P0802352-LCS Basis: NA

Test Notes:

Analyte

CAS

Percent

Recovery

Prep Analysis

Method Method True Value Result Recovery

Limits Notes

Chromium, Hexavalent None 7196A 0.040 0.0383 96 92-113

Approved By

The SudeM Date:

12

QA/QC Report

Client:

Project Name:

Sample Matrix:

Battelle

JPL Groundwater Monitoring 3Q08

Project Number: G486090

WATER

Service Request: P0802352

Date Collected: 07/25/08 Date Received: 07/25/08

Date Extracted: NA

Date Analyzed: 07/25/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-20-4

P0802352-002MS

P0802352-002DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0470	0.0470	94	94	82-114	<1	

Approved By



CAS SR #P0802370

Simi Valley, California 93065

Table of Contents

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Sample Acceptance Check Form	8-9
Hexavalent Chromium Analytical Data	10-15
Hexavalent Chromium Raw Data	16-27



LABORATORY REPORT

Simi Valley, California 93065

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 28, 2008. For your reference, these analyses have been assigned our service request number P0802370.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

(Juderse

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager



Client:

Battelle

CAS Project No:

P0802370

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Simi Valley, California 93065

CASE NARRATIVE

The samples were received intact under chain of custody on July 28, 2008 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: P0802370

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
P0802370-001	MW-3-4	07/28/08	11:12
P0802370-002	MW-3-3	07/28/08	11:59
P0802370-003	MW-3-2	07/28/08	12:28
P0802370-004	MW-4-3	07/28/08	08:23
P0802370-005	MW-4-2	07/28/08	09:15
P0802370-006	MW-4-1	07/28/08	09:50
P0802370-007	DUPE-5-3Q08	07/28/08	00:00
P0802370-008	EB-06-7/28/08	07/28/08	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

Page of I

Columbia
Analytical
Services Mc.
An Employee - Owned Company

2655 Park Center Drive, Suite A 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

						_		An	Analysis Method and/or Analytes	ethod a	nd/or An	alytes) 	סאט טעט וומכוי	
Company Name & Address (Reporting Information)	eporting Infor	mation)	Project Name	ame									Translation			2
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							osel	litelo	728						<u></u>	PRINCE PROPERTY AND DESCRIPTION OF STREET, STR
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers		TPH Di	V-im92	© 229							Remarks
MW-3-4		128/00	1112	3	# 2	0			X						7	4/MSD
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Report Tier Levels - please select									<u> </u>					Proj	ect Require	Project Requirements (MRLs, QAPP)
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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

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) DUPU CATE COULD. BLANK H2S04 Preservative Key NaOH HN03 Other 건 Remarks Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard Analysis Method and/or Analytes Preservative Code MRL required Yes (No MDL / PQL / J required Yes) No C Semi-Volatile Organics GC/MS 625 □ 8270C □ (Subcontracted) TPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ □ sətsnəgyxO □ 806s8 Number of Containers COLUMBUS, Off 4320 MTN. CEEDLD TOMPKINS 505 KIND AVE. Tier III - (Data Validation Package) 10% Surcharge. Tier V - (client specified) 3008 2143R/BATTELE JPL GW MON Matrix 0609875 3 Project Number Project Name Sampler (Print & Sign) Date Time
Collected Collected 0873 5/60 0360 0/160 V2868 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Fax (805) 526-7270 Laboratory ID Number SAN DIEGO, CA 92110 CONNET **Email Address for Result Reporting** Fier 1 - (Results/Default if not specified) Report Tier Levels - please select -3008 90/87 Columbia Analytical Services MC. 619-726-7311 un Employee - Owned Company Fier II - (Results + QC) AIRA 4-3 Project Manager 'n Client Sample ID ソーケーググ 3-9-アンナー DUPE. ANTI

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

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Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802370

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802370-001.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-001.02	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-002.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-003.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-004.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-005.01	07/28/2008	1418	SMO / LKUKITA	****
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-006.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-007.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-008.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle			e Acceptance		Work order:	P0802370			
		ater Monitoring 3Q08	/ G486090		D 4 1	7/20/00	1	T TZT IIZ	T/D A	
	s) received on:		771 C.11:	•	Date opened:	· · · · · · · · · · · · · · · · · · ·	_ by:	LKUK		
		samples received by CAS							indication	n oI
compilance	or nonconformity.	Thermal preservation and	ph will only be	evaluated either a	t the request of the	e chem and/or as red	duited by the meth	Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly n	narked with cl	ient sample ID)?			X		
2	Container(s) s	upplied by CAS?						\times		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Were chain-of	f-custody papers used	and filled out	?				\times		
5	Did sample co	ontainer labels and/or	tags agree wi	th custody par	ers?			\times		
6	Was sample v	olume received adequ	ate for analys	is?				X		
7	Are samples w	ithin specified holdin	g times?					\boxtimes		
8	Was proper te	mperature (thermal p	oreservation) o	of cooler at rec	eipt adhered to	?		X		
	C	ooler Temperature		°C Blank	Γemperature _	3	_°C			
9	Was a trip bla	nk received?								X
	Trip blank sı	upplied by CAS: Seria	ıl #		-TB		_			
10	Were custody	seals on outside of co	ooler/Box?						\times	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signatu	are and date included?)							X
	Were seals in	ntact?								X
	Were custody	seals on outside of sar	mple containe	:?					X	
	Location of	seal(s)?					Sealing Lid?			X
	-	are and date included?)							\boxtimes
	Were seals in									\boxtimes
11		have appropriate pre		_		ient specified in	formation?	\times		
		nt indication that the s	•		reserved?					\boxtimes
	Were VOA vi	ials checked for prese	nce/absence of	f air bubbles?						\boxtimes
	Does the clien	t/method/SOP require	e that the analy	st check the s	ample pH and	if necessary all	ter it?			\times
12	Tubes:	Are the tubes cap	ped and intact	?						\times
		Do they contain n	noisture?							X
13	Badges:	Are the badges p	roperly capped	1 and intact?						\times
		Are dual bed badg	ges separated a	nd individuall	y capped and	intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	ı
		Description	pH*	pН	pН	(Presence/Absence)	('ommei	its	
P0802370	0-001.01	125mL Plastic NP								
P0802370		125mL Plastic NP								
P0802370		125mL Plastic NP								
P0802370 P0802370		125mL Plastic NP								
P0802370 P0802370		125mL Plastic NP 125mL Plastic NP								
P0802370		125mL Plastic NP								
Explain a	ny discrepancies	(include lab sample ID	numbers):							

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0802370	
Project: JPL Groundwater Monitoring 3Q08 / G486090			
Sample(s) received on: 7/28/08	Date opened: 7/28/08	by:	LKUKITA

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receipt / Preservation
-F	Description	pH *	pН	pН	(Presence/Absence)	Comments
P0802370-007.01	125mL Plastic NP					
P0802370-008.01	125mL Plastic NP					
				<u> </u>		
				i		

_	_					

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802370

Project Name: Project Number: G486090

JPL Groundwater Monitoring 3Q08

Date Collected: 07/28/08

Sample Matrix:

WATER

Date Received: 07/28/08

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-3-4	P0802370-001	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-3-3	P0802370-002	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-3-2	P0802370-003	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-3	P0802370-004	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-2	P0802370-005	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-1	P0802370-006	0.010	0.006	1	NA	07/28/08 17:15	ND	
DUPE-5-3Q08	P0802370-007	0.010	0.006	1	NA	07/28/08 17:15	ND	
EB-06-7/28/08	P0802370-008	0.010	0.006	1	NA	07/28/08 17:15	ND	
Method Blank	P0802370-MB	0.010	0.006	1	NA	07/28/08 17:15	ND	

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802370 Date Analyzed: 7/28/08

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Title: Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Approved By:

ICCBMDL/120594

Sue Juderso Date: 8/8/08

QA/QC Report

The Jules 18/8/08

Client:BattelleService Request:P0802370Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:7/28/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0446	107
CCV1	0.0418	0.0404	97
CCV2	0.0418	0.0404	97

Approved By:

CCV1A/120594

QA/QC Report

Service Request: P0802370 Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08 Date Collected: NA Date Received: Project Number: G486090 NA Sample Matrix: WATER Date Extracted: NA Date Analyzed: 07/28/08

> Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm)

P0802370-LCS Lab Code: Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0375	94	92-113	

Report By:NFallahi

QA/QC Report

Client:

Battelle

Project Name:

Project Number: G486090 Sample Matrix:

WATER

JPL Groundwater Monitoring 3Q08

Date Collected: 07/28/08 Date Received: 07/28/08

Service Request: P0802370

Date Extracted: NA

Date Analyzed: 07/28/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-3-4

P0802370-001MS

P0802370-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0425	0.0460	85	92	82-114	8	



CAS SR #P0802384

Table of Contents

Cover Letter	
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LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 29, 2008. For your reference, these analyses have been assigned our service request number P0802384.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

Columbia Analytical Services, Inc.

ne Juderser

Sue Anderson Project Manager

> Page 1 of 26



Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

CAS Project No:

P0802384

CASE NARRATIVE

The samples were received intact under chain of custody on July 29, 2008 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: P0802384

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0802384-001	MW-23-4	07/29/08	07:56
P0802384-002	MW-23-3	07/29/08	08:45
P0802384-003	MW-23-2	07/29/08	09:34
P0802384-004	MW-23-1	07/29/08	10:01
P0802384-005	EB-07-07/29/08	07/29/08	09:24

Columbia Analytical Services, Inc.

Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

DMS Duplicate Matrix Spike

DOH or DHS Department of Health Services

EPA U.S. Environmental Protection Agency

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

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

M Modified Method

MDL Method Detection Limit

MRL Method Reporting Limit

MS Matrix Spike

MTBE Methyl tert-Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppb Parts Per Billionppm Parts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

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

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

Columbia Analytical

NW75 Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Other Remarks EGUYPHENT 12/145\ IJ 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 6 \times X X × 8270C 🗆 (Subcontracted) SM/OB constile Organics GC/MS TPH FC □ 8015M (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) BTEX 8021B Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ ATTU: GETEALD TOMPHAINS 505 KINGA AVE. Number of Containers 3008 COLLUMBUS, OF 43201 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) P.O. # / Billing Information # 2,143/9 GE NOW. 0609825 Matrix 3 Project Number Project Name Sampler (Print & Sign) Date Time Collected Collected 076 3845 934 9924 1001 B Company Name & Address (Reporting Information) 3990 OLD POWN AVE, C-205 27 Laboratory ID Number SAN DIELO, CA 92110 GNNER Email Address for Result Reporting Tier 1 - (Results/Default if not specified) 90 Report Tier Levels - please select 1182-972-619 An Employee - Owned Company 10, SS SE Fier II - (Results + QC) 3DFTELLE -23-4 Project Manager MW-23-2 Client Sample ID Mw-23-MW-23-EB-07 Ž

Ice NNo Ice

Cooler / Blank

Received by: (Signature

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0802384

Project: JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On		
P0802384-001.01	07/29/2008	1336	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			
P0802384-002.01	07/29/2008	1336	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			
P0802384-002.02	07/29/2008	1337	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			
P0802384-003.01	07/29/2008	1336	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			
P0802384-004.01	07/29/2008	1336	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			
P0802384-005.01	07/29/2008	1336	SMO / LKUKITA			
	07/29/2008	1349	In Lab / NFALLAHI			
	07/29/2008	1717	P-37 / DCASTILLO			

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle		p		_	Work order:	P0802384			
		ater Monitoring 3Q08	/ G486090			= (0.0 (0.0				
	s) received on:			•	Date opened:		by:	LKUK		
		l samples received by CAS							indicatio	n of
compliance	or nonconformity.	. Thermal preservation and	ph will only be	evaluated either a	it the request of t	ne chem and/or as r	equired by the metr	Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly r	narked with cl	ient sample II)?			$\overline{\mathbb{X}}$		
2	-	supplied by CAS?		1				X		
3		ontainers arrive in go	od condition?					X		
4	Were chain-o	f-custody papers used	and filled out	t?				X		
5	Did sample co	ontainer labels and/or	r tags agree wi	ith custody pa	pers?			\boxtimes		
6	Was sample v	volume received adequ	aate for analys	sis?				X		
7	Are samples w	vithin specified holdin	g times?					X		
8	Was proper te	emperature (thermal p	preservation) o	of cooler at rec	eipt adhered	to?		\times		
	C	Cooler Temperature		°C Blank	Temperature	3	°C			
9	Was a trip bla	ank received?								X
	Trip blank s	upplied by CAS: Seria	al #		-TB		_			
10	Were custody	seals on outside of co	ooler/Box?						\times	
	Location of	seal(s)?					_Sealing Lid?			\boxtimes
	Were signatu	ure and date included	?							\boxtimes
	Were seals i	ntact?								X
	Were custody	seals on outside of sa	mple containe	r?					\times	
	Location of	seal(s)?					_Sealing Lid?			\boxtimes
	Were signatu	ure and date included	?							\boxtimes
	Were seals is	ntact?								\boxtimes
11	Do containers	have appropriate pre	servation, acc	cording to met	hod/SOP or C	Client specified in	nformation?			\times
	Is there a clie	nt indication that the s	submitted sam	ples are pH p	reserved?					X
	Were VOA v	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clier	nt/method/SOP require	e that the anal	yst check the s	ample pH an	d <u>if necessary</u> a	lter it?			\boxtimes
12	Tubes:	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							\boxtimes
13	Badges:	Are the badges p	roperly cappe	d and intact?						\times
		Are dual bed badg			ly capped and	I intact?				\times
Lah	Sample ID	Container	Required	Received	Adjusted	VOA Hendspac	e Receir	ot / Prese	ervation	
	r	Description	pH *	pН	pН	(Presence/Absence		Commen		
P0802384	L-001 01	125mL Plastic NP					1			
P0802384		125mL Plastic NP								
P0802384	-002.02	125mL Plastic NP								
P0802384		125mL Plastic NP								
P0802384		125mL Plastic NP								
P0802384	-005.01	125mL Plastic NP								
Explain	ny discrenancies	: (include lab sample ID	numbers).	<u> </u>		1				J
~~prum a	, amoropanoios	. (

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Service Request: P0802384

Project Name : JPL Groundwater Monitoring 3Q08 **Project Number :** G486090 **Date Collected:** 07/29/08 **Date Received:** 07/29/08

Sample Matrix: WATER

Chromium, Hexavalent

Prep Method: None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-4	P0802384-001	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-3	P0802384-002	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-2	P0802384-003	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-1	P0802384-004	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
EB-07-07/29/08	P0802384-005	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
Method Blank	P0802384-MB	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	

Approved By

Date

Q

QA/QC Report

Client:BattelleService Request:P0802384Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:7/29/08

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

Approved By: ICCBMDL/120594

10

QA/QC Report

Client:

Battelle

Service Request: P0802384

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 7/29/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Sue Julers

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0402	96
CCV1	0.0418	0.0433	94

Approved By:

CCV1A/120594

QA/QC Report

Client:

Battelle

Service Request : P0802384

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: NA

Project Number:

G486090

Date Received: NA

Sample Matrix: WATER

Date Extracted: 07/29/08 07/29/08 Date Analyzed:

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802384-LCS

Basis: NA

Test Notes:

						CAS		
						Percent		
						Recovery		
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes	
Chromium, Hexavalent	None	7196A	0.040	0.0402	101	92-113		

ne Juleste Date:

QA/QC Report

Client: Battelle

Project Name: Project Number: G486090

JPL Groundwater Monitoring 3Q08 WATER

Date Collected: 07/29/08 Date Received: 07/29/08 Date Extracted: 07/29/08 Date Analyzed: 07/29/08

Service Request: P0802384

Matrix Spike/Duplicate Matrix Spike Summary

P0802384-002DMS

Sample Name: MW-23-3

P0802384-002MS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Sample Matrix:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes	
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0464	0.0464	93	93	82-114			

ne Julerte Date: 8/8/08



CAS SR #P0802406

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LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 30, 2008. For your reference, these analyses have been assigned our service request number P0802406.

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. 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.

Julest

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>*2*9</u>



Client:

Battelle

CAS Project No:

P0802406

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 30, 2008 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: P0802406 Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0802406-001	MW-11-3	07/30/08	11:57
P0802406-002	MW-11-2	07/30/08	12:37
P0802406-003	MW-11-1	07/30/08	13:34
P0802406-004	MW-22-3	07/30/08	08:02
P0802406-005	MW-22-2	07/30/08	08:35
P0802406-006	MW-22-1	07/30/08	09:16
P0802406-007	EB-08-07/30/08	07/30/08	08:59

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 Lof

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

2655 Park Center Drive, Suite A

Columbia Analytical

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

Preservative Key CAS Confact 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 Project Name Company Name & Address (Reporting Information) An Employee - Owned Company

Zn Acetate Asc Acid H Project Requirements (MRLs, QAPP) H2S04 HN03 NaOH Remarks वित १९१६ ooley/ Blank //ce //No Ice 45N/2D emperature Time: 4 > 7 MRL required Yes (No MDL / PQL / J required Yes / No 0 \rightarrow × Semi-Volatile Organics GC/MS 625 🗆 8270C 🗅 (Subcontracted) TPH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) □ 81208 X∃T8 Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas Received by: (Signat MON 380 Number of Containers ATTIL: GERRED TOMPKINS Tier III - (Data Validation Package) 10% Surcharg columbus, of 4320 P.O. # / Billing Information スノ43 (9 / BATTELLE 505 KING AVE. 2000 SPU GE Matrix 0426090 Project Number 3 Sampler (Print & Sign) 20/02/20 1237 Tier V - (client specified) Time Collected 1.51 1334 Date Collected 07/39/08 30/08 30/05/10 3990 OID TOWN AVE, C-205 6 Laboratory ID Number SAX DIEGO, CA ZHIO Email Address for Result Reporting Tier 1 - (Results/Default if not specified) CONNER Report Tier Levels - please select Fier II - (Results + QC) Project Manager MW-11-2 DAVA Client Sample ID Mw-11-MW-11-Relinquished MA Relinquist

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

2655 Park Center Drive, Suite A

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

Zn Acetate Asc Acid eaughest BLANK Project Requirements (MRLs, QAPP) A H2S04 Preservative Key HN03 NaOH Remarks SC LEVEL J2X/22 CAS Contact 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 Analysis Method and/or Analytes Preservative Code Type: MINT APOL / J required (es/No MRL required Yes KNo Semi-Volatile Organics GC/MS 625 🗆 8270C 🗀 (Subcontracted) TPH FC [8015M (Subcontracted) TPH Diesel 8015B (Subcontracted) Volatile Organics GC/MS 624 □ 8260B □ Oxygena Oxygenates 🗆 TPH Gas B ATTW: CHERALD TOMPKINS 3008 Number of Containers Tier III - (Data Validation Package) 10% Surcharge COLUMBUS, OH 4320, SOS KING AVE. P.O. # / Billing Information GW NON. Matrix 0609.84.5 Project Number Project Name Sampler (Print & Sign) Tier V - (client specified) Time Collected 7080 2880 125 6580 9/60 Date Collected B Company Name & Address (Reporting Information) 3990 OLD TOWN AVE, C-205 8 Laboratory ID Number SAN DIEGO, CA 92110 のととが Email Address for Result Reporting Tier 1 - (Results/Default if not specified) Report Tier Levels - please select 118-726-7311 Columbia Analytical Services nc. GINDA An Employee - Owned Company 0 Fier II - (Results + QC) SATTELLE 4-11-VM Project Manager MW-22-Client Sample ID MW-22 1-814

Received by: (Signature)

Relinquened

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Service Request: P0802406

Project: JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On		
P0802406-001.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1638	P-37 / DCASTILLO			
P0802406-002.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1639	P-37 / DCASTILLO			
P0802406-002.02	07/30/2008	1521	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1638	P-37 / DCASTILLO			
P0802406-003.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1638	P-37 / DCASTILLO			
P0802406-004.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1639	P-37 / DCASTILLO			
P0802406-005.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1639	P-37 / DCASTILLO			
P0802406-006.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1638	P-37 / DCASTILLO			
P0802406-006.02	07/30/2008	1521	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1639	P-37 / DCASTILLO			
P0802406-007.01	07/30/2008	1517	SMO / LKUKITA			
	07/30/2008	1527	In Lab / DCASTILLO			
	07/30/2008	1639	P-37 / DCASTILLO			

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Project TPL Groundwater Monitoring 30(8) / G486099 Dute opened: 7/30/08 by: LKUKITA		Battelle		- Sumpi		-	Work order:	P0802406			
This form is used for all samples received by CAS. The use of this form for canded yearly is chickly accurate indicate presentation and pli will only be evaluated either at the request of the client and/or as required by the unthor8507. 1 Were sample containers properly marked with client sample ID? 2 Container(s) supplied by CAS? 3 Did sample containers arrive in good condition? 4 Were chain-of-custody papers used and filled out? 5 Did sample containers arrive in good condition? 6 Wars sample within specified holding times? 7 Are samples within specified holding times? 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? Cooler Temperature Cooler Temperature Cooler Temperature Cooler Trip blank supplied by CAS: Serial B Were estandy seals on outside of cooler/Box? Location of seal(s)? Were signature and date included? Do ontainers have appropriate preservation, according to method/SOP or Client specified information? Solution of seal(s)? Tubes: Are the tubes capped and intact? Are the badges spoparty capped and intact? Are the badges s	-			/ G486090							
Were sample containers properly marked with client sample ID?		·				•		_			
Were sample containers properly marked with client sample ID?			=							ndication	n of
Were sample containers properly marked with client sample ID?	compliance	or nonconformity.	Thermal preservation and	pH will only be	evaluated either a	t the request of the	he client and/or as re	quired by the meth		<u>No</u>	<u>N/A</u>
Did sample containers arrive in good condition? Were chain-of-custody papers used and filled out? Did sample container labels and/or tags agree with custody papers? Was sample volume received adequate for analysis? Are samples within specified holding times? Was proper temperature (thermal preservation) of cooler at receipt adhered to? Cooler Temperature "C Blank Temperature 3	1	Were sample	containers properly n	narked with cl	ient sample ID)?					
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Was proper temperature (thermal preservation) of cooler at receipt adhered to?	6	Was sample v	olume received adequ	ate for analys	is?				X		
Cooler Temperature	7	Are samples w	ithin specified holdin	g times?					\times		
Sealing Lid? Seal	8	Was proper te	mperature (thermal p	oreservation) o	of cooler at rec	eipt adhered	to?		X		
Trip blank supplied by CAS: Scrial #			-		°C Blank	Γemperature	3	_°C			
10 Were custody seals on outside of cooler/Box?	9	-									\boxtimes
Location of seal(s)?		-				-TB			_		_
Were seals intact?	10	-		ooler/Box?							
Were seals intact?			* *	***************************************				_Sealing Lid?			
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12 Tubes: Are the tubes capped and intact?		Were VOA v	ials checked for prese	nce/absence of	f air bubbles?						\times
Do they contain moisture?		Does the clier	nt/method/SOP require	e that the analy	st check the s	ample pH and	d if necessary al	ter it?			\times
13 Badges: Are the badges properly capped and intact?	12	Tubes:	Are the tubes cap	ped and intact	?						\times
Container Required PH PH PH PH PH PH PH P			Do they contain n	noisture?							\times
Lab Sample ID Container Description Required pH * Received pH Adjusted pH VOA Headspace (Presence/Absence) Receipt / Preservation Comments P0802406-001.01 125mL Plastic NP	13	Badges:	Are the badges p	roperly capped	l and intact?						\boxtimes
Description pH pH pH (Presence/Absence) Comments P0802406-001.01 125mL Plastic NP			Are dual bed badg	ges separated a	nd individuall	y capped and	l intact?				\boxtimes
Description pH pH pH (Presence/Absence) Comments P0802406-001.01 125mL Plastic NP	Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Hendspace	Receip	t / Pres	ervation	
P0802406-002.01			Description	pH *	рH	pН	(Presence/Absence)	('ommer	its	
P0802406-002.02	P0802406	-001.01	125mL Plastic NP								
P0802406-003.01			125mL Plastic NP								
P0802406-004.01											
P0802406-005.01						· <u>·</u>		<u> </u>			
P0802406-006.01								 			
								-			
				numbere).		I					

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0802406	
Project: JPL Groundwater Monitoring 3Q08 / G486090			
Sample(s) received on: 7/30/08	Date opened: <u>7/30/08</u>	by:	LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802406-006.02	125mL Plastic NP					
P0802406-007.01	125mL Plastic NP					
			••••			
			····			

		·				

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix: WATER **Service Request:** P0802406 **Date Collected:** 07/30/08 **Date Received:** 07/30/08

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-11-3	P0802406-001	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-11-2	P0802406-002	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-11-1	P0802406-003	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-3	P0802406-004	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-2	P0802406-005	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-1	P0802406-006	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
EB-08-07/30/08	P0802406-007	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
Method Blank	P0802406-MB	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	

Approved By Sul Judish Date: 8/8/08 11

Report By:NFallahi

QA/QC Report

Client:BattelleService Request:P0802406Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:7/30/08

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Approved By: ICCBMDL/120594

Que Oudern

QA/QC Report

Client:BattelleService Request:P0802406Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:7/30/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

	True		Percent
Sample Name	Value	Result	Recovery
- 4			
ICV	0.0418	0.0443	106
CCV1	0.0418	0.0436	104
CCV2	0.0418	0.0417	100

Approved By:

CCV1A/120594

The Juder St. 2/8/08

13

QA/QC Report

Client:

Project Name:

Battelle

Service Request: P0802406

JPL Groundwater Monitoring 3Q08

Date Collected: Date Received:

NA

G486090 Project Number: Sample Matrix: WATER

Date Extracted:

NA 07/30/08

Date Analyzed: 07/30/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units:

mg/L (ppm)

Lab Code:

P0802406-LCS

Basis: NA

Test Notes:

						Percent	
Analyte	Prep Method	Analysis Method	True Value	Result		Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0383	96	92-113	

Approved By

She Juderso

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

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

Service Request: P0802406
Date Collected: 07/30/08
Date Received: 07/30/08
Date Extracted: 07/30/08

Date Analyzed: 07/30/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-11-2

Lab Code: P08024

P0802406-002MS

P0802406-002DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result		Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0470	0.0483	94	97	82-114	3	

Approved By

The Judest Date:

45

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix: WATER

Service Request: P0802406 Date Collected: 7/30/2008 **Date Received:** 7/30/2008 Date Extracted: 07/30/08

Date Analyzed: 07/30/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-22-1

Lab Code:

P0802406-006MS

P0802406-006DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	POL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
			- 2						1.20	21.10	Limits	Difference	
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0489	0.0476	98	95	82-114	3	

Approved By

Tue Juder 1 Date: 8/8/08



CAS SR #P0802421

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LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 31, 2008. For your reference, these analyses have been assigned our service request number P0802421.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

he audersa

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of 45



Client:

Battelle

CAS Project No:

P0802421

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Simi Valley, California 93065

CASE NARRATIVE

The samples were received intact under chain of custody on July 31, 2008 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: P0802421

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	<u>TIME</u>
P0802421-001	MW-12-3	07/31/08	08:08
P0802421-002	MW-12-2	07/31/08	08:33
P0802421-003	MW-12-1	07/31/08	09:23
P0802421-004	DUPE-7-3Q08	07/31/08	00:00
P0802421-005	EB-09-7/31/08	07/31/08	09:12

Columbia Analytical Services, Inc.

Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

DMS Duplicate Matrix Spike

DOH or DHS Department of Health Services

EPA U.S. Environmental Protection Agency

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

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

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

Columbia Analytical

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

Zn Acetate FOUIL BLANK Asc Acid Project Requirements (MRLs, QAPP) DUPLICATE Preservative Key H2S04 HN03 NaOH Other 건 Remarks No Ice 8 က 4 50 O N CAS Project No. / Blank CAS Contact 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 Analysis Method and/or Analytes Preservative Code O X MRL required/Yes (No. J requirec 8270C 🗆 (Subcontracted) SM/OB soinganie Organics GC/MS LPH FC 🗆 8015M (Subcontracted) MDL POR PH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B □ (Subcontracted) C24 ☐ 8260B ☐ Oxygenates ☐ TPH Gas Received by: (Signati Volatile Organics GC/MS SPL GW MON 3808 COLUNBUS, OH 43201 ATTN: GERALD TOMPKINS 505 KING AVE Number of Containers Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) P.O. # / Billing Information 06098tm Time: 133 Matrix 16035 1X Project Number Project Name Sampler (Print & Sign) ્રેન્ Time Collected 808 45 923 833 SEE Date Collected 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number OCT 8 \$0.000 0.0000 0.00 SAN DIEGO, CA 92110 Email Address for Result Reporting ier 1 - (Results/Default if not specified) Fax 7/3/108 -300g-Report Tier Levels - please select DAVID CONNER 6/9-726-7311 Relinquished by (Signature) An Employee - Owned Company Relinquished by: (Signature) Relinquished by: (Signatuhe Tier II - (Results, 4 QC) BATTELLE -50 Project Manager Nw-12-2 MW-12-3 MW-12-Client Sample ID ì D 0 0 € EB-1

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Service Request: P0802421

Project: JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802421-001.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-002.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
P0802421-003.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-004.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-005.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1318	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Project PIC Groundwater Monitoring 3008 / G486099 Date opened: 7/31/98 by: LKUKITA		Battelle			ne Acceptance	-	Work order:	P0802421			
This form is used for all samples received by CAS. The use of this form for castody seals is strictly usual to indicate protence/absence and not as an indication of compliance or non-onformity. Thereal preservation and plt will only be evaluated either at the request of the client auditor as required by the method/SOP. Were sample containers properly marked with client sample ID?		THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED		3 / G486090		*****	**				
Were sample containers properly marked with client sample ID? Section	• •	·				•					
Were sample containers properly marked with client sample IDP							_			indícatio	n of
Were sample containers properly marked with client sample ID?	compliance	or nonconformity	7. Thermal preservation and	d pH will only be	evaluated either a	t the request of t	he client and/or as re	equired by the meth		No	N/A
Container(s) supplied by CAS?	1	Were sample	containers properly:	marked with c	lient sample II)?					
Did sample containers arrive in good condition?		_									
Did sample container labels and/or tags agree with custody papers?				ood condition?							
Are sample within specified holding times?	4	Were chain-o	of-custody papers use	d and filled ou	t?				\boxtimes		
Are samples within specified holding times? Was proper temperature (thermal preservation) of cooler at receipt adhered to? Cooler Temperature PC Blank Temperature 3 PC 9 Was a trip blank received? Trip blank supplied by CAS: Serial # -TB 10 Were custody seals on outside of cooler/Box? Location of seal(s)? Were seals intact? Were seals intact? Were supstature and date included? Were signature and date included? Were signature and date included? Were signature and date included? Were seals intact? Bootation of seal(s)? Were signature and date included? Were seals intact? Were special intact? Sealing Lid? Do containers have appropriate preservation, according to method/SOP or Client specified information? Is there a client indication that the submitted samples are pH preserved? Were YOA vials checked for presence/absence of air bubbles? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Tubes: Are the tubes capped and intact? Do they contain moisture? Do they contain moisture? Are the badges properly capped and intact? Do they contain moisture? Are dual bed badges separated and individually capped and intact? Description PH PH (Presecul Absence) Comments P0802421-002.01 125mL Plastic NP P0802421-003.01 125mL Plastic NP	5	Did sample c	container labels and/o	r tags agree w	ith custody par	pers?			\times		
Was proper temperature (thermal preservation) of cooler at receipt adhered to? Cooler Temperature Trip blank supplied by CAS: Serial # -TB 10 Were custody seals on outside of cooler/Box? Location of seal(s)? Were signature and date included? Were seals intact? Cocation of seal(s)? Were custody seals on outside of sample container? Location of seal(s)? Were seals intact? Sealing Lid? COOLER TEMPERATURE Sealing Lid? COOLER TEMPERATURE COOLER TEMPERATURE COOLER TEMPERATURE Sealing Lid? COOLER TEMPERATURE Sealing Lid? COOLER TEMPERATURE COOLER TEMPERATURE Sealing Lid? COOLER TEMPERATURE COOLER TEMPERATURE Sealing Lid? COOLER TEMPER	6	Was sample	volume received adeq	uate for analys	sis?	•			X		
Variable Cooler Temperature O'C Blank Temperature 3 O'C	7	Are samples v	within specified holding	ng times?					X		
Sealing Lid? Seal	8	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		\times		
Trip blank supplied by CAS: Serial # -TB Were custody seals on outside of cooler/Box?		(Cooler Temperature		°C Blank	Гетрегаture	3	°C			
Location of seal(s)? Sealing Lid? Sealing Lid	9	Was a trip bl	ank received?		-						X
Location of seal(s)? Sealing Lid?		Trip blank s	supplied by CAS: Seri	al#		-TB		_			
Were signature and date included?	10	Were custody	y seals on outside of c	ooler/Box?						\times	
Were seals intact?		Location of	`seal(s)?					Sealing Lid?			\times
Were custody seals on outside of sample container?		Were signat	ture and date included	?							\times
Location of seal(s)? Sealing Lid?		Were seals i	intact?								\boxtimes
Were signature and date included? Were seals intact? Do containers have appropriate preservation, according to method/SOP or Client specified information? Do containers have appropriate preservation, according to method/SOP or Client specified information? Do containers have appropriate preservation, according to method/SOP or Client specified information? Do containers have appropriate preservation according to method/SOP or Client specified information? Do containers have appropriate preserved? Do containers have appropriate preserved? Do containers have appropriate preserved? Do container have been accorded and intact? Do they contain moisture? Do they contained have been added and intact? Do they contained have been added and individually capped and intact? Do they contained have been accorded and individually capped and intact? Do they contained have been accorded have been accorded and individually capped and intact? Do they contained have been accorded		Were custody	seals on outside of sa	mple containe	r?					\times	
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11 Do containers have appropriate preservation, according to method/SOP or Client specified information?		-		?							\times
Is there a client indication that the submitted samples are pH preserved? Were VOA vials checked for presence/absence of air bubbles? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Does the c		Were seals i	intact?								\times
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Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? Tubes: Are the tubes capped and intact? Do they contain moisture? Do they contain moisture? Are the badges properly capped and intact? Are dual bed badges separated and individually capped and intact? Are dual bed badges separated and individually capped and intact? Container Required Received Adjusted PH (Presence/Absence) Description PH PH PH PH PH PH PH (Presence/Absence) P0802421-001.01 125mL Plastic NP P0802421-003.01 125mL Plastic NP P0802421-004.01 125mL Plastic NP P0802421-005.01 125mL P0802421-		Is there a clie	ent indication that the	submitted sam	ples are pH p	reserved?					\times
Tubes: Are the tubes capped and intact?		Were VOA v	<u>rials</u> checked for prese	ence/absence o	f air bubbles?						\times
Do they contain moisture? Are the badges properly capped and intact? Are dual bed badges separated and individually capped and intact? Container Description P0802421-001.01 125mL Plastic NP P0802421-003.01 125mL Plastic NP P0802421-004.01 125mL Plastic NP P0802421-005.01 125mL Plastic NP P0802421-005.01 125mL Plastic NP P0802421-005.01 125mL Plastic NP		Does the clie	nt/method/SOP requir	e that the anal	yst check the s	ample pH and	d <u>if necessary</u> al	lter it?			\times
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Lab Sample ID Container Description Required pH * Received pH * Adjusted pH (Presence/Absence) VOA Headspace (Presence/Absence) Receipt / Preservation Comments P0802421-001.01 125mL Plastic NP <td>13</td> <td>Badges:</td> <td>Are the badges p</td> <td>roperly cappe</td> <td>d and intact?</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>\times</td>	13	Badges:	Are the badges p	roperly cappe	d and intact?						\times
Description pH * pH pH (Presence/Absence) Comments			Are dual bed bad	ges separated a	and individuall	y capped and	intact?				\times
Description pH * pH pH (Presence/Absence) Comments	Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervation	
P0802421-002.01			Description	pH *	pН	рH					
P0802421-003.01	P0802421	-001.01	125mL Plastic NP								
P0802421-004.01			125mL Plastic NP								
P0802421-005.01 125mL Plastic NP											
											
Explain any discrepancies: (include lab sample ID numbers):	FU8UZ4Z1	-005.01	125mL Plastic NP				,				
Explain any discrepancies: (include lab sample ID numbers):											
	Explain ar	ny discrepancies	s: (include lab sample ID	numbers):							

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802421

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 07/31/08

Project Number: G486090 Sample Matrix:

WATER

Date Received: 07/31/08

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-3	P0802421-001	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
MW-12-2	P0802421-002	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
MW-12-1	P0802421-003	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
DUPE-7-3Q08	P0802421-004	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
EB-09-7/31/08	P0802421-005	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
Method Blank	P0802421-MB	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	

9

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802421

Date Analyzed: 7/31/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

The Judest Date: 8/

Approved By:

ICCBMDL/120594

QA/QC Report

Client: Battelle Service Request: P0802421

Project: JPL Groundwater Monitoring 3Q08 / G486090 Date Analyzed: 7/31/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0404	97
CCV1	0.0418	0.0379	91

The Judestr

Approved By:

CCV1A/120594

QA/QC Report

Client: Battelle **Service Request:** P0802421 JPL Groundwater Monitoring 3Q08 Date Collected: **Project Name:** NA **Project Number:** G486090 Date Received: NA Sample Matrix: WATER Date Extracted: 07/31/08

07/31/08 Date Analyzed:

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm) Lab Code: P0802421-LCS

Basis: NA

Test Notes:

CAS Percent Recovery Analysis Acceptance Prep Percent Result Method Method Limits Analyte True Value Result Recovery Notes Chromium, Hexavalent None 7196A 0.040 0.0388 97 92-113

he Jeulesh

Report By:NFallahi

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0802421 Date Collected: 07/31/08 Date Received: 07/31/08

Date Extracted: 07/31/08 Date Analyzed: 07/31/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-12-3

Lab Code:

P0802421-001MS

P0802421-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0539	0.0554	108	111	82-114	3	

he Juliah



CAS SR #P0802448

Simi Valley, California 93065

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LABORATORY REPORT

August 12, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 1, 2008. For your reference, these analyses have been assigned our service request number P0802448.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains &4 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. 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.

Oudern-

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager



Client:

Battelle

CAS Project No:

P0802448

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 1, 2008 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: P0802448

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
P0802448-001	MW-25-5	08/01/08	07:51
P0802448-002	MW-25-4	08/01/08	08:24
P0802448-003	MW-25-3	08/01/08	08:54
P0802448-004	MW-25-2	08/01/08	09:47
P0802448-005	MW-25-1	08/01/08	10:18
P0802448-006	EB-10-8/1/08	08/01/08	10:02

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.

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

Columbia Analytical Services Mc.

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

An Employee - Owned Company Fax (805)	Phone (805) 526-7161 Fax (805) 526-7270	Re → □	Requested Turn 1 Day (100%) 2	rnaround Tim 2 Day (75%)	e in Busines: 3 Day (50%)	s Days (Surch 4 Day (35%)	ırcharges) pl %) 5 Day (25	arges) please circle 5 Day (25%) 10 Day - Standard	CAS	Project No.	みかかく
						Analy	sis Method	Analysis Method and/or Analytes	CAS	CAS Contact:	X
Company Name & Address (Reporting Information)	Information)	Project Name									
27731 (25	1			1			Pres	Preservative Code		Prese	Preservative Key
3990 OLD TOWN PVE, C-205	E, C-205	Project Number	202	300%	(0			0	None
SONDIEGO CA 92	92110	10000	5					· · · · · · · · · · · · · · · · · · ·	de constant	- ·	HCL HNO3
	•	6486	060						W elm a	1 (7	H2SO4
Project Manager	(P.O. # / Billing Information	Information		eq)	(p				0 4	NaOH
DIVING CONNET	EZ	17/1/2/1	۲ ۲	WINGLIAT	3 🗆 trac	9	(90			2	Zn Acetate
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619-726-7311		COLUMBUS, Off 4370	1,50 x		genati)9 sc	<u>-</u>				Other
Email Address for Result Reporting	Sampler	Sampler (Print & Sign)			045B□ 045B□ 08□		ユ				
	······································			neg.	801 81 91 E	əlit	C				
Client Sample ID ID Number	atory Date mber Collected	Time	Matrix	Number of tile Containers	524 □ 82 PH Gâs PEX 802 PH Diese	sse □ 8s emi-Aola PH FC	つ			<u>~</u>	Remarks
MW-25-5	8/1/06	75/	3	-	L L L	3	×				
MW-25-4		824		1			×				
											The state of the s
MW-25-3 3		458		7			×			MS/M	8
MW-25-7	,	647		7			×				
MW-25-1	•	1018		_			×				
EB-12-8/1/28 6		700/		1			X			EOUP	P. BLOWE
, and the state of											
Report Tier Levels - please select									Proj	Project Requirements (MRLs, QAPP)	MRLs, QAPP)
Tier 1 - (Results/Default if not specified)	Tier III - (D) Tier V - (clie	Tier III - (Data Validation Package) 10% Surcharge, Tier V - (client specified)	çage) 10% Su ≟	urcharge	MBL / BOL / Jrequired Yes / Mo	dres / No	1 Yes / Mo	EDD required Yes, No Type:			ELECTRICAL OF COM-

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802448

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802448-001.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1215	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-002.01	08/01/2008	1155	SMO / LKUKITA	,
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-003.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1215	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-003.02	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
P0802448-004.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-005.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-006.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

~			Sampi	e Acceptance	Check Form		D0002440			
	Battelle	utan Manitanin a 2008	/ C496000		•	Work order:	P0802448			
	s) received on:	ater Monitoring 3Q08	7 0480090	, , , , , , , , , , , , , , , , , , , ,	Date opened:	8/1/08	by:	LKUK	ΙΤΔ	
• •	*	samples received by CAS	The use of this t		_	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	•			n of
		Thermal preservation and							indioacio i	
compilance	or noncomorning.	Thermal preservation and	pri am vinj sv		7			<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly n	narked with cl	ient sample ID	?			X		
2	Container(s) s	upplied by CAS?						\boxtimes		
3	Did sample co	ontainers arrive in go	od condition?					\boxtimes		
4	Were chain-of	f-custody papers used	and filled out	?				X		
5	Did sample co	ontainer labels and/or	tags agree wi	th custody pap	ers?			\times		
6	Was sample v	olume received adequ	ate for analys	is?				\times		
7	Are samples w	rithin specified holdin	g times?					\times		
8	Was proper te	mperature (thermal p	oreservation) o	f cooler at rec	eipt adhered t	to?		X		
	C	ooler Temperature		°C Blank 7	Temperature	3	°C			
9	Was a trip bla	nk received?								\times
	Trip blank s	applied by CAS: Seria	ıl #		-TB					
10	Were custody	seals on outside of co	ooler/Box?						\times	
	Location of	seal(s)?					Sealing Lid?			X
	Were signatu	are and date included:)							\times
	Were seals in	ntact?								\times
	Were custody	seals on outside of sar	mple container	?					\times	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signatu	are and date included:)							\times
	Were seals in	ntact?								\times
11	Do containers	have appropriate pre	servation, acc	ording to metl	nod/SOP or C	lient specified in	formation?	\times		
	Is there a clien	nt indication that the s	ubmitted samp	oles are pH p	reserved?					\times
	Were VOA v	ials checked for prese	nce/absence of	f air bubbles?						\times
		nt/method/SOP require			ample pH and	d if necessary alt	ter it?			\times
12	Tubes:	Are the tubes cap			1 1					X
		Do they contain n	•							X
13	Badges:	Are the badges p		I and intact?						\boxtimes
	g	Are dual bed badg			y capped and	intact?				\boxtimes
1.3.0	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Parair	r / Dres	ervation	
Laux	sample 11)	Description	pH *	рН	рН	(Presence/Absence)		Commei		
P0802448	001.01	125mL Plastic NP								
P0802448		125mL Plastic NP					,			
P0802448		125mL Plastic NP								
P0802448		125mL Plastic NP								
P0802448		125mL Plastic NP								
P0802448 P0802448		125mL Plastic NP								
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		125mL Plastic NP								
Explain a	ny discrepancies	: (include lab sample ID	numbers):							

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Project Name:

Service Request: P0802448 JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix: WATER

Date Collected: 08/01/08 Date Received: 08/01/08

Chromium, Hexavalent

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

Basis: NA Analysis Method: 7196A

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-25-5	P0802448-001	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-4	P0802448-002	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-3	P0802448-003	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-2	P0802448-004	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-1	P0802448-005	0.010	0.006	1	NA	08/01/08 14:50	ND	
EB-10-8/1/08	P0802448-006	0.010	0.006	1	NA	08/01/08 14:50	ND	
Method Blank	P0802448-MB	0.010	0.006	1	NA	08/01/08 14:50	ND	

The Juleston Date:

QA/QC Report

Client:

Battelle

Service Request: P0802448

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 8/1/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Sue Juderser

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

Approved By:

ICCBMDL/120594

QA/QC Report

Client:BattelleService Request:P0802448Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:8/1/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0395	94
CCV1	0.0418	0.0416	100

Approved By: CCV1A/120594

Sul Julestr Date: 8/11/08

QA/QC Report

Client:

Battelle

P0802448

Project Name:

JPL Groundwater Monitoring 3Q08

Service Request: Date Collected: NA

Project Number:

G486090

Date Received: NA Date Extracted : NA

Sample Matrix:

WATER

Date Analyzed: 08/01/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802448-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
	Prep	Analysis			Percent	Acceptance	Result
Analyte	Method	Method	True Value	Result	Recovery	Limits	Notes
Chromium, Hexavalent	None	7196A	0.040	0.0405	101	92-113	

Se Jule M Date:

Report By:NFallahi

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

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

Service Request: P0802448
Date Collected: 08/01/08
Date Received: 08/01/08
Date Extracted: NA
Date Analyzed: 08/01/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name: Lab Code: MW-25-3

P0802448-003MS

P0802448-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0513	0.0546	103	109	82-114	6	

Approved By

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Date

13

Report By:NFallahi



CAS SR #P0802472

Simi Valley, California 93065

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Hexavalent Chromium Raw Data	17-27



LABORATORY REPORT

August 14, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 4, 2008. For your reference, these analyses have been assigned our service request number P0802472.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 122 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. 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.

holosta

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager



Client:

Battelle

CAS Project No:

P0802472

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 4, 2008 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: P0802472

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0802472-001	MW-24-4	08/04/08	08:11
P0802472-002	MW-24-3	08/04/08	08:41
P0802472-003	MW-24-2	08/04/08	09:10
P0802472-004	MW-24-1	08/04/08	09:52
P0802472-005	EB-11-08/04/08	08/04/08	09:30
P0802472-006	MW-26-2	08/04/08	11:30
P0802472-007	MW-26-1	08/04/08	12:05

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.

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

SAM S Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 Other CAS Project No. PCSO2472 HCL Remarks Caypuel M5/M5D CAS Contact Time: [4] EDD required Yes) No Type: GCO HAULE 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 MPL / PQL / J required Yes //No 0 \times × TPH FC 🗆 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ Received Ay: (Sighardine) Volatile Organics 624 ☐ 8260B ☐ Oxygenates □ ATTU: CERALY TOMPHINS SOF KING AVE. Number of Containers GW MON. 3008 Tier III - (Data Validation Package) 10% Surdharge. Tier V - (client specified) COLUMBUS, Off 43201 P.O. # / Billing Information Time: 500 0601849 Matrix Project Number Project Name Sampler (Print & Sign) 035/24/as Date Time Collected Collected 1360 326 0450 0/2 1/30 80 1280 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number B 4 6 92110 AVID COUNCE Email Address for Result Reporting Tier 1 - (Results/Default if not specified) SAN DIEGO, CA Report Tier Levels - please select Columbia Analytical Services INC. 619-726-7311 An Employee - Owned Company BOTTELLE Fier II - (Results + QC) 180 7-Project Manager Mw-24-2 Mw-24-3 MV-24-1 Client Sample ID 74 43-14 3 Phone

emperature _

Cooler

Freeze

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

nquished by: (Signatu

Page of

POSU 2477

CAS Project No

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

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

Columbia Analytical

An Employee - Owned Company

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

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 HN03 NaOH Remarks 0 0 10 CAS Contact: Type: GONAGUA 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 Analysis Method and/or Analytes Preservative Code MDL / POL / J required Yes /No MRL required Yes //No Semi-Volatile Organics GC/MS 625 □ 8270C □ (Subcontracted) TPH FC ☐ 8015M (Subcontracted) TPH Diesel Low Level 8015B □ (Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ □ S260B □ Oxygenates □ Volatile Organics GC/MS ATTY: GERBLO TOMPHINS Number of Containers 3008 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) SOS KING NE. to 376 GW NOW. 060925 Matrix Sampler (Print & Sign) Project Number Project Name Collected 120% Date Collected 3990 OLD TOWN NUE, C-205 Company Name & Address (Reporting Information) 0/126 Laboratory ID Number 9 DAVE COUNTER Email Address for Result Reporting SON DIEGO,CA Fier 1 - (Results/Default if not specified) Report Tier Levels - please select Phone - 726 - 73// BOTTELLE Fier II - (Results + QC) Project Manager MW-26-Client Sample ID リアーグル

er / Blank //Ice / No Ice

Time:

emperature

Received by: (Signature)

Relinquished by: (Signature

Time: 30 of

Date: (4 / 68

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802472

Bottle ID	Date		Sample Location / User	Disposed On		
P0802472-001.01	08/04/2008	1402	SMO / MZAMORA			
	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-002.01	08/04/2008	1402	SMO / MZAMORA			
	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-003.01	08/04/2008	1402	SMO / MZAMORA			
	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-004.01	08/04/2008	1402	SMO / MZAMORA			
•	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-004.02	08/04/2008	1402	SMO / MZAMORA			
	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/14/2008	1122	P-37 / LKUKITA			
P0802472-005.01	08/04/2008	1402	SMO / MZAMORA			
	08/04/2008	1404	P-39 / MZAMORA			
	08/04/2008	1436	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-006.01	08/04/2008	1422	SMO / MZAMORA			
	08/04/2008	1434	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			
P0802472-007.01	08/04/2008	1422	SMO / MZAMORA			
	08/04/2008	1435	In Lab / NFALLAHI			
	08/04/2008	1658	P0802472-004.02 / NFALLAHI			

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Sampi	e Acceptance		Work order:	P0802472			
		ater Monitoring 3Q08	/ G486090		-					
Sample(s) received on:	8/4/08			Date opened:	8/4/08	by:	MZAN	10RA	
Note: This	form is used for all	samples received by CAS	. The use of this	form for custody	seals is strictly me	eant to indicate prese	ence/absence and r	not as an	indication	n of
compliance	or nonconformity.	Thermal preservation and	l pH will only be	evaluated either a	t the request of th	e client and/or as req	juired by the meth		NIo	NI/A
	337	4 . *	المطابات المصادما	iont gammlo ID	.			<u>Yes</u> ⊠	<u>No</u> □	<u>N/A</u>
1	-	containers properly r	narked with ci	iem sampie il)			\boxtimes		
2		upplied by CAS?	1							
3	_	ontainers arrive in go						\boxtimes		
4		f-custody papers used						\boxtimes		
5	-	ontainer labels and/o			pers?			\boxtimes		
6	_	olume received adequ		is?				\boxtimes		
7	Are samples w	ithin specified holding	g times?					\boxtimes		
8	Was proper te	mperature (thermal p	preservation) o	of cooler at rec	eipt adhered to	ο?		\times		
	C	ooler Temperature		°C Blank	Femperature _	2	°C			
9	Was a trip bla	ink received?								\times
	Trip blank s	upplied by CAS: Seria	al#	-	-TB		-			
10	Were custody	seals on outside of co	ooler/Box?						\times	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signate	ure and date included	?							\boxtimes
	Were seals i	ntact?								\times
	Were custody	seals on outside of sa	mple containe	r?					\times	
	Location of	seal(s)?					Sealing Lid?			\boxtimes
		are and date included	?				-			\boxtimes
	Were seals i									\boxtimes
11		have appropriate pre	servation, acc	ording to metl	hod/SOP or Cl	lient specified in	formation?	\times		
- 1		nt indication that the s				•				X
		ials checked for prese	_							\boxtimes
		nt/method/SOP requir			ample pH and	if necessary alt	or it?			\boxtimes
1.2	Tubes:	Are the tubes cap			ашрте ртт ана	ii iiccessary an	Ci it:			X
12	Tubes.			•						\boxtimes
	.	Do they contain n		1 1 1 1 10						
13	Badges:	Are the badges p								\boxtimes
		Are dual bed bad	ges separated a	ind individuali	y capped and	intact?	100000000000000000000000000000000000000			X
Lab	Sample ID	Container	Required	Received		VOA Headspace			ervation	
		Description	pH*	pН	pН	(Presence/Absence)	('ommer	its	
P0802472	2-001.01	125mL Plastic NP								
P0802472		125mL Plastic NP								
P0802472		125mL Plastic NP							 	
P0802472		125mL Plastic NP								
P0802472 P0802472		125mL Plastic NP 125mL Plastic NP								
P0802472		125mL Plastic NP								
Explain a	ny discrenancies	: (include lab sample ID	numbers).							

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0802472	
Project: JPL Groundwater Monitoring 3Q08 / G486090			
Sample(s) received on: 8/4/08	Date opened: 8/4/08	by:	MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802472-007.01	125mL Plastic NP					
			····			
						
						4
	The state of the s					

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802472

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 08/04/08

Sample Matrix:

Project Number: G486090 WATER

Date Received: 08/04/08

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-24-4	P0802472-001	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-3	P0802472-002	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-2	P0802472-003	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-1	P0802472-004	0.010	0.006	1	NA	08/04/08 14:40	ND	
EB-11-08/04/08	P0802472-005	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-26-2	P0802472-006	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-26-1	P0802472-007	0.010	0.006	1	NA	08/04/08 14:40	ND	
Method Blank	P0802472-MB	0.010	0.006	1	NA	08/04/08 14:40	ND	

Date:

QA/QC Report

Client:

Battelle

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802472

Date Analyzed: 8/4/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Ine Julers

Approved By: ICCBMDL/120594

Date:

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802472

Date Analyzed: 8/4/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0404	97
CCVI	0.0418	0.0404	97
CCV2	0.0418	0.0404	97

Approved By:

CCV1A/120594

me Julet Date:

QA/QC Report

Client:

Battelle

Service Request: P0802472

Project Name:

JPL Groundwater Monitoring 3Q08

NA

08/04/08

Project Number:

G486090

Date Collected: Date Received: NA

Sample Matrix:

WATER

Date Extracted: Date Analyzed:

NA

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802472-LCS

Basis:

Test Notes:

	Prep	Analysis			Darcont	Percent Recovery Acceptance	Result
Analyte	Method	•	True Value	Result		Limits	Notes
Chromium, Hexavalent	None	7196A	0.040	0.0412	103	92-113	

Me Juderse Date:

QA/QC Report

Client: Battelle

Project Name: JPL Groundwater Monitoring 3Q08

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

Service Request: P0802472
Date Collected: 08/04/08
Date Received: 08/04/08
Date Extracted: NA

Date Analyzed: 08/04/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-24-1

Lab Code: P08

P0802472-004MS

P0802472-004DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0512	0.0512	102	102	82-114	<1	

Approved By

Date

16

Report By:NFallahi



CAS SR #P0802511

Table of Contents

Cover Letter	
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Hexavalent Chromium Raw Data	14-24



LABORATORY REPORT

August 14, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the sample submitted to our laboratory on August 5, 2008. For your reference, these analyses have been assigned our service request number P0802511.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains At 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. 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.

Jeleste

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager



Client:

Battelle

CAS Project No:

P0802511

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The sample was received intact under chain of custody on August 5, 2008 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client: Battelle Service Request: P0802511

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

 SAMPLE #
 CLIENT SAMPLE ID
 DATE
 TIME

 P0802511-001
 MW-7
 08/05/08
 09:55

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

155 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 Phone (805) 526-7161

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 Remarks က 4 Ŋ 9 / CAS Contact クク Timeか 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 My Type: Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL/Arequired (Yes / No × 8270C 🗆 (Subcontracted) 225 Semi-Volatile Organics GC/MS TPH FC □ 8015M (Subconfracted) TPH Diesel 8015B □ (Subcontracted) Volatile Organics GC/MS 624 □ 82608 □ Oxygena □ sətsnəgyxO □ 80928 TPH Gas 🗆 ATTEN: GETTALD TOMPKING Number of Containers 591 GW MON 3008 0# 4320 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) SOS KING AVE P.O. # / Billing Information 0609850 Matrix Project Number COLUMBUS Project Name Sampler (Print & Sign) Date Time Collected Collected 855 8/2/08 3990 OLD TOWN AVE, C-205 Company Name & Address (Reporting Information) Fax (805) 526-7270 Laboratory ID Number SAN DIEGO, CA 92110 CONVER Email Address for Result Reporting Fier 1 - (Results/Default if not specified) Report Tier Levels - please select BATTELLE 1182-727-811 An Employee - Owned Company Relinquished by: (Signatere) Fier II - (Results + QC) DAVID Project Manager Client Sample ID

ပွ

Temperature

Cooler Blank (Ice Mo Ice

Time:)

Received by: (Sign

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



Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0802511

Project: JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802511-001.01	08/05/2008	1720	SMO / LKUKITA	
	08/05/2008	1723	In Lab / NFALLAHI	
	08/05/2008	1824	P-37 / NFALLAHI	
	08/06/2008	0913	In Lab / NFALLAHI	
	08/06/2008	1042	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		1		_	Work order:	P0802511			
_		vater Monitoring 3Q08	3 / G486090							
	(s) received on:			_	Date opened:	****	by:	LKUK		
		samples received by CAS.							on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva	luated either at th	e request of the cli	ent and/or as required	d by the method/SO	P. <u>Yes</u>	<u>No</u>	N/A
1	Were sample	containers properly	marked with o	lient sample l	D?			\boxtimes		
2	_	supplied by CAS?		1				X		
3	Did sample c	ontainers arrive in go	ood condition:	?				X		
4	_	of-custody papers used						$\overline{\mathbf{x}}$		
5	Did sample container labels and/or tags agree with custody papers?									
6	_	volume received adequ		• 1	1			X X		
7	_	within specified holdin	•					X		
8	-	emperature (thermal	-	of cooler at re	eceipt adhered	to?		X		
	(Cooler Temperature	-	°C Blank	Temperature	3	°C			
9	Was a trip bla	ank received?		-	•		-			X
	Trip blank s	supplied by CAS: Seri	al#		-TB					
10	Were custody	seals on outside of co	ooler/Box?				_		\times	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ture and date included	1?							\times
	Were seals i	intact?								\boxtimes
	Were custody	seals on outside of sa	mple containe	er?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ture and date included	1?							X
	Were seals i	intact?								X
11	Do containers	have appropriate pre	eservation, ac	cording to me	thod/SOP or (Client specified i	nformation?	X		
	Is there a clie	ent indication that the	submitted sar	nples are pH	preserved?					X
	Were VOA v	ials checked for prese	ence/absence c	of air bubbles?	1					\times
	Does the clien	nt/method/SOP requir	e that the ana	lyst check the	sample pH ar	nd if necessary a	lter it?			X
12	Tubes:	Are the tubes cap	ped and intac	t?						X
		Do they contain	moisture?							X
13	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bac	lges separated	and individu	ally capped ar	nd intact?				X
Lab:	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receit	ot / Presi	ervation	
		Description	pH *	pH	pH	(Presence/Absence		'omme r		
P0802511	-001.01	125mL Plastic NP								

			v·							
Explain a	ny discrepancies	s: (include lab sample II	numbers):							ائــــــــــــــــــــــــــــــــــــ
	-	-	•		····	***************************************		*****		

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802511

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 08/05/08

Project Number: G486090

Date Received: 08/05/08

Sample Matrix: WATER

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-7	P0802511-001	0.010	0.006	1	NA	08/06/08 09:45	ND	
Method Blank	P0802511-MB	0.010	0.006	1	NA	08/06/08 09:45	ND	

Approved By

Judersa

QA/QC Report

Client:BattelleService Request:P0802511Project:JPL Groundwater Monitoring 3Q08 / G486090Date Analyzed:8/6/08

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

Approved By: ICCBMDL/120594

The July Date: 8/14/08

QA/QC Report

ne Judeste Date: 8/14/

Client:

Battelle

Service Request: P0802511

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 8/6/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0407	97
CCVI	0.0418	0.0393	98

Approved By:

CCV1A/120594

QA/QC Report

Client:

Battelle

P0802511 **Service Request:**

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: NA

Project Number: Sample Matrix:

G486090 WATER

Date Received: NA

Date Extracted: Date Analyzed:

NA

08/06/08

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Basis:

NA

Lab Code:

P0802511-LCS

Test Notes:

					CAS				
						Percent			
	Prep	Analysis			Downont	Recovery Acceptance	D 14		
Analyte	Method	Analysis Method	True Value	Result		Limits	Result Notes		
Chromium, Hexavalent	None	7196A	0.040	0.0420	105	92-113			

Approved By

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0802511

Date Collected: 08/05/08

Date Received: 08/05/08

Date Extracted: NA

Date Analyzed: 08/06/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-7

P0802511-001MS

P0802511-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0528	0.0528	106	106	82-114	<1	

Approved By



CAS SR #P0802585

Simi Valley, California 93065

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LABORATORY REPORT

August 18, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 8, 2008. For your reference, these analyses have been assigned our service request number P0802585.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 23 pages.

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

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

e Julierer

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page



Client:

Battelle

CAS Project No:

P0802585

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Simi Valley, California 93065

CASE NARRATIVE

The samples were received intact under chain of custody on August 8, 2008 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

Client:

Battelle

Project:

JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

Service Request: P0802585

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0802585-001	MW-5	08/08/08	08:10
P0802585-002	MW-6	08/08/08	11:40
P0802585-003	MW-15	08/08/08	13:00

Columbia Analytical Services, Inc.

Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

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

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

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

Page l of

2655 Park Center Drive, Suite A

Columbia Analytical

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

An Employee - Owned Company

CAS Project No. Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 Other Remarks Cooler / Blank (Ice) No Ice N က 4 ις. 9 1 CAS Contact Temperature SKAT TIME PX-18158 EDD required (es //No Type: Analysis Method and/or Analytes Preservative Code がいられ X MRL required Yes (No-MDL / PQL / J required Y 8270C 🗆 (Subcontracted) Semi-Volatile Organics GC/MS TPH FC - 8015M (Subcontracted) TPH Diesel Low Level 8015B [Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) ☐ sas ☐ Oxygenates 🗆 8560B □ **†**79 Volatile Organics GC/MS 3008 Number of Containers ATTN: GERALD TOMPIKINS
505 HING AVE. Tier III - (Data Validation Package) 10% Surcharge comments, of 4320 3990 0LD TOWN AVE, C-205 57C GW MON. P.O. # / Billing Information 0601825 Matrix 3 Project Number Project Name V - (client specified) Sampler (Print & Sign) Date Time Collected Collected 0/1/10 0/8 202 80/20/80 Company Name & Address (Reporting Information) 92110 Laboratory ID Number Email Address for Result Reporting Tier 1 - (Results/Default if not specified) GNNER. SAN DIEGO, CA Report Tier Levels - please select 1182-726-619 Fier II - (Results + QC) DAVID Project Manager Client Sample ID スシッグ ダブ・ Phone

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0802585

Project:

JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802585-001.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1543	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	
P0802585-002.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1544	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	
P0802585-003.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1543	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle					Work order:	P0802585		<u></u>	
		rater Monitoring 3Q08	/ G4 86090							
	s) received on			_	Date opened		by:	MZAN		
		Il samples received by CAS							indication	of
		. Thermal preservation and				the client and/or as t	equired by the meth	od/SOP. <u>Yes</u> ⊠	<u>No</u>	<u>N/A</u>
1	_	containers properly	narked with 6	enent sample	ID?					
2		supplied by CAS?	1 11.1	0				\boxtimes		
3	•	ontainers arrive in go						\boxtimes		
4		of-custody papers used						\boxtimes		
5	-	ontainer labels and/o		•	papers?			X		
6	Was sample	volume received adeq	uate for analy	sis?				\boxtimes		
7	Are samples v	within specified holding	ig times?					X		
8	Was proper to	emperature (thermal)	preservation)	of cooler at	receipt adhered	to?		\times		
	(Cooler Temperature	2	°C Blar	k Temperature		_°C			
9	Was a trip bl	ank received?								\times
	Trip blank s	supplied by CAS: Seri	al#		TB					
10	Were custody	seals on outside of co	ooler/Box?						\boxtimes	
	Location of	seal(s)?					Sealing Lid?			\times
	Were signat	ture and date included	?							\boxtimes
	Were seals	intact?								\times
	Were custody	seals on outside of sa	mple contain	er?					\times	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?	William Commission of the Comm						X
	Were seals	ntact?								X
11	Do containers	have appropriate pre	servation, ac	cording to n	nethod/SOP or 0	Client specified i	nformation?			\times
		ent indication that the s		_		-				X
		ials checked for prese			•					\boxtimes
		nt/method/SOP requir				ud ifnecessary a	lter it?			\boxtimes
12	Tubes:	Are the tubes cap		•	e sampre pri an	d <u>ii necessary</u> a	itter it:			\boxtimes
12	Tubes.	_	_	, i.						\boxtimes
10	D 1	Do they contain n		1 114	0			_		
13	Badges:	Are the badges p				1.1				\boxtimes
		Are dual bed badg	ges separated	and individu	ially capped and	a intact?				X
Lab S	Sample ID	Container	Required	Received		VOA Headspac			ervation	
		Description	pH *	pH	pH	(Presence/Absence	0 ('ommer	its	
P0802585		125mL Plastic NP								
P0802585		125mL Plastic NP								
P0802585	-003.01	125mL Plastic NP		<u> </u>						
				-						
				1			-			
Explain ar	ny discrepancies	: (include lab sample ID	numbers):	 						
			,			S. H				

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

WATER

Service Request: P0802585

Project Name: JPL Groundwater Monitoring 3Q08

Date Collected: 08/08/08

Project Number: G486090

Sample Matrix:

Date Received: 08/08/08

Chromium, Hexavalent

Prep Method: None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-5	P0802585-001	0.010	0.006	1	NA	08/08/08 16:00	ND	
MW-6	P0802585-002	0.010	0.006	1	NA	08/08/08 16:00	ND	
MW-15	P0802585-003	0.010	0.006	1	NA	08/08/08 16:00	ND	
Method Blank	P0802585-MB	0.010	0.006	1	NA	08/08/08 16:00	ND	

Approved By

The July Date:

_C

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802585

Date Analyzed: 8/8/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCBI	0.010	0.006	ND

Approved By: ICCBMDL/120594

Ine Julier 1 Date: 8/18/08

QA/QC Report

Client: Battelle Service Request: P0802585

Project: JPL Groundwater Monitoring 3Q08 / G486090 Date Analyzed: 8/8/08

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

Method: 7196A Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0392	94
CCVI	0.0418	0.0392	94

Approved By

CCV1A/120594

Euc Jule 18/18/08

QA/QC Report

Client: Battelle Service Request: P0802585 **Project Name:** JPL Groundwater Monitoring 3Q08 Date Collected: NA G486090 Date Received: NA **Project Number:** Sample Matrix: WATER Date Extracted: NA 08/08/08 Date Analyzed:

> Laboratory Control Sample Summary **Inorganic Parameters**

Sample Name: Laboratory Control Sample Units: mg/L (ppm)

Lab Code: P0802585-LCS Basis: NA

Test Notes:

CAS Percent Recovery Percent Acceptance Analysis Prep Result Limits Analyte Method Method True Value Result Recovery **Notes** Chromium, Hexavalent None 7196A 0.040 0.0380 95 92-113

QA/QC Report

Client: Battelle

JPL Groundwater Monitoring 3Q08 **Project Name:**

Project Number: G486090 Sample Matrix: WATER

Service Request: P0802585 **Date Collected:** 08/08/08 Date Received: 08/08/08 Date Extracted: NA

Date Analyzed: 08/08/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-5

P0802585-001MS

P0802585-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0492	0.0492	98	98	82-114	<1	

Approved By

Cerdesto Date:



CAS SR #P0802599

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Internal Chain of Custody	
Sample Acceptance Check Form	
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Hexavalent Chromium Raw Data	14-23



LABORATORY REPORT

August 18, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 11, 2008. For your reference, these analyses have been assigned our service request number P0802599.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 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.

Wester

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager

Page 1 of <u>23</u>



Client:

Battelle

CAS Project No:

P0802599

Project:

JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 11, 2008 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: P0802599

Project: JPL Groundwater Monitoring 3Q08/G486090

SAMPLE CROSS-REFERENCE

 SAMPLE #
 CLIENT SAMPLE ID
 DATE
 TIME

 P0802599-001
 MW-13
 08/11/08
 09:05

 P0802599-002
 MW-8
 08/11/08
 11:09

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

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

TDS Total Dissolved Solids

TPH Total Petroleum Hydrocarbons
TSS Total Suspended Solids

TTLC Total Threshold Limit Concentration

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

Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

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

2655 Park Center Drive, Suite A

Columbia Analytical

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

In Acetate Asc Acid Preservative Key H2S04 HN03 NaOH Other (C) 4 13 9 1 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 Analysis Method and/or Analytes Preservative Code O Semi-Volatile Organics GC/MS 625 □ 8270C □ (Subcontracted) PH FC □ 8015M (Subcontracted) Low Level 8015B 🗆 (Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ Oxygenates 🗆 SPI GW MON 3008 collumbus, of 4320 ATTLY. GERALD TOMPHIN 505 KING AVE. 2.43(9) Balling Information 0609859 Project Number Project Name Sampler (Print & Sign) 3990 OLD TOWN AVE. C-205 Company Name & Address (Reporting Information) SAN DIEGO, CA 92110 Email Address for Result Reporting CONNER 1152-227-619 An Employee - Owned Company RATTELLE DAND Project Manager

Project Requirements (MRLs, QAPP) Remarks XIII (CX | TIME 31) EDD required Yes// No Type: Yes Mo MRL required Yes ANO MDL / PQL / J required □ 80928 □ **1**73 Number of Containers Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) Matrix 3 Collected Bos 109 Date Collected 8/11/8 Laboratory ID Number (Tier I - (Results/Default if not specified)
Tier II - (Results + QC) Report Tier Levels - please select Relinquished by: (Signature) Relinquished (Signature) Relinquished by: (Signature) Client Sample ID 00 1-MM MW-

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0802599

Project:

JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802599-001.01	08/11/2008	1329	SMO / LKUKITA	
	08/11/2008	1344	In Lab / NFALLAHI	
	08/11/2008	1638	P-37 / NFALLAHI	
P0802599-002.01	08/11/2008	1329	SMO / LKUKITA	
	08/11/2008	1345	In Lab / NFALLAHI	
	08/11/2008	1638	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		защи	е Ассертансе		Work order:	P0802599			
		rater Monitoring 3Q08	/ G486090							
	s) received on:			•	Date opened:	***************************************	by:	LKUK		
		ll samples received by CAS							indicatio	n of
compliance	or nonconformity	. Thermal preservation and	pH will only be	evaluated either at	the request of t	he client and/or as re	quired by the meth	iod/SOP. Yes	<u>No</u>	N/A
1	Were sample	containers properly r	narked with cl	ient sample ID	?			X		
2	Container(s)	supplied by CAS?						X		
3	Did sample c	ontainers arrive in go	od condition?					X		
4	Were chain-o	f-custody papers used	and filled out	?				\boxtimes		
5	Did sample c	ontainer labels and/or	r tags agree wi	th custody pap	ers?			X		
6	Was sample v	volume received adequ	ate for analys	is?				X		
7	Are samples v	within specified holdin	g times?					\boxtimes		
8	Was proper to	emperature (thermal p	oreservation) o	of cooler at rec	eipt adhered t	to?		\boxtimes		
	C	Cooler Temperature		°C Blank 7	emperature	3	_°C			
9	Was a trip bla	ank received?								$\overline{\mathbf{X}}$
	Trip blank s	supplied by CAS: Seria	al#		-TB					
10	Were custody	seals on outside of co	ooler/Box?						X	
	Location of	seal(s)?					_Sealing Lid?			\times
	Were signat	ure and date included?	?							X
	Were seals i	ntact?								$\overline{\times}$
	Were custody	seals on outside of sar	mple containe	r?					X	
	Location of	seal(s)?					_Sealing Lid?			X
	-	ure and date included?	?							$\overline{\mathbf{X}}$
	Were seals i									X
11		have appropriate pre	-	-		Client specified in	formation?	\times		
	Is there a clie	nt indication that the s	ubmitted samp	ples are pH p	reserved?					X
	Were <u>VOA v</u>	<u>ials</u> checked for prese	nce/absence of	f air bubbles?						\boxtimes
	Does the clien	nt/method/SOP require	e that the analy	yst check the sa	ample pH and	l if necessary al	ter it?			\times
12	Tubes:	Are the tubes cap	ped and intact	?						\boxtimes
		Do they contain n	noisture?							X
13	Badges:	Are the badges p	roperly capped	d and intact?						\times
***************************************		Are dual bed badg	ges separated a	ınd individuall	y capped and	intact?				X
Lab :	Sample ID	Container	Required	Received	Adjusted	VOA Hendspace	Receip	t / Preso	ervation	
		Description	pH *	рН	pН	(Presence/Absence)	(Commen	ts	
P080 25 99	-001.01	125mL Plastic NP								
P0802599	-002.01	125mL Plastic NP								
Explain a	ny discrepancies	:: (include lab sample ID	numbers):							
			·							

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0802599

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: 08/11/08

Project Number: G486090 Sample Matrix:

WATER

Date Received: 08/11/08

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-13	P0802599-001	0.010	0.006	1	NA	08/11/08 16:30	0.039	
MW-8	P0802599-002	0.010	0.006	1	NA	08/11/08 16:30	ND	
Method Blank	P0802599-MB	0.010	0.006	1	NA	08/11/08 16:30	ND	

QA/QC Report

Client: Battelle

Project: JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802599 **Date Analyzed:** 8/11/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

Approved By:

ICCBMDL/120594

Date:

QA/QC Report

Client:

Battelle

Service Request: P0802599

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 8/11/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0386	92
CCV1	0.0418	0.0386	92

Approved B

CCV1A/120594

QA/QC Report

Client:

Battelle

Service Request: P0802599

Project Name:

JPL Groundwater Monitoring 3Q08

Date Collected: NA

Project Number:

G486090

Date Received: NA

Sample Matrix: WATER

Date Extracted: NA Date Analyzed: 08/11/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802599-LCS

Basis: NA

Test Notes:

						CAS Percent	
Analyte	Prep Method	Analysis Method	True Value	Result		Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0408	102	92-113	

ne Jules Date:

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0802599

Date Collected: 08/11/08

Date Received: 08/11/08

Date Extracted: NA

Date Analyzed: 08/11/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-13

P0802599-001MS

P0802599-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	0.0386	0.0916	0.0873	106	97	82-114	5	

Approved By



CAS SR #P0802625

Simi Valley, California 93065

Table of Contents

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LABORATORY REPORT

August 19, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 12, 2008. For your reference, these analyses have been assigned our service request number P0802625.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 23 pages.

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

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

Julers

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson

Project Manager



Client:

Battelle

CAS Project No:

P0802625

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Simi Valley, California 93065

CASE NARRATIVE

The samples were received intact under chain of custody on August 12, 2008 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

JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802625

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0802625-001	MW-16	08/12/08	10:04
P0802625-002	MW-10	08/12/08	13:05

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

Columbia 20 Analytical Si	2655 Park Center Drive, Suite A Simi Valley, California 93065	er Drive, S fornia 930	Suite A														
	Phone (805) 526-7161 Fax (805) 526-7270	6-7161 7270		Requested Turn: 1 Day (100%) 2	Furnaround Tin 5) 2 Day (75%)	Fime in %) 3 Da	e in Busines 3 Day (50%)	ss Days	around Time in Business Days (Surcharges) Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (please circle 25%) 10 Day	cle)ay - Standard	ıdard		CAS Project	ect No.	3625
Company Name & Address (Reporting Information)	porting Inform	ation)	Project Name	me				۷	nalysis	Method	Analysis Method and/or Analytes	nalytes		<u>-</u>	CAS Contact	itact:	
Bortelle),)	ļ		(Pres	Preservative Code	Sode				Prese	Preservative Key
2990 OLD TOWN AVE, C-202	AVE, 0-,	702	UPC GE	12 NOV.	3808				0							·	None
5AN DIE-0 CA 92110	01176 4		Project Number	nber			(bet	/-	·····							-	HC
			648	0609815		្រានា										N 6	HN03
Project Manager			P.O. # / BIII	P.O. # / Billing Information 2.143.19 / 8ATTELLE	nation 12ce	SD HGT	.scted)	cted)						* *************************************		. 4 rc	NaOH Zn Acetate
. ~			117. CA NO. NO. NO. NO. NO. NO. NO. NO. NO. NO.	A S A	43201	MS □ sətsnəg	8E 8021B (Subcontr 8 8012B ⊡	Subcontra								9 2	Asc Acid Other
Email Address for Result Reporting	rting	Sampler (Sampler (Print & Sign)			0B □ Oxy	BTM 🗀 8	3) M3108 (
Client Sample ID	Laboratory ID Number	Date Collected	Time	Matrix	Number of Containers	Volatile Org 624 □ 428 8 285 H9T	BTEX 8021 TPH Diesel	⊐ О∃ НЧТ	Semi-Volati								Remarks
MW-16		894/8	4001	3					×								
		4															
MW-10	7	_	1305		-		_		×							QC 1	EVEL IZ
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eport Tier Levels - please select ier 1 - (Results/Default if not specifie		er III - (Dat	ta Validation F	ackade) 10%	Surcharde	Ĭ,	MBi	iired Ved	CoN		, ממד מ	EDD required Ves No	No		Project R	equirements	Project Requirements (MRLs, QAPP)
ier II - (Results + QC)		er V - (clien	nt specified)	Tier V - (client specified)	28). No.	MDL / PC	ALT req	MDL / PQL/T required/es No	N _o	Type:	edullan les	THE PARTY	Ino.			

Date: Time: 355 Cooler/ Blank (ce / No Ice Date:

Date/12/02/

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0802625

Project: JPL Groundwater Monitoring 3Q08/G486090

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802625-001.01	08/12/2008	1356	SMO / LKUKITA	
	08/12/2008	1402	In Lab / NFALLAHI	
	08/12/2008	1544	P-37 / NFALLAHI	
P0802625-002.01	08/12/2008	1356	SMO / LKUKITA	
	08/12/2008	1402	In Lab / NFALLAHI	
	08/12/2008	1544	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Samp	e Acceptance	Check Form	Work order:	P0802625			
Project:	JPL Groundw	ater Monitoring 3Q08	/ G486090		-					
Sample(s) received on:	8/12/08			Date opened:	8/12/08	by:	LKUK	ITA	
		I samples received by CAS							indication	n of
compliance	or nonconformity.	Thermal preservation and	pH will only be	evaluated either at	t the request of th	he client and/or as req	quired by the meth	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly n	narked with cl	ient sample ID)?			\times		
2	Container(s) s	supplied by CAS?						\times		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Were chain-o	f-custody papers used	and filled out	?				X		
5	Did sample co	ontainer labels and/or	r tags agree wi	th custody pap	ers?			X		
6	Was sample v	olume received adequ	uate for analys	is?				X		
7	Are samples w	vithin specified holdin	g times?					X		
8	Was proper te	mperature (thermal p	preservation) o	of cooler at rec	eipt adhered t	to?		\times		
	C	ooler Temperature		°C Blank	Temperature	2	_°C			
9	Was a trip bla	ink received?								\boxtimes
	Trip blank s	upplied by CAS: Seria	al #		-TB		_			
10	Were custody	seals on outside of co	ooler/Box?				-		X	□ ·
	Location of	seal(s)?					Sealing Lid?			\times
	Were signat	ure and date included:	?				_			X
	Were seals i	ntact?								\boxtimes
	Were custody	seals on outside of sa	mple containe	r?					\times	
	Location of						Sealing Lid?			X
	Were signate	ure and date included?	?				-			\boxtimes
	Were seals i	ntact?								\boxtimes
11	Do containers	have appropriate pre	servation, acc	cording to meth	nod/SOP or C	lient specified in	formation?	X		
	Is there a clie	nt indication that the s	submitted sam	ples are pH p	reserved?					\times
		ials checked for prese								X
		nt/method/SOP require			ample pH and	1 if necessary alt	er it?			\boxtimes
12	Tubes:	Are the tubes cap	•		ampro pri unc	i ii iioobbary are				X
12	14000	Do they contain n	•	•						\boxtimes
12	Badges:	Are the badges p		d and intact?						\boxtimes
13	Dauges:	Are dual bed badg			traannad and	intent?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace		t / Pres		
		Description	pH *	pН	рH	(Presence/Absence)		Commer	1165	
P0802625		125mL Plastic NP							· .	
P0802625	-002.01	125mL Plastic NP								
Explain as	ny discrepancies	: (include lab sample ID	numbers):		······································					

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090

Sample Matrix: WATER Service Request: P0802625

Date Collected: 08/12/08

Date Received: 08/12/08

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-16	P0802625-001	0.010	0.006	1	NA	08/12/08 15:50	ND	
MW-10	P0802625-002	0.010	0.006	1	NA	08/12/08 15:50	ND	
Method Blank	P0802625-MB	0.010	0.006	1	NA	08/12/08 15:50	ND	

Ine Julerke

Date:

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802625

Date Analyzed: 8/12/08

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.006	ND
CCB1	0.010	0.006	ND

Approved By:

ICCBMDL/120594

QA/QC Report

Client:

Battelle

Service Request: P0802625

Project:

JPL Groundwater Monitoring 3Q08 / G486090

Date Analyzed: 8/12/08

Title:

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte:

Chromium, Hexavalent

Method:

7196A

Units:

mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery
ICV	0.0418	0.0395	94
CCV1	0.0418	0.0395	94

Approved By:

CCV1A/120594

Sue Julesto Date:

QA/QC Report

Client:

Battelle

Project Name:

Sample Matrix:

JPL Groundwater Monitoring 3Q08

Date Collected:

Service Request: P0802625 NA

Project Number:

G486090 WATER

Date Received:

NA

Date Extracted: Date Analyzed:

NA

08/12/08

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0802625-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0374	94	92-113	

Approved By

Julesse

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 3Q08

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0802625 **Date Collected:** 08/12/08

Date Received: 08/12/08

Date Extracted: NA

Date Analyzed: 08/12/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-16

P0802625-001MS

P0802625-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0498	0.0488	100	98	82-114	2	

The Judesh Date:

DIVIDER SHEET

RAW DATA FOR

Hexavalent Chromium

ANALYSIS

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pH Run Log

Service Request #(s):

Time: 1340

Sample	VWR lot #	Exp.
pH 2 Buffer	519-05070801	2/20/10
pH 4 Buffer	519-06030802	3/2010
pH 7 Buffer	6250	9130/08
pH 10 Buffer	319-01250806	6109

Slope	Prep.Run#
	<u> </u>
99.2	Run#

pH in liquid: (1) 9040B, (2) 9040C (3) SM 4500 H+B (Note method number in column labeled # below)

pH in solid: (4) 9045C, (5) 9045D (Note method number in column labeled # below)

pH adjustment:(6) 7196A,(7) 7199,(8) 218.6,(9) SM 3500Cr-D,(10) SM 3500Cr-B (Note method # In column labeled #)

Sample	#	рН	Temp. ⁰C	Sample	#	рН	Temp. °C
pH 4.000	6	4.008	22.7				
pH 7.000	Ī	4-005	22-7				
pH 10.000		9.996	22.7		-		
Ref#: 519-05050503B	99	5.600	100月2.7				
PH 2 000		2-012	22-7	di Ana			
Di. H20		2-356	23.5				
PH 2 000		1.998	22-5				
PH 2.000		2.010	22.6				
2625-1.01		2.171	14-1				
1 -2.01		2.189	15.0				
PH 2.000	$\langle \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$	2-014	22.3				
				200		The state of the s	

				N. C.			

			4 4					
Comments:	DH	ad Justed	1 w/conc	H2504 (EMA	47056.	OXP 9/13/	/-1
	1-1-4-					11000		
•								

*	Soil	or	Solid	prep:	1:1	(wt:vol)	with	DΙ	water:	
	_					. ,				

** Samples received past recommended hold time.

Date buffers and filling solution changed:

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst:

15

Hexavalent Chromium (Liquids)

thods: (1) EPA 719	1625		0	Run#:	23466	·		Columbia Analytical ServiceS ^{inc}
ck#: <u>519-0512</u> //CCV#: <u>519-07</u> ,			(OF)	Conc. H.SC). Lot#: 5MC	470501	exp 9/13/	(0)
/CCV#: <u>S19-07</u> ,	20000 <u>~</u>	0,418 SM	1	Coloring R	eagent Ref#: S	19-0804	0801 (exp	914/08)
Working Curve:		Prep Dilution NA		0.05/50	0.25/50	0.5/50	Corr. Coeff.	
C		ntration mg/L		0.00	0.01	0.05	0.1	0.999723
	Absorban	ce @ 540 nm		0.000	0.008	0.046	0.096	
13	****		\			Corrected		
Sample #	Sample	E	E		Absorbance	Abs.	Results -	QA/QC - %R
Sample # \#\	Vol.(mL)	Dilution	$\overline{}$	Bkg.	@ 540nm	(minus bkg.)	mg/L	/ RPD
ICB H	10	NIA	v	0.000	0.000	0.000	0.00112	<0.006
ICV O.OHBPPM	5 50				0.037	0.037	0.0395	94%
MB			V		0000	0.000	0.00112	<0.006 ∠0.006
LCS o.0401Pm			V		0 -035	0.035	0.0374	94%
2625-1.01			✓	0-000	0 - 00 0	ก -000	0.00112	<0.006
-1 ms			\checkmark	0.000	0.047	0.047	0.0498	100% JRP
-1.01 MSB			/	0,000	0.046	0.046	0.0488	98% \2
1-2.01			>	0.005	0.005	0.000	0-00112	<0.006
CCVI			>	0.000	0.037	0.037	0.0395	94%
ecBi			$\sqrt{}$	0.000	0.000	0.000	0.00112	<0.006
		tace 1	10	+ WH	W			
		71 0 -		,				·
\setminus								
						:		
pH Requirements:	7196A (2 ±	(0.5); SM 35	00-0	Cr D & B (1 ± 0.3)	* Samples filte	ered prior to pH	adjustment
MS/MSD spiked wi	th 0.05 ml o	f <u>519-05120</u>	80 l	\uparrow 10 of pH	adjusted sam	ple (T.V.= 0.05	ppm)	
	vith 0.4 m l o ・2				adjusted DI V	Water (T.V.= 0.	04 ppm)	
Comments:		NF 8H	2/6	\&				

Prepared By: NE					Date/Time:	8/12/08	1445	-
Analyzed By: NF		/			Date/Time:	V 1112 108	IKKA	

6/3/08	S19-06030801 Hexavalent Chromium Standard
R	Purchased from APG Lot # 118065 To: 334078
	Will peop O.5ml 1 100ml w/DI H20 for prop value of 0.418ppm
	EXP 6/2009
6/3/08	519-04030802 pH 4.00 Buffer (Red)
96	Purchased from VWR Lot # 1803799
i	Ex0. 3/2010
413/08	519-06030803 Conductivity Std Tu= 98.5 umhos/cm
i pe	Purchased from YWR Lot# 62565
	Exp. 3/27/09
4/3/08	SIA-06030804 AAB Conductivity Std TV: 990 unhos/EM
X	Richased from VWR Lot # 51e1e28
	Exp. 4/10/09
6/2/08	519-04030805 Conductivity Std TV = 9,934 umhos/cm
X	Purchased from VWR Lot # 62566
	Exp. 3/17/09
8010/4	519-04040801 TSS LCS
	0.01964 518-09160603 (EXP. 2010) \$ 100mL w OI H20 TV = 196ppo
	Ex0. 617108

1125/08 S19-01250804 ICOI EVENT 200 ml 519-01210805A (10x cence/vent; AP:1 UP TO 21 W/DI H20 axp: 1/9/09 1/25/08 319-01250805 ICO2 ICV/CW CV 8+8 TV= 1.67 ppd De 0.5 mL Ref 3/4-12246727; 4-334866 exp: 1/26/66 up to 100 mL with pH adjusted (pH=-4.302), degassed DI Water. BXP: 1/20/08 1/25/08 519-01250806 PH 16.000 BAFFER PURCHASED FROM VWR 101 # 27/2247 EXP: 6/2009 25/08 519-01250807 A,B,C,D,E AV PURCHASED PROM THERMO SUENTIFIC LOT CODE: LOI EXP: 1/24/09 1/28608 519-01280801 Tev/cev Crut std. To=0.334epm De 0.5 ml 519-11190702 (TU=(ac. 800m exp 7/20/08) 1 10mm your EXP. 2/28/08 S19-01290801 0.1 N Hz 504 5.6 ml Conc Hz 504 (EMD 44257F; exp:1/31/08) 12 LW (DI EXP: 1/31/08 519-01290801 1000 ppM AMMONIA STD 0.3141 g NH4C1 (Mallinclaudt Lut 3384 th 38588; exp: 11/2/09) W/ 514-01290801 (0.1N H7504; exp: 1/31/08) 1129/18

	5/8/08	519-0508080	1 11	C) For SM	10 Preservation		
		500,		500ml C		45251 B, EXP. 11	1, « (08
	5/12/08	\$14- <i>0\$</i> (20 8 0)	Cut s		ppm		
	g	lml.	· \$ 519-21220802	(1000 ppm Cv	at 543 , 549. 2/1106	1 TOOML LIDE!	126
			Exc. 21				
		er i serveri i e e e e e e e e e e e e e e e e e					
n et en er Liste kan er er er er er							
			A				
egener (de tempe 111) Organisation							
Salah Sa						en e	

	1/21/08 319-01210803 (rb+ Coloring Reagent (colorimetric)
	90 0.25g 1,6 Dipheny/ carbohydrazide (EMD 311341023 Exp. 11/20/11) 150ml 1/Acetone (EMD 45351A EXP 8/16/02)
,	Ex1 2/21/08
	1/21/08 319-0121080 Ico: Fluent
	9C 200mL SIG-11130705B (10x conc. ELUM+, EXP 11/13/08) + 2L -10I H20
	EXP 11/13/08
	1/21/08 819-01210805 ATB FLOT Floor 10x conc
	2.8564g NaH103 (DESSIGNTED, EMD 43164351 BXP: 1/9/09) + 3.8164g Na2 CO3 (DESSIGNTED, EMD 433634040 EXP. 3/12/09) 1 2L 2/01 H20
	+ 3.81649 Naz CO3 (DESSIGNTED, END 433634040 Exp. 3/12/09)
	1 AL JOI HO
	Exe: 1/9/09
	1/22/08 519-01220801 NO2 (354.1) COLORING REACTENT (COLDESSI) SIS, 1N 250 MI VOLUMETRIC FLASIC ADD 75 MI DI HZO + 2.59 SULFANICAME
	IN 250 MU VOLUMETRIC FLASIC ADD 75 ml DI HZO + 2.59 SULFANICAME
	(STBAKER (36643; EXP: 5/10/12); MIX UNTIL DISSOLVED. THEN ADD
	0,25 9 NED (JTBAKER A43623; EXP: 12/2009); MIX UNTIL DISSOLVED.
	THEN ADD 689 SONUM ALETATE (EMD: 3346B018 A &B SEXP. 9/8/11)
	MIX UNTIL DISSOLVE THEN BLINE UP TO VOLUME WIDI HZD.
	Qf: 2/22/08
	1/22/08 S19-01220802 Crut 1000 ppm Std.
	QC certified concentration - 1000ppm Purchased from IV Lot# A2 - CR03004
	EXP 2/1/2009
	PNI MII DUUM
	1/22/08 519-01220803 A1B Chloride 1000 ppm std for zcoi
	Rechased from APG LOT # 120177
	Exp. 4/2009

100	80/8417
7128/08	519-460 07280802 ICU/CCU Cr STD T.V=0.418 PPm
	prep 05 Ml 319-06030801 (T.V. 8,3.6 ppm exp 612009)
	NE 1 100 M2 W/ Di H20
h h	ex P 8 28 08
7/28/08	519-07280803 TSS LCS
ge	0.2009 at \$18-0914 0403 (EXP. 2010) 1100ml -107 HOW TO 2 200 PM
	Ext. 7/29/08
	6+
814/08	519-08040801 cr coloring Reagent (colorimetric)
NE -	.25 g 1,5 Diphenyl carbohydrazide (EMD 31134623
	exp 11/30/11
4	56 ml Acetone (EMD 45351C, exp 8/16/09)
	EXP: 9/4/08 CXP Sm 8/4/08
ol-lad	CIC ACACHONI TSS ICS THE 214 PORA
8/5/08	519-08050801 TSS LCS T.V= 214 PPM 0.02149 B19-09160603 (QP2010) 1 100 ml w DI H20.
-0/5/08 	EXP: 8/6/08
8/11/08	519-08110801 755 CCS 7,V= 198 PPM
NF	0.0198g 519-09160603 (QP: 2010) 1 100mlw/DIHZ EXP 8(12/08
	AP 8/12/00
8/14/08	519-08140801 Alkaline digestion solv 20.03 NaOH (emp: 451765380; exp: 10/26/10) + 30.09 Naz (03 (emp 46321715A exp: 10/11/17) 1 LL W/DI HZO EXP: 9114/08
Some /NK	20.0g NAOH (OMD: 451765380; EXP: 10/28/10) + 30.0g Naz W3
	(MD 4634715A EXP: 10(11/17) 1 LL W/DI HYO
	ENT. 9114100
8/15/08	319-08/50801 TSS LCS T.V= 205 AM
11=	0.02050 SIQ-09160603 (OCP: 2010) 1100 MW W/DIH20
N	0.0305g 518-09160603 (EXP: 2010) 1100 MW W [DIH20]

pH 7.000 Date open Oake and VIOR lot # 31)7 need Thatos 9/2/03 - 8/30/04 Exp 4/30/2005 VNR lot # 4110 Ried 8/13/04 Nu 8/30/04 exp 30 apr 2006 7/15/05 | VWR lot # 3075, Rec'D 6/24/05, Eq. 3/3/07 JAZ Grand: 7/15/05 used up. 1/25/06 m Fisher 60T # 046866 - 24 exp 1/07 (from American Am RW VWR Lot 5332 Rec 1/26/06 1,07,06 1 26/06 NL VWR 607 5332B exp. 1/3/07. 2/3/06 RW VWR Lot 6205 2/16/07 exp 7/8/3/ ex 7/31/08 DW VWR Lot 6250 exp 9/30/08/ Red D/J7/07