Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI10110905-17A
Client I.D. Number: TB-14-11/08/10

Sampled: 11/08/10 07:00
Received: 11/09/10
Extracted: 11/15/10 22:09
Analyzed: 11/15/10 22:09

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND	0.50	µg/L
2	Chloromethane	ND	1.0	µg/L	37	Chlorobenzene	ND	0.50	µg/L
3	Vinyl chloride	ND	0.50	µg/L	38	Ethylbenzene	ND	0.50	µg/L
4	Chloroethane	ND	0.50	µg/L	39	m,p-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	1.0	µg/L	40	Bromoform	ND	0.50	µg/L
6	Trichlorofluoromethane	ND	0.50	µg/L	41	Styrene	ND	0.50	µg/L
7	1,1-Dichloroethene	ND	0.50	µg/L	42	o-Xylene	ND	0.50	µg/L
8	Dichloromethane	ND	1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	µg/L
9	Freon-113	ND	0.50	µg/L	44	1,2,3-Trichloropropane	ND	1.0	µg/L
10	trans-1,2-Dichloroethene	ND	0.50	µg/L	45	Isopropylbenzene	ND	0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Bromobenzene	ND	0.50	µg/L
12	1,1-Dichloroethane	ND	0.50	µg/L	47	n-Propylbenzene	ND	0.50	µg/L
13	2-Butanone (MEK)	ND	10	µg/L	48	4-Chlorotoluene	ND	0.50	µg/L
14	cis-1,2-Dichloroethene	ND	0.50	µg/L	49	2-Chlorotoluene	ND	0.50	µg/L
15	Bromochloromethane	ND	0.50	µg/L	50	1,3,5-Trimethylbenzene	ND	0.50	µg/L
16	Chloroform	ND	0.50	µg/L	51	tert-Butylbenzene	ND	0.50	µg/L
17	2,2-Dichloropropane	ND	0.50	µg/L	52	1,2,4-Trimethylbenzene	ND	0.50	µg/L
18	1,2-Dichloroethane	ND	0.50	µg/L	53	sec-Butylbenzene	ND	0.50	µg/L
19	1,1,1-Trichloroethane	ND	0.50	µg/L	54	1,3-Dichlorobenzene	ND	0.50	µg/L
20	1,1-Dichloropropene	ND	0.50	µg/L	55	1,4-Dichlorobenzene	ND	0.50	µg/L
21	Carbon tetrachloride	ND	0.50	µg/L	56	4-Isopropyltoluene	ND	0.50	µg/L
22	Benzene	ND	0.50	µg/L	57	1,2-Dichlorobenzene	ND	0.50	µg/L
23	Dibromomethane	ND	0.50	µg/L	58	n-Butylbenzene	ND	0.50	µg/L
24	1,2-Dichloropropane	ND	0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5	µg/L
25	Trichloroethene	ND	0.50	µg/L	60	1,2,4-Trichlorobenzene	ND	1.0	µg/L
26	Bromodichloromethane	ND	0.50	µg/L	61	Naphthalene	ND	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND	2.5	µg/L	62	Hexachlorobutadiene	ND	1.0	µg/L
28	cis-1,3-Dichloropropene	ND	0.50	µg/L	63	1,2,3-Trichlorobenzene	ND	1.0	µg/L
29	trans-1,3-Dichloropropene	ND	0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	100	(70-130)	%REC
30	1,1,2-Trichloroethane	ND	0.50	µg/L	65	Surr: Toluene-d8	104	(70-130)	%REC
31	Toluene	ND	0.50	µg/L	66	Surr: 4-Bromofluorobenzene	104	(70-130)	%REC
32	1,3-Dichloropropane	ND	0.50	µg/L					
33	Dibromochloromethane	ND	0.50	µg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	µg/L					
35	Tetrachloroethene	ND	0.50	µg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

11/22/10
Report Date

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VOC Sample Preservation Report

Work Order: BMI10110905 **Job:** G005862/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
10110905-01A	MW-26-2	Aqueous	2
10110905-02A	MW-26-1	Aqueous	2
10110905-03A	DUPE-08-4Q10	Aqueous	2
10110905-04A	EB-13-11/05/10	Aqueous	2
10110905-05A	TB-13-11/05/10	Aqueous	2
10110905-06A	MW-25-5	Aqueous	2
10110905-07A	MW-25-4	Aqueous	2
10110905-08A	MW-25-3	Aqueous	2
10110905-09A	MW-25-2	Aqueous	2
10110905-10A	MW-25-1	Aqueous	2
10110905-11A	MW-19-5	Aqueous	2
10110905-12A	MW-19-4	Aqueous	2
10110905-13A	MW-19-3	Aqueous	2
10110905-14A	MW-19-2	Aqueous	2
10110905-15A	MW-19-1	Aqueous	2
10110905-16A	EB-14-11/08/10	Aqueous	2
10110905-17A	TB-14-11/08/10	Aqueous	2

11/22/10

Report Date

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Date: *18-Nov-10*

QC Summary Report

Work Order: 10110905

Method Blank

Type: **MBLK** Test Code: **EPA Method 314.0**

File ID: **14** Batch ID: **25446** Analysis Date: **11/10/2010 11:52**

Sample ID: **MB-25446** Units : **µg/L** Run ID: **IC_3_101110A** Prep Date: **11/10/2010 10:54**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND	1								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 314.0**

File ID: **16** Batch ID: **25446** Analysis Date: **11/10/2010 12:29**

Sample ID: **LFB-25446** Units : **µg/L** Run ID: **IC_3_101110A** Prep Date: **11/10/2010 10:54**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	25.4	2	25		102	85	115			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 314.0**

File ID: **39** Batch ID: **25446** Analysis Date: **11/10/2010 20:21**

Sample ID: **10110905-07ALFM** Units : **µg/L** Run ID: **IC_3_101110A** Prep Date: **11/10/2010 10:54**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	34.8	2	25	8.312	106	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 314.0**

File ID: **40** Batch ID: **25446** Analysis Date: **11/10/2010 20:40**

Sample ID: **10110905-07ALFMD** Units : **µg/L** Run ID: **IC_3_101110A** Prep Date: **11/10/2010 10:54**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	35.7	2	25	8.312	110	80	120	34.8	2.6(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **110910.B\043_M.D** Batch ID: **25441** Analysis Date: **11/09/2010 19:30**

Sample ID: **MB-25441** Units : **mg/L** Run ID: **ICP/MS_101109C** Prep Date: **11/09/2010 16:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **110910.B\044_M.D** Batch ID: **25441** Analysis Date: **11/09/2010 19:36**

Sample ID: **LCS-25441** Units : **mg/L** Run ID: **ICP/MS_101109C** Prep Date: **11/09/2010 16:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0468	0.005	0.05		94	85	115			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **110910.B\049_M.D** Batch ID: **25441** Analysis Date: **11/09/2010 20:03**

Sample ID: **10110905-07AMS** Units : **mg/L** Run ID: **ICP/MS_101109C** Prep Date: **11/09/2010 16:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0496	0.005	0.05	0	99	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **110910.B\050_M.D** Batch ID: **25441** Analysis Date: **11/09/2010 20:09**

Sample ID: **10110905-07AMSD** Units : **mg/L** Run ID: **ICP/MS_101109C** Prep Date: **11/09/2010 16:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0475	0.005	0.05	0	95	70	130	0.04962	4.3(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **10111529.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 19:15**

Sample ID: **MBLK MS15W1115M** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 19:15**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	0.5								
Chloromethane	ND	1								
Vinyl chloride	ND	0.5								
Chloroethane	ND	0.5								
Bromomethane	ND	1								
Trichlorofluoromethane	ND	0.5								
1,1-Dichloroethene	ND	0.5								
Dichloromethane	ND	1								
Freon-113	ND	0.5								
trans-1,2-Dichloroethene	ND	0.5								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	0.5								
2-Butanone (MEK)	ND	10								
cis-1,2-Dichloroethene	ND	0.5								
Bromochloromethane	ND	0.5								
Chloroform	ND	0.5								
2,2-Dichloropropane	ND	0.5								
1,2-Dichloroethane	ND	0.5								
1,1,1-Trichloroethane	ND	0.5								
1,1-Dichloropropene	ND	0.5								
Carbon tetrachloride	ND	0.5								
Benzene	ND	0.5								
Dibromomethane	ND	0.5								
1,2-Dichloropropane	ND	0.5								
Trichloroethene	ND	0.5								
Bromodichloromethane	ND	0.5								
4-Methyl-2-pentanone (MIBK)	ND	2.5								
cis-1,3-Dichloropropene	ND	0.5								
trans-1,3-Dichloropropene	ND	0.5								
1,1,2-Trichloroethane	ND	0.5								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	0.5								
Dibromochloromethane	ND	0.5								
1,2-Dibromoethane (EDB)	ND	1								
Tetrachloroethene	ND	0.5								
1,1,1,2-Tetrachloroethane	ND	0.5								
Chlorobenzene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	0.5								
Styrene	ND	0.5								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	0.5								
1,2,3-Trichloropropane	ND	1								
Isopropylbenzene	ND	0.5								
Bromobenzene	ND	0.5								
n-Propylbenzene	ND	0.5								
4-Chlorotoluene	ND	0.5								
2-Chlorotoluene	ND	0.5								
1,3,5-Trimethylbenzene	ND	0.5								
tert-Butylbenzene	ND	0.5								
1,2,4-Trimethylbenzene	ND	0.5								
sec-Butylbenzene	ND	0.5								
1,3-Dichlorobenzene	ND	0.5								
1,4-Dichlorobenzene	ND	0.5								
4-Isopropyltoluene	ND	0.5								
1,2-Dichlorobenzene	ND	0.5								
n-Butylbenzene	ND	0.5								
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5								
1,2,4-Trichlorobenzene	ND	1								
Naphthalene	ND	1								
Hexachlorobutadiene	ND	1								
1,2,3-Trichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	10.2		10		102	70	130			
Surr: Toluene-d8	10.2		10		102	70	130			

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Surr: 4-Bromofluorobenzene	10.2	10	102	70	130	

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Date: 17-Nov-10

QC Summary Report

Work Order: 10110905

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **10111525.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 17:48**

Sample ID: **LCS MS15W1115M** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 17:48**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.44	1	10		84	70	130			
Chloromethane	11.5	2	10		115	70	130			
Vinyl chloride	9.44	1	10		94	70	130			
Chloroethane	9.04	1	10		90	70	130			
Bromomethane	8.74	2	10		87	70	130			
Trichlorofluoromethane	8.01	1	10		80	70	130			
1,1-Dichloroethene	9.52	1	10		95	70	130			
Dichloromethane	8.86	2	10		89	70	130			
Freon-113	10.1	1	10		101	67	141			
trans-1,2-Dichloroethene	9.58	1	10		96	70	130			
Methyl tert-butyl ether (MTBE)	11	0.5	10		110	70	130			
1,1-Dichloroethane	9.66	1	10		97	70	130			
2-Butanone (MEK)	210	10	200		105	70	130			
cis-1,2-Dichloroethene	9.95	1	10		100	70	130			
Bromochloromethane	9.73	1	10		97	70	130			
Chloroform	9.14	1	10		91	70	130			
2,2-Dichloropropane	9.33	1	10		93	70	130			
1,2-Dichloroethane	9.98	1	10		99.8	70	130			
1,1,1-Trichloroethane	9.67	1	10		97	70	130			
1,1-Dichloropropene	9.85	1	10		99	70	130			
Carbon tetrachloride	8.72	1	10		87	70	130			
Benzene	9.69	0.5	10		97	70	130			
Dibromomethane	9.73	1	10		97	70	130			
1,2-Dichloropropane	9.7	1	10		97	70	130			
Trichloroethene	9.81	1	10		98	70	130			
Bromodichloromethane	9.35	1	10		94	70	130			
4-Methyl-2-pentanone (MIBK)	27.9	2.5	25		112	20	182			
cis-1,3-Dichloropropene	9.48	1	10		95	70	130			
trans-1,3-Dichloropropene	8.78	1	10		88	70	130			
1,1,2-Trichloroethane	9.73	1	10		97	70	130			
Toluene	9.39	0.5	10		94	70	130			
1,3-Dichloropropane	9.98	1	10		99.8	70	130			
Dibromochloromethane	8.46	1	10		85	70	130			
1,2-Dibromoethane (EDB)	19.9	2	20		99	70	130			
Tetrachloroethene	9.22	1	10		92	70	130			
1,1,1,2-Tetrachloroethane	9.2	1	10		92	70	130			
Chlorobenzene	9.08	1	10		91	70	130			
Ethylbenzene	9.56	0.5	10		96	70	130			
m,p-Xylene	9.71	0.5	10		97	70	130			
Bromoform	7.38	1	10		74	70	130			
Styrene	10	1	10		100	70	130			
o-Xylene	9.61	0.5	10		96	70	130			
1,1,2,2-Tetrachloroethane	8.76	1	10		88	70	130			
1,2,3-Trichloropropane	18.4	2	20		92	70	130			
Isopropylbenzene	8.99	1	10		90	70	130			
Bromobenzene	9.22	1	10		92	70	130			
n-Propylbenzene	9.22	1	10		92	70	130			
4-Chlorotoluene	9.28	1	10		93	70	130			
2-Chlorotoluene	8.94	1	10		89	70	130			
1,3,5-Trimethylbenzene	9.12	1	10		91	70	130			
tert-Butylbenzene	9.02	1	10		90	70	130			
1,2,4-Trimethylbenzene	9.21	1	10		92	70	130			
sec-Butylbenzene	9.09	1	10		91	70	130			
1,3-Dichlorobenzene	9.33	1	10		93	70	130			
1,4-Dichlorobenzene	9.11	1	10		91	70	130			
4-Isopropyltoluene	9.19	1	10		92	70	130			
1,2-Dichlorobenzene	8.79	1	10		88	70	130			
n-Butylbenzene	9.9	1	10		99	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	47.8	3	50		96	70	130			
1,2,4-Trichlorobenzene	9.26	2	10		93	70	130			
Naphthalene	10.1	2	10		101	70	130			
Hexachlorobutadiene	17.7	2	20		88	70	130			
1,2,3-Trichlorobenzene	10.3	2	10		103	70	130			
Surr: 1,2-Dichloroethane-d4	10.2		10		102	70	130			
Surr: Toluene-d8	9.71		10		97	70	130			

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Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Surr: 4-Bromofluorobenzene	9.87	10	99	70	130	

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Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **10111530.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 19:37**

Sample ID: **10110905-07AMS** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 19:37**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	40.4	2.5	50	0	81	13	167			
Chloromethane	51	10	50	0	102	28	145			
Vinyl chloride	48.4	2.5	50	0	97	43	134			
Chloroethane	46.2	2.5	50	0	92	39	154			
Bromomethane	46.9	10	50	0	94	19	176			
Trichlorofluoromethane	41.2	2.5	50	0	82	34	160			
1,1-Dichloroethene	46.8	2.5	50	0	94	60	130			
Dichloromethane	44	10	50	0	88	68	130			
Freon-113	50.4	2.5	50	0	101	49	141			
trans-1,2-Dichloroethene	47.6	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	54.7	1.3	50	0	109	56	141			
1,1-Dichloroethane	47.4	2.5	50	0	95	61	130			
2-Butanone (MEK)	817	50	1000	0	82	20	182			
cis-1,2-Dichloroethene	48.5	2.5	50	0	97	70	130			
Bromochloromethane	47.7	2.5	50	0	95	70	130			
Chloroform	44.9	2.5	50	0	90	67	130			
2,2-Dichloropropane	42.3	2.5	50	0	85	30	152			
1,2-Dichloroethane	49.9	2.5	50	0	99.9	60	135			
1,1,1-Trichloroethane	47.3	2.5	50	0	95	59	137			
1,1-Dichloropropene	48.6	2.5	50	0	97	63	130			
Carbon tetrachloride	43.7	2.5	50	0	87	50	147			
Benzene	47.8	1.3	50	0	96	67	130			
Dibromomethane	48.1	2.5	50	0	96	69	133			
1,2-Dichloropropane	47.4	2.5	50	0	95	69	130			
Trichloroethene	46	2.5	50	0	92	69	130			
Bromodichloromethane	47	2.5	50	0	94	66	134			
4-Methyl-2-pentanone (MIBK)	128	13	125	0	103	20	182			
cis-1,3-Dichloropropene	44.2	2.5	50	0	88	63	130			
trans-1,3-Dichloropropene	42.6	2.5	50	0	85	66	131			
1,1,2-Trichloroethane	47.9	2.5	50	0	96	68	130			
Toluene	46.4	1.3	50	0	93	66	130			
1,3-Dichloropropane	48.4	2.5	50	0	97	70	130			
Dibromochloromethane	42.4	2.5	50	0	85	70	130			
1,2-Dibromoethane (EDB)	96.4	5	100	0	96	70	130			
Tetrachloroethene	43.9	2.5	50	0	88	61	134			
1,1,1,2-Tetrachloroethane	44.8	2.5	50	0	90	70	130			
Chlorobenzene	43.5	2.5	50	0	87	70	130			
Ethylbenzene	46.4	1.3	50	0	93	68	130			
m,p-Xylene	48	1.3	50	0	96	64	130			
Bromoform	37	2.5	50	0	74	64	138			
Styrene	48.6	2.5	50	0	97	69	130			
o-Xylene	47.2	1.3	50	0	94	70	130			
1,1,2,2-Tetrachloroethane	45.1	2.5	50	0	90	65	131			
1,2,3-Trichloropropane	90.1	10	100	0	90	70	130			
Isopropylbenzene	44.6	2.5	50	0	89	64	138			
Bromobenzene	45.7	2.5	50	0	91	70	130			
n-Propylbenzene	46.2	2.5	50	0	92	66	132			
4-Chlorotoluene	46.1	2.5	50	0	92	70	130			
2-Chlorotoluene	45.4	2.5	50	0	91	70	130			
1,3,5-Trimethylbenzene	45.7	2.5	50	0	91	66	136			
tert-Butylbenzene	44.7	2.5	50	0	89	65	137			
1,2,4-Trimethylbenzene	46.8	2.5	50	0	94	65	137			
sec-Butylbenzene	45.5	2.5	50	0	91	66	134			
1,3-Dichlorobenzene	46.6	2.5	50	0	93	70	130			
1,4-Dichlorobenzene	45.5	2.5	50	0	91	70	130			
4-Isopropyltoluene	45.7	2.5	50	0	91	66	137			
1,2-Dichlorobenzene	43.3	2.5	50	0	87	70	130			
n-Butylbenzene	49	2.5	50	0	98	60	142			
1,2-Dibromo-3-chloropropane (DBCP)	244	15	250	0	98	67	130			
1,2,4-Trichlorobenzene	45.9	10	50	0	92	61	137			
Naphthalene	47	10	50	0	94	40	167			
Hexachlorobutadiene	87.9	10	100	0	88	61	130			
1,2,3-Trichlorobenzene	49.3	10	50	0	99	51	144			
Surr: 1,2-Dichloroethane-d4	51.2		50		102	70	130			
Surr: Toluene-d8	47.2		50		94	70	130			

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Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Surr: 4-Bromofluorobenzene	50.4	50	101	70	130	

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QC Summary Report

Work Order: 10110905

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **10111532.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 20:21**

Sample ID: **10110905-13AMS** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 20:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	39.6	2.5	50	0	79	13	167			
Chloromethane	55.8	10	50	0	112	28	145			
Vinyl chloride	51.4	2.5	50	0	103	43	134			
Chloroethane	47.1	2.5	50	0	94	39	154			
Bromomethane	48.4	10	50	0	97	19	176			
Trichlorofluoromethane	41.8	2.5	50	0	84	34	160			
1,1-Dichloroethene	47.4	2.5	50	0	95	60	130			
Dichloromethane	43.9	10	50	0	88	68	130			
Freon-113	49.4	2.5	50	0	99	49	141			
trans-1,2-Dichloroethene	47.4	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	54.2	1.3	50	0	108	56	141			
1,1-Dichloroethane	47.8	2.5	50	0	96	61	130			
2-Butanone (MEK)	810	50	1000	0	81	20	182			
cis-1,2-Dichloroethene	47.1	2.5	50	0	94	70	130			
Bromochloromethane	48.3	2.5	50	0	97	70	130			
Chloroform	44.7	2.5	50	0	89	67	130			
2,2-Dichloropropane	42	2.5	50	0	84	30	152			
1,2-Dichloroethane	48.7	2.5	50	0	97	60	135			
1,1,1-Trichloroethane	48.2	2.5	50	0	96	59	137			
1,1-Dichloropropene	49	2.5	50	0	98	63	130			
Carbon tetrachloride	45.4	2.5	50	0	91	50	147			
Benzene	48	1.3	50	0	96	67	130			
Dibromomethane	47.3	2.5	50	0	95	69	133			
1,2-Dichloropropane	47.9	2.5	50	0	96	69	130			
Trichloroethene	46.6	2.5	50	0	93	69	130			
Bromodichloromethane	48.2	2.5	50	0	96	66	134			
4-Methyl-2-pentanone (MIBK)	128	13	125	0	103	20	182			
cis-1,3-Dichloropropene	45.2	2.5	50	0	90	63	130			
trans-1,3-Dichloropropene	43	2.5	50	0	86	66	131			
1,1,2-Trichloroethane	46.8	2.5	50	0	94	68	130			
Toluene	45.8	1.3	50	0	92	66	130			
1,3-Dichloropropane	48.4	2.5	50	0	97	70	130			
Dibromochloromethane	44	2.5	50	0	88	70	130			
1,2-Dibromoethane (EDB)	95.7	5	100	0	96	70	130			
Tetrachloroethene	45.3	2.5	50	0	91	61	134			
1,1,1,2-Tetrachloroethane	46.7	2.5	50	0	93	70	130			
Chlorobenzene	44.2	2.5	50	0	88	70	130			
Ethylbenzene	46.6	1.3	50	0	93	68	130			
m,p-Xylene	47	1.3	50	0	94	64	130			
Bromoform	39.7	2.5	50	0	79	64	138			
Styrene	48.6	2.5	50	0	97	69	130			
o-Xylene	47	1.3	50	0	94	70	130			
1,1,2,2-Tetrachloroethane	44.9	2.5	50	0	90	65	131			
1,2,3-Trichloropropane	88.3	10	100	0	88	70	130			
Isopropylbenzene	44.6	2.5	50	0	89	64	138			
Bromobenzene	45.3	2.5	50	0	91	70	130			
n-Propylbenzene	46.1	2.5	50	0	92	66	132			
4-Chlorotoluene	46.3	2.5	50	0	93	70	130			
2-Chlorotoluene	45.4	2.5	50	0	91	70	130			
1,3,5-Trimethylbenzene	45.8	2.5	50	0	92	66	136			
tert-Butylbenzene	44.7	2.5	50	0	89	65	137			
1,2,4-Trimethylbenzene	46.1	2.5	50	0	92	65	137			
sec-Butylbenzene	45.2	2.5	50	0	90	66	134			
1,3-Dichlorobenzene	46.9	2.5	50	0	94	70	130			
1,4-Dichlorobenzene	45.7	2.5	50	0	91	70	130			
4-Isopropyltoluene	46.3	2.5	50	0	93	66	137			
1,2-Dichlorobenzene	44.2	2.5	50	0	88	70	130			
n-Butylbenzene	49.7	2.5	50	0	99	60	142			
1,2-Dibromo-3-chloropropane (DBCP)	238	15	250	0	95	67	130			
1,2,4-Trichlorobenzene	46.7	10	50	0	93	61	137			
Naphthalene	47.2	10	50	0	94	40	167			
Hexachlorobutadiene	87.8	10	100	0	88	61	130			
1,2,3-Trichlorobenzene	51.4	10	50	0	103	51	144			
Surr: 1,2-Dichloroethane-d4	49.3		50		99	70	130			
Surr: Toluene-d8	48.2		50		96	70	130			

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Surr: 4-Bromofluorobenzene	49.6	50	99	70	130	

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QC Summary Report

Work Order: 10110905

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **10111531.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 19:59**

Sample ID: **10110905-07AMSD** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 19:59**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	40.8	2.5	50	0	82	13	167	40.37	1.0(20)	
Chloromethane	56.7	10	50	0	113	28	145	50.99	10.5(20)	
Vinyl chloride	51.2	2.5	50	0	102	43	134	48.38	5.7(20)	
Chloroethane	46.7	2.5	50	0	93	39	154	46.21	1.1(20)	
Bromomethane	50.3	10	50	0	101	19	176	46.87	7.0(20)	
Trichlorofluoromethane	42.6	2.5	50	0	85	34	160	41.18	3.4(20)	
1,1-Dichloroethene	48.7	2.5	50	0	97	60	130	46.81	3.9(20)	
Dichloromethane	45.4	10	50	0	91	68	130	44.02	3.0(20)	
Freon-113	51.4	2.5	50	0	103	49	141	50.42	1.9(20)	
trans-1,2-Dichloroethene	48.6	2.5	50	0	97	63	130	47.57	2.2(20)	
Methyl tert-butyl ether (MTBE)	55.2	1.3	50	0	110	56	141	54.71	0.8(20)	
1,1-Dichloroethane	48.7	2.5	50	0	97	61	130	47.43	2.7(20)	
2-Butanone (MEK)	821	50	1000	0	82	20	182	817.4	0.4(20)	
cis-1,2-Dichloroethene	47.8	2.5	50	0	96	70	130	48.49	1.5(20)	
Bromochloromethane	48.9	2.5	50	0	98	70	130	47.66	2.6(20)	
Chloroform	46	2.5	50	0	92	67	130	44.88	2.4(20)	
2,2-Dichloropropane	43.3	2.5	50	0	87	30	152	42.32	2.4(20)	
1,2-Dichloroethane	50	2.5	50	0	99.9	60	135	49.94	0.0(20)	
1,1,1-Trichloroethane	49.7	2.5	50	0	99	59	137	47.25	5.0(20)	
1,1-Dichloropropene	50.2	2.5	50	0	100	63	130	48.58	3.2(20)	
Carbon tetrachloride	46.8	2.5	50	0	94	50	147	43.67	7.0(20)	
Benzene	49	1.3	50	0	98	67	130	47.83	2.4(20)	
Dibromomethane	48.7	2.5	50	0	97	69	133	48.08	1.2(20)	
1,2-Dichloropropane	48.6	2.5	50	0	97	69	130	47.35	2.5(20)	
Trichloroethene	47.5	2.5	50	0	95	69	130	46.03	3.2(20)	
Bromodichloromethane	48.7	2.5	50	0	97	66	134	46.97	3.5(20)	
4-Methyl-2-pentanone (MIBK)	130	13	125	0	104	20	182	128.2	1.4(20)	
cis-1,3-Dichloropropene	46.1	2.5	50	0	92	63	130	44.23	4.2(20)	
trans-1,3-Dichloropropene	43.3	2.5	50	0	87	66	131	42.55	1.8(20)	
1,1,2-Trichloroethane	48.4	2.5	50	0	97	68	130	47.87	1.0(20)	
Toluene	46.5	1.3	50	0	93	66	130	46.41	0.1(20)	
1,3-Dichloropropane	48.2	2.5	50	0	96	70	130	48.36	0.3(20)	
Dibromochloromethane	44.6	2.5	50	0	89	70	130	42.43	5.0(20)	
1,2-Dibromoethane (EDB)	97.2	5	100	0	97	70	130	96.41	0.8(20)	
Tetrachloroethene	45.8	2.5	50	0	92	61	134	43.92	4.2(20)	
1,1,1,2-Tetrachloroethane	46.4	2.5	50	0	93	70	130	44.83	3.4(20)	
Chlorobenzene	44.9	2.5	50	0	90	70	130	43.51	3.2(20)	
Ethylbenzene	47.6	1.3	50	0	95	68	130	46.38	2.5(20)	
m,p-Xylene	48.4	1.3	50	0	97	64	130	47.99	0.9(20)	
Bromoform	39.3	2.5	50	0	79	64	138	37.01	6.0(20)	
Styrene	49.6	2.5	50	0	99	69	130	48.61	1.9(20)	
o-Xylene	47.5	1.3	50	0	95	70	130	47.15	0.7(20)	
1,1,2,2-Tetrachloroethane	45.2	2.5	50	0	90	65	131	45.14	0.1(20)	
1,2,3-Trichloropropane	90	10	100	0	90	70	130	90.06	0.1(20)	
Isopropylbenzene	45.5	2.5	50	0	91	64	138	44.57	2.0(20)	
Bromobenzene	45.9	2.5	50	0	92	70	130	45.72	0.4(20)	
n-Propylbenzene	46.2	2.5	50	0	92	66	132	46.15	0.0(20)	
4-Chlorotoluene	46.2	2.5	50	0	92	70	130	46.06	0.3(20)	
2-Chlorotoluene	45.8	2.5	50	0	92	70	130	45.41	0.9(20)	
1,3,5-Trimethylbenzene	46.2	2.5	50	0	92	66	136	45.67	1.2(20)	
tert-Butylbenzene	45.3	2.5	50	0	91	65	137	44.69	1.3(20)	
1,2,4-Trimethylbenzene	46.3	2.5	50	0	93	65	137	46.78	1.0(20)	
sec-Butylbenzene	45.8	2.5	50	0	92	66	134	45.53	0.5(20)	
1,3-Dichlorobenzene	47.1	2.5	50	0	94	70	130	46.59	1.1(20)	
1,4-Dichlorobenzene	46	2.5	50	0	92	70	130	45.47	1.2(20)	
4-Isopropyltoluene	46.1	2.5	50	0	92	66	137	45.74	0.7(20)	
1,2-Dichlorobenzene	43.9	2.5	50	0	88	70	130	43.34	1.3(20)	
n-Butylbenzene	50.1	2.5	50	0	100	60	142	48.95	2.3(20)	
1,2-Dibromo-3-chloropropane (DBCP)	244	15	250	0	97	67	130	244.4	0.4(20)	
1,2,4-Trichlorobenzene	46.1	10	50	0	92	61	137	45.9	0.5(20)	
Naphthalene	48.8	10	50	0	98	40	167	47.01	3.8(20)	
Hexachlorobutadiene	89	10	100	0	89	61	130	87.89	1.2(20)	
1,2,3-Trichlorobenzene	51.3	10	50	0	103	51	144	49.31	3.9(20)	
Surr: 1,2-Dichloroethane-d4	50.5		50		101	70	130			
Surr: Toluene-d8	47.8		50		96	70	130			

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Surr: 4-Bromofluorobenzene	48.7	50	97	70	130	

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QC Summary Report

Work Order: 10110905

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **10111533.D** Batch ID: **MS15W1115M** Analysis Date: **11/15/2010 20:42**

Sample ID: **10110905-13AMSD** Units : **µg/L** Run ID: **MSD_15_101115A** Prep Date: **11/15/2010 20:42**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	41.5	2.5	50	0	83	13	167	39.62	4.5(20)	
Chloromethane	57.5	10	50	0	115	28	145	55.81	2.9(20)	
Vinyl chloride	53.2	2.5	50	0	106	43	134	51.41	3.4(20)	
Chloroethane	47.2	2.5	50	0	94	39	154	47.05	0.2(20)	
Bromomethane	50.3	10	50	0	101	19	176	48.42	3.8(20)	
Trichlorofluoromethane	43.8	2.5	50	0	88	34	160	41.83	4.6(20)	
1,1-Dichloroethene	48.9	2.5	50	0	98	60	130	47.36	3.2(20)	
Dichloromethane	45	10	50	0	90	68	130	43.92	2.5(20)	
Freon-113	51.3	2.5	50	0	103	49	141	49.44	3.7(20)	
trans-1,2-Dichloroethene	48.8	2.5	50	0	98	63	130	47.36	3.1(20)	
Methyl tert-butyl ether (MTBE)	56	1.3	50	0	112	56	141	54.21	3.3(20)	
1,1-Dichloroethane	49.2	2.5	50	0	98	61	130	47.78	2.9(20)	
2-Butanone (MEK)	836	50	1000	0	84	20	182	810.1	3.2(20)	
cis-1,2-Dichloroethene	50.7	2.5	50	0	101	70	130	47.14	7.3(20)	
Bromochloromethane	50.7	2.5	50	0	101	70	130	48.34	4.8(20)	
Chloroform	46.3	2.5	50	0	93	67	130	44.73	3.4(20)	
2,2-Dichloropropane	42.8	2.5	50	0	86	30	152	41.97	2.0(20)	
1,2-Dichloroethane	50.3	2.5	50	0	101	60	135	48.65	3.3(20)	
1,1,1-Trichloroethane	49.5	2.5	50	0	99	59	137	48.2	2.6(20)	
1,1-Dichloropropene	51	2.5	50	0	102	63	130	48.99	4.0(20)	
Carbon tetrachloride	47.6	2.5	50	0	95	50	147	45.37	4.7(20)	
Benzene	49.2	1.3	50	0	98	67	130	48.04	2.4(20)	
Dibromomethane	48.4	2.5	50	0	97	69	133	47.27	2.3(20)	
1,2-Dichloropropane	49.6	2.5	50	0	99	69	130	47.87	3.6(20)	
Trichloroethene	47.5	2.5	50	0	95	69	130	46.58	1.9(20)	
Bromodichloromethane	50	2.5	50	0	99.9	66	134	48.22	3.6(20)	
4-Methyl-2-pentanone (MIBK)	130	13	125	0	104	20	182	128.2	1.6(20)	
cis-1,3-Dichloropropene	46.3	2.5	50	0	93	63	130	45.18	2.5(20)	
trans-1,3-Dichloropropene	43.9	2.5	50	0	88	66	131	43.01	2.0(20)	
1,1,2-Trichloroethane	48.6	2.5	50	0	97	68	130	46.76	3.8(20)	
Toluene	46.6	1.3	50	0	93	66	130	45.75	1.9(20)	
1,3-Dichloropropane	49	2.5	50	0	98	70	130	48.35	1.3(20)	
Dibromochloromethane	45.8	2.5	50	0	92	70	130	44.02	4.0(20)	
1,2-Dibromoethane (EDB)	98.9	5	100	0	99	70	130	95.74	3.2(20)	
Tetrachloroethene	45.7	2.5	50	0	91	61	134	45.29	0.9(20)	
1,1,1,2-Tetrachloroethane	47.7	2.5	50	0	95	70	130	46.71	2.0(20)	
Chlorobenzene	45.8	2.5	50	0	92	70	130	44.21	3.6(20)	
Ethylbenzene	48	1.3	50	0	96	68	130	46.59	2.9(20)	
m,p-Xylene	48.7	1.3	50	0	97	64	130	46.97	3.6(20)	
Bromoform	41.9	2.5	50	0	84	64	138	39.69	5.3(20)	
Styrene	50.2	2.5	50	0	100	69	130	48.59	3.2(20)	
o-Xylene	48.1	1.3	50	0	96	70	130	46.95	2.4(20)	
1,1,2,2-Tetrachloroethane	46.3	2.5	50	0	93	65	131	44.89	3.0(20)	
1,2,3-Trichloropropane	91.8	10	100	0	92	70	130	88.32	3.8(20)	
Isopropylbenzene	45.7	2.5	50	0	91	64	138	44.61	2.4(20)	
Bromobenzene	46.6	2.5	50	0	93	70	130	45.3	2.8(20)	
n-Propylbenzene	46.9	2.5	50	0	94	66	132	46.06	1.9(20)	
4-Chlorotoluene	47.7	2.5	50	0	95	70	130	46.27	3.0(20)	
2-Chlorotoluene	46.2	2.5	50	0	92	70	130	45.36	1.9(20)	
1,3,5-Trimethylbenzene	46.7	2.5	50	0	93	66	136	45.83	1.8(20)	
tert-Butylbenzene	46	2.5	50	0	92	65	137	44.7	2.9(20)	
1,2,4-Trimethylbenzene	47.1	2.5	50	0	94	65	137	46.08	2.1(20)	
sec-Butylbenzene	45.8	2.5	50	0	92	66	134	45.2	1.3(20)	
1,3-Dichlorobenzene	48.4	2.5	50	0	97	70	130	46.9	3.2(20)	
1,4-Dichlorobenzene	47.1	2.5	50	0	94	70	130	45.74	2.8(20)	
4-Isopropyltoluene	47	2.5	50	0	94	66	137	46.31	1.5(20)	
1,2-Dichlorobenzene	45.1	2.5	50	0	90	70	130	44.17	2.1(20)	
n-Butylbenzene	50.6	2.5	50	0	101	60	142	49.69	1.7(20)	
1,2-Dibromo-3-chloropropane (DBCP)	251	15	250	0	101	67	130	238.3	5.3(20)	
1,2,4-Trichlorobenzene	47.7	10	50	0	95	61	137	46.65	2.1(20)	
Naphthalene	48.8	10	50	0	98	40	167	47.24	3.3(20)	
Hexachlorobutadiene	90.7	10	100	0	91	61	130	87.78	3.3(20)	
1,2,3-Trichlorobenzene	52.3	10	50	0	105	51	144	51.42	1.6(20)	
Surr: 1,2-Dichloroethane-d4	50.3		50		101	70	130			
Surr: Toluene-d8	48		50		96	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Nov-10*

QC Summary Report

Work Order: 10110905

Surr: 4-Bromofluorobenzene	48.4	50	97	70	130	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMIS10110905

Report Due By : 5:00 PM On : 23-Nov-2010

Client:
Battelle Memorial Institute
655 West Broadway
Suite 1420
San Diego, CA 92101

Report Attention	Phone Number	EMail Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@batelle.org
Shane Walton	(614) 424-4117 x	waltons@battelle.org

EDD Required : **Yes**

Sampled by : Chase Brogdon

PO : 218013

Client's COC # : 29193, 29186 Job : G005862/JPL Groundwater Monitoring

Cooler Temp	Samples Received	Date Printed
4 °C	09-Nov-2010	09-Nov-2010

QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests 314_W	METALS_DW	VOC_TIC_W	VOC_W				Sample Remarks
BMI10110905-01A	MW-26-2	AQ	11/05/10 08:31	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-02A	MW-26-1	AQ	11/05/10 09:06	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-03A	DUPE-08-4Q10	AQ	11/05/10 00:00	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-04A	EB-13-11/05/10	AQ	11/05/10 08:51	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-05A	TB-13-11/05/10	AQ	11/05/10 07:00	1	0	10			VOC by 524 Criteria	VOC by 524 Criteria				Reno Trip Blank 8/12/10
BMI10110905-06A	MW-25-5	AQ	11/05/10 10:18	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-07A	MW-25-4	AQ	11/05/10 10:56	10	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				MS/MSD Level IV QC
BMI10110905-08A	MW-25-3	AQ	11/05/10 11:18	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-09A	MW-25-2	AQ	11/05/10 11:37	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-10A	MW-25-1	AQ	11/05/10 11:59	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				

Comments: No security seals. Frozen ice. Temp Blank #8769 received @ 4°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	**Alpha Analytical, Inc.**	11-9-10 11:14

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMIS10110905

Report Due By : 5:00 PM On : 23-Nov-2010

Client:
Battelle Memorial Institute
655 West Broadway
Suite 1420
San Diego, CA 92101

Report Attention	Phone Number	EMail Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@batelle.org
Shane Walton	(614) 424-4117 x	waltons@battelle.org

EDD Required : **Yes**

Sampled by : Chase Brogdon

PO : 218013

Client's COC # : 29193, 29186 Job : G005862/JPL Groundwater Monitoring

Cooler Temp	Samples Received	Date Printed
4 °C	09-Nov-2010	**09-Nov-2010**

QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests 314_W	METALS_DW	VOC_TIC_W	VOC_W				Sample Remarks
BMI10110905-11A	MW-19-5	AQ	11/08/10 08:57	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-12A	MW-19-4	AQ	11/08/10 09:19	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-13A	MW-19-3	AQ	11/08/10 09:50	10	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				MS/MSD Level IV QC
BMI10110905-14A	MW-19-2	AQ	11/08/10 10:14	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-15A	MW-19-1	AQ	11/08/10 10:39	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-16A	EB-14-11/08/10	AQ	11/08/10 10:30	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria				
BMI10110905-17A	TB-14-11/08/10	AQ	11/08/10 07:00	1	0	10			VOC by 524 Criteria	VOC by 524 Criteria				Reno Trip Blank 8/12/10

Comments: No security seals. Frozen ice. Temp Blank #8769 received @ 4°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	**Alpha Analytical, Inc.**	11-9-10 11:14

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

29193

Billing Information:
Name GERALD TOMPKINS / BATTELLE
Address 505 KING AVE.
City, State, Zip COLUMBUS, OH 43201
Phone Number ______ Fax ______

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State? AZ ___ CA X NV ___ WA ___ ID ___ OR ___ OTHER ___

Page # 1 *of* 1

Client Name: BATTELLE / DAVID CONNER
Address: 3990 OLD TOWN AVE, C-205
City, State, Zip: SAN DIEGO, CA 92110
P.O. #: 218013
Job #: G005862
EMail Address:
Phone #: (619) 726-7311
Fax #:
Sampled by: CHASE BRAGDON
Report Attention:

Analyses Required: VOCs (5242); TOTAL Cd (200.8); ClO4- (314.0)

Required QC Level? I II (III) IV
EDD / EDF? YES ___ NO ___
Global ID # ______

Time Sampled	Date Sampled	Matrix* See Key Below	Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCs (5242)	TOTAL Cd (200.8)	ClO4- (314.0)					REMARKS
0831	11/05/10	AQ	BMI10110905-01	MW-26-2			3v,2p	X	X	X					
0906	↓	↓	-02	MW-26-1			↓	X	X	X					
—	↓	↓	-03	Dupe-08-4Q10			↓	X	X	X					DUPLICATE
0851	↓	↓	-04	EB-13-11/05/10			3v,2p	X	X	X					EQUIPMENT BLANK
0700	11/05/10	AQ	-05	TB-13-11/05/10			1V	X							TRIP BLANK
1018	11/5/10	AQ	-06	MW-25-5			3v,2p	X	X	X					
1056	↓	↓	-07	MW-25-4			6v,4p	X	X	X					MS/MSD, QC LEVEL IV
1118	↓	↓	-08	MW-25-3			3v,2p	X	X	X					
1137	↓	↓	-09	MW-25-2			3v,2p	X	X	X					
1159	11/5/10	AQ	-10	MW-25-1			3v,2p	X	X	X					

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	CHASE BRAGDON	INSIGHT E.C. Inc	11/08/10	1330
Received by	Elizabeth Adcox	Elizabeth Adcox	Alpha	11-9-10	11:14
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Billing Information:
Name GERALD TOMPKINS / BATTELLE
Address 505 KING AVE.
City, State, Zip COLUMBUS, OH 43201
Phone Number ______ Fax ______

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State? AZ ___ CA X NV ___ WA ___ ID ___ OR ___ OTHER ___

29186

Page # 1 of 1

Client Name: BATTELLE / DAVID CONNELL
Address: 3990 OLD TOWN AVE, C-205
City, State, Zip: SAN DIEGO, CA 92110
P.O. # 218013
Job # G005862
EMail Address:
Phone # (619) 726-7311
Fax #
Sampled by: CHASE BRUDON
Report Attention:

Required QC Level? I II (III) IV
EDD / EDF? YES ___ NO ___
Global ID # ___

Time Sampled	Date Sampled	Matrix* See Key Below	Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCs (524.2)	TOTAL Cr (200.8)	ClO4 (314.0)				REMARKS
0857	11/08/10	AQ	-11	MW-19-5			3v, 2p	X	X	X				
0919	↓	↓	-12	MW-19-4			3v, 2p	X	X	X				
0950	↓	↓	-13	MW-19-3			6v, 4p	X	X	X				MS/MSD, QC LEVEL IV
1014	↓	↓	-14	MW-19-2			3v, 2p	X	X	X				
1039	↓	↓	-15	MW-19-1			↓	X	X	X				
1030	↓	↓	-16	EB-14-11/08/10			3v, 2p	X	X	X				EQUIPMENT BLANK
0700	11/08/10	AQ	-17	TB-14-11/08/10			1v	X						TRIP BLANK

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	CHASE BRUDON	INSIGHT E.C., INC	11/08/10	1330
Received by	Elizabeth Adcox	Elizabeth Adcox	Alpha	11-9-10	11:14
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

LABORATORY REPORT

November 19, 2010

David Conner
Battelle
4800 Oak Grove Dr.
M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 4Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on November 5, 2010. For your reference, these analyses have been assigned our service request number P1004148.

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

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1004148
Project: JPL GW Mon 4Q10 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on November 5, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 4Q10 / G486090
Service Request: P1004148

Date Received: 11/5/2010
Time Received: 15:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-26-2	P1004148-001	Water	11/5/2010	08:31	X
MW-26-1	P1004148-002	Water	11/5/2010	09:06	X
DUPE-08-4Q10	P1004148-003	Water	11/5/2010	00:00	X
EB-13-11/05/10	P1004148-004	Water	11/5/2010	08:51	X
MW-25-5	P1004148-005	Water	11/5/2010	10:18	X
MW-25-4	P1004148-006	Water	11/5/2010	10:56	X
MW-25-3	P1004148-007	Water	11/5/2010	11:18	X
MW-25-2	P1004148-008	Water	11/5/2010	11:37	X
MW-25-1	P1004148-009	Water	11/5/2010	11:59	X

Columbia Analytical Services, Inc.

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC
An Employee - Owned Company

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

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

CAS Project No. P1004148

CAS Contact:

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

Project Name
4Q10
JPL GW MON ~~2009~~

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
243197 BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)
CHASE BRADDON

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (7199)	Remarks
MW-26-2	1	11/05/10	0831	W	1						X	
MW-26-1	2	↓	0906	W	1						X	
DUPE-08-4Q10	3	↓	〃	W	1						X	DUPLICATE
EB-13-11/05/10	4	11/05/10	0851	W	1						X	EQUIPMENT BLANK
MW-25-5	5	11/05/10	1018	W	1						X	
MW-25-4	6	↓	1056	W	2						X	MS/MSD, QC LEVEL IV
MW-25-3	7	↓	1114	W	1						X	
MW-25-2	8	↓	1137	W	1						X	
MW-25-1	9	11/05/10	1159	W	1						X	

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

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____
MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	11/05/10	1900	Received by: (Signature)	11/5/10	1900
Relinquished by: (Signature)	11/6/10	1315	Received by: (Signature)	11/6/10	1315
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

5 of 23

Client: Battelle **Service Request:** P1004148
Project: JPL GW Mon 4Q10/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1004148-001.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-002.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1627	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-003.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1627	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-004.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-005.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1627	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-006.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1627	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-006.02					
		11/5/10	1539	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-007.01					
	7196A				

Client: Battelle **Service Request:** P1004148
Project: JPL GW Mon 4Q10/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-008.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	
P1004148-009.01					
	7196A				
		11/5/10	1538	SMO / MZAMORA	
		11/5/10	1539	P-37 / MZAMORA	
		11/5/10	1628	In Lab / SANDERSON	
		11/8/10	1638	P-37 / SANDERSON	

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Sample Acceptance Check Form

Client: Battelle Work order: P1004148

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/5/10 Date opened: 11/5/10 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004148-001.01	125mL Plastic NP					
P1004148-002.01	125mL Plastic NP					
P1004148-003.01	125mL Plastic NP					
P1004148-004.01	125mL Plastic NP					
P1004148-005.01	125mL Plastic NP					

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

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

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Sample Acceptance Check Form

Client: Battelle Work order: P1004148

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/5/10 Date opened: 11/5/10 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004148-006.01	125mL Plastic NP					
P1004148-006.02	125mL Plastic NP					
P1004148-007.01	125mL Plastic NP					
P1004148-008.01	125mL Plastic NP					
P1004148-009.01	125mL Plastic NP					

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 4Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1004148
Date Collected : 11/05/10
Date Received : 11/05/10

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-26-2	P1004148-001	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-26-1	P1004148-002	0.010	0.004	1	NA	11/05/10 18:15	ND	
DUPE-08-4Q10	P1004148-003	0.010	0.004	1	NA	11/05/10 18:15	ND	
EB-13-11/05/10	P1004148-004	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-25-5	P1004148-005	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-25-4	P1004148-006	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-25-3	P1004148-007	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-25-2	P1004148-008	0.010	0.004	1	NA	11/05/10 18:15	ND	
MW-25-1	P1004148-009	0.010	0.004	1	NA	11/05/10 18:15	ND	
Method Blank	P1004148-MB	0.010	0.004	1	NA	11/05/10 18:15	ND	

Approved By Karen Ryan Date : 11/9/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1004148
Project:	JPL GW Mon 4Q10 / G486090	**Date Analyzed:**	11/05/10

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

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

Approved By: Karen Ryan Date: 11/9/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 4Q10 / G486090

Service Request: P1004148
Date Analyzed: 11/05/10

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0569	98	90-110
CCV1	0.0579	0.0560	97	90-110
CCV2	0.0579	0.0560	97	90-110

Approved By: Karen Ryan Date: 11/9/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004148
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/05/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1004148-LCS	Basis :	NA

Test Notes :

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

Approved By Karen Ryan Date : 11/9/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004148
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	11/05/10
Project Number :	G486090	**Date Received :**	11/05/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/05/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-25-4
Lab Code : P1004148-006MS P1004148-006DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0506	0.506	101	1012	78-112	<1	

Approved By Karen Ryan Date : 11/9/10

Report By:SAnderson

Columbia Analytical Services INC

pH Run Log

Service Request #(s): 4148

Time: 0820

Sample	VWR lot #	Exp.
pH 2 Buffer	519-11200904	5/2011
pH 4 Buffer	524-03011001	8/31/11
pH 7 Buffer	524-03011002	1/31/12
pH 10 Buffer	524-03021001	9/30/11

Slope	Prep.Run #
97.7%	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C **pH in solid:** (3) 9045C, (4) 9045D (*Note method number in column labeled # below*)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	2.004	22.8°	4148-9.01	5	2.082	14.8°
pH 4.000		4.000	22.6°	pH 2.000	5	2.012	21.6°
pH 7.000		6.990	22.5°				
pH 10.000		9.997	22.5°				
Ref#: 59-11230903C T.V.=6.46 EXP: 1/2012		6.375	22.7°				
DI H2O		2088	21.1°				
pH 2.000		1.989	22.5°				
TIME: 1630							
pH 2.000	5	2.008	22.0°				
4148-1.01		1.845	12.8°				
-2.01		1.827	13.0°				
-3.01		1.887	12.9°			Space not used	
-4.01		1.714	13.4°				
-5.01		2.060	13.6°				
-6.01		2.087	13.7°				
-7.01		1.930	13.5°				
-8.01		2.010	14.7°				

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 GAD 49284 EXP: 11/20/14

☐ **7199A**: Diluted NaOH __________ EXP: __________

Comments: ____________________

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 11/1/10

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

Analyst: [signature] Date: 11/5/10

Reviewer: KR Date: 11/9/10

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services™

Method EPA 7196A

Service Request#(s): 4148 Run#: 224145

Stock#: 524-1019/001 T.V = 10ppm EXP: 3/1/11 Prep Run#: —

ICV/CCV#: 524-1101/001 T.V = 0.579PPM EXP: 11/15/10 Conc. H_2SO_4 Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: 524-1101002 EXP: 11/15/10

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99998808
Absorbance @ 540 nm	0.000	0.011	0.055	0.111	

	Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	ICB	10ml	—	✓	0.000	0.000	0.000	0.000124	<0.004
2	ICV 0.0579PPM		—	✓	0.000	0.063	0.063	0.0569	98%
3	MB		—	✓	0.000	0.000	0.000	0.000124	<0.004
4	LCS 0.040PPM		—	✓	0.000	0.043	0.043	0.0389	97%
5	4148-1.01		—	✓	0.003	0.003	0.000	0.000124	<0.004
6	-2.01		—	✓	0.000	0.001	0.001	0.00102	<0.004
7	-3.01		—	✓	0.000	0.001	0.001	0.00102	
8	-4.01		—	✓	0.000	0.000	0.000	0.000124	
9	-5.01		—	✓	0.000	0.000	0.000	J	
10	-6.01		—	✓	0.000	0.003	0.003	0.00283	
11	-6.01 MS 0.05PPM		—	✓	0.000	0.056	0.056	0.0506	101% 2.1% RPD
12	-6.01 MSD ↓		—	✓	0.000	0.056	0.056	0.0506	101%
13	ICV 0.0579PPM ICB1		—	✓	0.000 0.000	0.062 0.000	0.062 0.000	0.0560 0.000	97% <0.004
14	4148-7		—	✓	0.003	0.006	0.003	0.00283	<0.004
15	-8 -9		—	✓	0.002 0.006	0.004 0.006	0.002 0.000	0.00193 0.000124	<0.004 <0.004
16	-7 LFS 0.03PPM		—	✓	0.003	0.036	0.033	0.0299	100%
17	CCV2 ICB2		—	✓	0.000 0.000	0.062 0.000	0.062 0.000	0.0560 0.000124	97% <0.004

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 5.0 ml of 524-1001001 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.0579 ppm)

MS/MSD spiked with 0.05 ml of 524-1019/001 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↓ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of ↓ @10 ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: Date/Time: 11/5/10 1800

Analyzed By: Date/Time: 11/5/10 1815

Reviewed By: Date: 11/9/10

Cr6LIQ.xls

4/8/09 SIG-04080901 ICV/LCV 1000PPM F FOR ICQ3
SV PURCHASED. INORGANIC VENTURES ICF1-1
LOT # B2-F01052
EXP: 5/1/2010

4/8/09 SIG-04080902 ICV/CCV (ICQ3) 1000PPM NO2
SV PURCHASED INORGANIC VENTURES ICNO21-1
LOT # C2-NOX02069
EXP: 5/1/10

4/8/09 SIG-04080903 NH3 FILLING SOLN
SV PURCHASED. THERMO SCIENTIFIC 951202
LOT # MT 1 P/N 70263-A04
EXP 4/8/10

4/9/09 SIG-04090901 0.1N H2SO4
SV 5.6 ml Conc H2SO4 (EMD 47050; EXP: 9/13/10) T 2L W/D
EXP: 4/9/10

4/9/09 SIG-04090902 TSS-LCS T.V= 193 mg/L
SV 0.0193g S18-09160603 (EXP: 2010) T 100 ml W/DI H2
EXP: 4/10/09

4/9/09 SIG-04090903 1000 PPM F STANDARD
SV PURCHASED. ERA CAT # 050 125ml
LOT # 200109
EXP: 1/2011

4/9/09 SIG-04090904 ICV/CCV Cr-6 Std T.V=115.8 PPM
SV PURCHASED. ERA CAT # 984
LOT # P161-984A
EXP: 12/2010

11/20/09 SIG-1120090I MBTH SOLUTION FOR O3-AIR
0.5000g MBTH (ALDRICH LOT 54696EK ; EXP: 8/31/14)
↑100ml W/DI + 0.5ml H_2SO_4 (EMD 47050; EXP: 9/13/10)
EXP: 11/21/09

11/20/09 SIG-1120090II 2N NaOH
2.00g NaOH (EMD 47022713; EXP: 10/11/12) ↑1L w/ DI H_2O
EXP: 11/2010

11/20/09 SIG-1120090III AMMONIA PH ADJUSTING ISA
Purchased
Thermo Scientific Orion 951211
LOT CODE: NW1 P/N: 207475-A01
EXP: 11/20/10

11/20/09 SIG-1120090IV pH 2.000 BUFFER
PURCHASED
BDH CAT NO 5010 - 500mL
LOT 1905343
EXP: 5/2011

11/20/09 SIG-1120090V A→E PH FILLING SOLUTION (3M KCl)
PURCHASED
Thermo Scientific 810007
LOT CODE: NQ1
EXP: 11/20/10

11/23/09 SIG-1123090I 1000PPM SO_3 (stock)
0.1591g Na_2SO_3 (JT Baker H1062-7; EXP: 8/31/14) ↑100ml W/DI H_2O
5/23/10

11/23/09 SIG-1123090Z 1000 PPM SO_3 (ICV/CCV)
SR 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A, B, C, D pH REFERENCE
SR PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 PPM SO_4 Standard
SR PURCHASED CAT # ICC-006
LOT # K00794
EXP: 9/30/13
SR 11/25/09

11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
SR ~~5.6~~ml conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~11/25~~ 9/13/10
SR 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
SR 0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
SR 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV FOR O_3 in AIR
SR 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGINC; EXP: 8/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: KL Date: 12/22/09

1/27/10 524-01271001 1000PPM SO_3 (STOCK)
$0.1591 g Na_2SO_3$ (JT Baker H20627 EXP: 8/31/14)
↑ 100ml w/ DI H_2O
EXP: 7/27/10

1/27/10 524-01271002 1000 PPM SO_3 (ICV/CCV)
$0.1607g Na_2SO_3$ (Mallinckrodt H25469, EXP: 8/11/14) ↑ 100ml w/ DI H_2O
EXP: 7/27/10

2/1/10 524-02011001 ICV/CCV Cr^{6+} Soln T.V = 0.579PPM
0.5ml 519-04090904 (115.8PPM; EXP: 12/2010) ↑ 100ml w/ DI H_2O
EXP: 2/15/10

2/1/10 524-02011002 Cr^{6+} Coloring Reagent
0.2500g Diphenylcarbohydrazide (EMD ~~47103~~ 47103721 EXP: 1/30/13) ↑ 50 ml w/Acetone (EMD 47154D; EXP: 9/24/12
EXP: 2/15/10

2/2/10 524-02021001 Cr^{6+} 1000 PPM STOCK
Purchased Inorganic Ventures CGCR(6)1-1
LOT # C2-CR03026
EXP: 3/1/11

3/1/10 SV
524-03011001 pH 4.000 Buffer
Purchased 500 ml CAT # 5657-01
JT BAKER LOT # H31526
EXP 8/31/11

3/1/10 SV
524-03011002 pH 7.000 Buffer
Purchased 500 ml CAT # 5656-01
JT BAKER LOT # H47531
EXP: 1/31/12

3/1/10 SV
524-03011003 1000 PPM Cl (LCS)
Purchased 120 ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 SV
524-03011004 NH3 Filling Sol'n
Purchased 60 ml Orion 951202
Thermo Scientific LOT # MT1
P/N: 703613-A04
EXP: 3/1/11

3/2/10 SV
524-03021001 pH 10.000 buffer
Purchased 500 ml Cat # 5655-01
JT Baker LOT H34508
EXP: 9/30/11

524-10191001 10ppm Cr6+ Soln

10/19/10 1.0ml S24-02021001 (1000ppm Cr6+; EXP: 3/1/11) ↑ 100ml w/ DI H2O
EXP: 3/1/11

10/19/10 524-10191002 ICV/CCV Cr6+ T.V = 0.579ppm
0.5ml S19-04090904 (T.V = 115.8 mg/L; EXP 12/2010)
↑ 100ml w/ DI
EXP: 11/2/10

10/19/10 524-10191003 Cr6+ Coloring Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50ml Acetone (EMD 47154; EXP: 9/24/12)
EXP: 11/2/10

10/22/10 524-10221001 25133ppb Stock 03

0.05 ml Pyridine-4-carboxaldehyde Alfa AESAR 10140598 ;Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 11/5/10

10/22/10 524-10221002 25133ppb ICV/CCV 03

0.05 ml Pyridine-4-carboxaldehyde TCI IGINC ;Exp: 8/10/12) up to 500 ml w/ DI Water.

EXP 11/05/10

10/28/10 JV — 524-10781002 — 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 JV — 524-11011001 — ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5 ml 519-04090904 (T.V = 115.8 mg/L ; EXP: 12/2010) ↑ 100 ml w/ DI

EXP: 11/15/10

11/1/10 JV — 524-11011002 — Cr^{6+} Coloring Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D; EXP. 9/24/12).

EXP: 11/15/10

LABORATORY REPORT

November 18, 2010

David Conner
Battelle
4800 Oak Grove Dr.
M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 4Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on November 4, 2010. For your reference, these analyses have been assigned our service request number P1004132.

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

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1004132
Project: JPL GW Mon 4Q10 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on November 4, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 4Q10 / G486090
Service Request: P1004132

Date Received: 11/4/2010
Time Received: 14:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-23-5	P1004132-001	Water	11/4/2010	08:23	X
MW-23-4	P1004132-002	Water	11/4/2010	08:45	X
MW-23-3	P1004132-003	Water	11/4/2010	09:04	X
MW-23-2	P1004132-004	Water	11/4/2010	09:26	X
MW-23-1	P1004132-005	Water	11/4/2010	09:58	X
DUPE-07-4Q10	P1004132-006	Water	11/4/2010	00:00	X
EB-12-11/04/10	P1004132-007	Water	11/4/2010	09:44	X

Columbia Analytical Services, Inc.

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P1004132

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE., C-205 SAN DIEGO, CA 92110	SPL GW MON 4Q10
	Project Number: G486090
Project Manager: DAVID CONNEN	P.O. # / Billing Information: 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: (619) 726-7311	Fax:
Email Address for Result Reporting	Sampler (Print & Sign): CHAS BLOOM

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr III (7198)	Remarks
MW-23-5	1	11/04/10	0823	W	1							X		
MW-23-4	2		0845		1							X		
MW-23-3	3		0904		1							X		
MW-23-2	4		0926		1							X		
MW-23-1	5		0958		1							X		
DUPE-07-4Q10	6		—		1							X		DUPLICATE
EB-12-11/04/10	7	11/04/10	0944	W	1							X		EQUIPMENT BLANK

Preservative Key

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

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

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

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	11/04/10	1130	Received by: (Signature)	11/4/10	1130
Relinquished by: (Signature)	11/4/10	1430	Received by: (Signature)	11/04/10	1430
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

5 of 22

Client: Battelle **Service Request:** P1004132
Project: JPL GW Mon 4Q10/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1004132-001.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-002.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-003.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-004.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-005.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-006.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	
P1004132-007.01					
	7196A				
		11/4/10	1501	SMO / MZAMORA	
		11/4/10	1501	P-37 / MZAMORA	
		11/4/10	1538	In Lab / SANDERSON	
		11/4/10	1752	P-37 / SANDERSON	

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Sample Acceptance Check Form

Client: Battelle Work order: P1004132

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/4/10 Date opened: 11/4/10 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004132-001.01	125mL Plastic NP					
P1004132-002.01	125mL Plastic NP					
P1004132-003.01	125mL Plastic NP					
P1004132-004.01	125mL Plastic NP					
P1004132-005.01	125mL Plastic NP					

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

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

Sample Acceptance Check Form

Client: Battelle Work order: P1004132

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/4/10 Date opened: 11/4/10 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004132-006.01	125mL Plastic NP					
P1004132-007.01	125mL Plastic NP					

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 4Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1004132
Date Collected : 11/04/10
Date Received : 11/04/10

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-5	P1004132-001	0.010	0.004	1	NA	11/04/10 17:10	ND	
MW-23-4	P1004132-002	0.010	0.004	1	NA	11/04/10 17:10	ND	
MW-23-3	P1004132-003	0.010	0.004	1	NA	11/04/10 17:10	ND	
MW-23-2	P1004132-004	0.010	0.004	1	NA	11/04/10 17:10	ND	
MW-23-1	P1004132-005	0.010	0.004	1	NA	11/04/10 17:10	ND	
DUPE-07-4Q10	P1004132-006	0.010	0.004	1	NA	11/04/10 17:10	ND	
EB-12-11/04/10	P1004132-007	0.010	0.004	1	NA	11/04/10 17:10	ND	
Method Blank	P1004132-MB	0.010	0.004	1	NA	11/04/10 17:10	ND	

Approved By Karen Rya Date : 11/5/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1004132
Project:	JPL GW Mon 4Q10 / G486090	**Date Analyzed:**	11/04/10

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

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

Approved By: Karen Ryan Date: 11/5/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 4Q10 / G486090

Service Request: P1004132
Date Analyzed: 11/04/10

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0564	97	90-110
CCV1	0.0579	0.0564	97	90-110
CCV2	0.0579	0.0564	97	90-110

Approved By: Karen Ryan Date: 11/5/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004132
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/04/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1004132-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0402	101	90-109	

Approved By Karen Rya Date : 11/5/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 4Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1004132
Date Collected : 11/04/10
Date Received : 11/04/10
Date Extracted : NA
Date Analyzed : 11/04/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-23-5
Lab Code : P1004132-001MS P1004132-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0492	0.0492	98	98	78-112	<1	

Approved By Karen Ryan Date : 11/5/10

Report By:SAnderson

Columbia Analytical Services

pH Run Log

Service Request #(s): 4132

Time: 1025

Sample	VWR lot #	Exp.
pH 2 Buffer	S19-11200904	5/2011
pH 4 Buffer	S24-03011001	8/31/11
pH 7 Buffer	S24-03011002	1/31/12
pH 10 Buffer	S24-03021001	9/30/11

Slope	Prep.Run #
97.7%	
	Run#

pH in liquid: (1) 9040B, (2) 9040C **pH in solid:** (3) 9045C, (4) 9045D (*Note method number in column labeled # below*)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	2.012	22.3°				
pH 4.000	↓	4.014	22.3				
pH 7.000		7.018	21.4°				
pH 10.000		10.022	21.5°				
Ref#: S19-11230903C 6.46 EXP:11/2012		6.410	21.8°				
DI H2O		1.951	21.5°				
pH 2.000	↓	2.014	22.2°				
TIME: 1630							
pH 2.000	5	2.008	22.5°				
4132-1.01	↓	1.887	19.2°				
-2.01		2.045	18.6°				
-3.01		1.975	18.6°				
-4.01		1.786	19.3°				
-5.01		1.791	19.1°				
-6.01		1.801	19.1°				
-7.01		1.928	19.5°				
pH 2.000	↓	2.015	22.5°				

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 DMD 44284 EXP: 11/20/14

☐ **7199A**: Diluted NaOH __________ EXP: __________

Comments: __________

Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 11/1/10

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

Analyst: [signature] Date: 11/4/10

Reviewer: KR Date: 11/5/10

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

Service Request#(s): 4132 Run#: 223870

Stock#: 524-10191001 T.V=10ppm EXP: 3/11/11 Prep Run#:

ICV/CCV#: 524-11011001 T.V=0.057ppm EXP: 11/15/10 Conc. H_2SO_4 Lot#: EA0492-84

Coloring Reagent Ref#: 524-11011002 EXP: 11/15/10

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.9999067
Absorbance @ 540 nm	0.000	0.012	0.055	0.112	

	Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	ICB	10ml	—	✓	0.000	0.000	0.000	-0.000152	<0.004
2	ICV 0.057ppm		—	✓	0.000	0.063	0.063	0.0564	97%
3	MB		—	✓	0.000	0.001	0.001	0.000745	<0.004
4	LCS 0.040ppm		—	✓	0.000	0.045	0.045	0.0402	101%
5	4132-1.01		—	✓	0.005	0.005	0.000	-0.000152	<0.004
6	-1.01 MS 0.05ppm		—	✓	0.005	0.060	0.055	0.0492	98%
7	-1.01 MSD		—	✓	0.005	0.060	0.055	0.0492	98% 0%
8	-2.01		—	✓	0.003	0.005	0.002	0.00164	<0.004
9	-2.01 LS 0.03ppm		—	✓	0.003	0.033	0.030	0.0268	89%
10	-3.01		—	✓	0.004	0.005	0.001	0.000745	<0.004
11	-4.01		—	✓	0.002	0.005	0.003	0.00254	
12	-5.01		—	✓	0.003	0.005	0.002	0.00164	
13	CCV 0.057ppm / CCB1		—	✓	0.000	0.063 / 0.000	0.063 / 0.000	0.0564 / -0.000152	97% / <0.004
14	4132-6.01		—	✓	0.003	0.003	0.000		
15	-7.01		—	✓	0.001	0.001	0.000		
16	CCV2 0.057ppm		—	✓	0.000	0.063	0.063	0.0564	97%
17	CCB2		—	✓	0.000	0.000	0.000	-0.000152	<0.004

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 5.0 ml of 524-11011001 ↑ 50 ml of pH adjusted DI WATER (T.V.=0.057ppm)

MS/MSD spiked with 0.05 ml of 524-10191001 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of @ to ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: Date/Time: 11/4/10 @ 1655

Analyzed By: Date/Time: 11/4/10 @ 1710

Reviewed By: Date: 11/5/10

Cr6LIQ.xls

4/8/09 SIG-04080901 ICV/LCV 1000PPM F FOR ICQ3
SV PURCHASED. INORGANIC VENTURES ICF1-1
LOT # B2-F01052
EXP: 5/1/2010

4/8/09 SIG-04080902 ICV/CCV (ICQ3) 1000PPM NO2
SV PURCHASED INORGANIC VENTURES ICNO21-1
LOT # C2-NOX02069
EXP: 5/1/10

4/8/09 SIG-04080903 NH3 FIELING SOLN
SV PURCHASED. THERMO SCIENTIFIC 951202
LOT # MT 1 P/N 70263-A04
EXP 4/8/10

4/9/09 SIG-04090901 0.1N H2SO4
SV 5.6ml Conc H2SO4 (EMD 47050; EXP: 9/13/10) T 2L W/DI
EXP: 4/9/10

4/9/09 SIG-04090902 TSS-LCS T.V= 193 mg/L
SV 0.0193g S18-09160603 (EXP: 2010) T 100ml W/DI H2O
EXP: 4/10/09

4/9/09 SIG-04090903 1000PPM F STANDARD
SV PURCHASED. ERA CAT # 060 125ml
LOT # 200109
EXP: 1/2011

4/9/09 SIG-04090904 ICV/CCV Cl-Ion Std T.V=115.8 PPM
SV PURCHASED. ERA CAT # 984
LOT # P161-984A
EXP: 12/2010

11/20/09 SIG-11200901 MBTH SOLUTION FOR O3-A
0.5000g MBTH (ALDRICH LOT 54696EK ; EXP: 8/31/14)
↑100 ml w/ DI + 0.5 ml H_2SO_4 (EMD 47050; EXP: 9/13/10)
EXP: 11/21/09

11/20/09 SIG-11200902 2N NaOH
2.00g NaOH (EMD 47022713; EXP: 10/11/12) ↑1L w/ DI H_2O
EXP: 11/2010

11/20/09 SIG-11200903 AMMONIA PH ADJUSTING ISA
Purchased
Thermo Scientific Orion 951211
LOT CODE: NW1 P/N: 207475-A01
EXP: 11/20/10

11/20/09 SIG-11200904 pH 2.000 BUFFER
PURCHASED
BDH CAT NO 5010 - 500mL
LOT 1905343
EXP: 5/2011

11/20/09 SIG-11200905 A→E PH FILLING SOLUTION (3M KCl)
PURCHASED
Thermo Scientific 810007
LOT CODE: NQ1
EXP: 11/20/10

11/23/09 SIG-11230901 1000PPM SO_3 (stock)
0.1591g Na_2SO_3 (JT Baker H10627, EXP: 8/31/14) ↑100 ml
w/ DI H_2O
5/23/10

11/23/09 SIG-1123090Z 1000 ppm SO_3 (ICV/CCV)
0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A, B, C, D pH REFERENCE
PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO_4 Standard
PURCHASED CAT # ICC-006
LOT # K00794
EXP: 9/30/13
Sr 11/25/09

11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
5.~~0~~ml conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~11/25~~ 9/13/10
Sr 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV FOR O_3 in Air
0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGIINC; EXP: 8/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: KL Date: 12/22/09

1/27/10 JR 524-0127001 10000ppm SO_3 (STOCK)
0.1591 g Na_2SO_3 (JT Baker H10627 EXP: 8/31/14)
↑ 100ml w/ DI H_2O
EXP: 7/27/10

1/27/10 JR 524-0127002 1000PPM SO_3 (ICV/CCV)
0.1607g Na_2SO_3 (Mallinckrodt H25469; EXP: 8/11/14) ↑ 100ml w/ DI H_2O
EXP: 7/27/10

2/1/10 JR 524-02011001 ICV/CCV Cr^{6+} Soln T.V = 0.579PPM
0.5ml SIG-04090904 (115.8ppm; EXP: 12/2010) ↑ 100ml w/ DI H_2O
EXP: 2/15/10

2/1/10 JR 524-02011002 Cr^{6+} Coloring Reagent
0.2500g Diphenylcarbohydrazide (EMD ~~47103~~ 4710372I 2/11/10
EXP: 1/30/13) ↑ 50 ml w/Acetone (EMD 471540; EXP: 9/24/12
EXP: 2/15/10

2/2/10 JR 524-02021001 Cr^{6+} 1000 PPM STOCK
Purchased Inorganic Ventures CGCR(6)I-1
LOT # C2-CR03036
EXP: 3/1/11

3/1/10 SV
524-03011001 pH 4.000 Buffer
Purchased 500 ml CAT # 5657-01
JT BAKER LOT # H31526
EXP 8/31/11

3/1/10 SV
524-03011002 pH 7.000 Buffer
Purchased 500 ml CAT # 5656-01
JT BAKER LOT # H47531
EXP: 1/31/12

3/1/10 SV
524-03011003 1000 PPM Cl (LCS)
Purchased 120 ml Cat # 1955-4
RICA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 SV
524-03011004 NH3 Filling Sol'n
Purchased 60 ml Orion 951202
Thermo Scientific LOT # MT1
P/N: 703613-A04
EXP: 3/1/11

3/2/10 SV
524-03021001 pH 10.000 buffer
Purchased 500 ml Cat # 5655-01
JT Baker LOT H34508
EXP: 9/30/11

S24-10191001 10PPM Cr^{6+} Soln

10/19/10 1.0ml S24-02021001 (1000PPM Cr^{6+}; EXP: 3/1/11) ↑ 100ml W/DI H_2O
EXP: 3/1/11

10/19/10 S24-10191002 ICV/CCV Cr^{6+} T.V=0.579PPm
0.5ml S19-04090904 (T.V= 115.8 mg/L; EXP 12/2010)
↑ 100ml W/ DI
EXP: 11/2/10

10/19/10 S24-10191003 Cr^{6+} Coloring Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50ml Acetone (EMD 47154; EXP: 9/24/12)
EXP: 11/2/10

10/22/10 S24-10221001 25133ppb Stock O_3

0.05 ml Pyridine-4-carboxaldehyde Alfa AESAR 10140598 ;Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 11/5/10

10/22/10 S24- 10221002 25133ppb ICV/CCV for O_3

0.05 ml Pyridine-4-carboxaldehyde TCI IGINC ;Exp: 8/10/12) up to 500 ml w/ DI Water.

EXP 11/05/10

10/28/10 JV — 524-10281002 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 JV — 524-11011001 ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5 ml SIG-04090604 (T.V = 115.8 mg/L ; EXP: 12/2010) ↑ 100 ml w/ DI

EXP: 11/15/10

11/1/10 JV — 524-11011002 Cr^{6+} Coloring Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 4710372I; EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D; EXP: 9/24/12).

EXP: 11/15/10

laLABORATORY REPORT

November 17, 2010

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 4Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on November 3, 2010. For your reference, these analyses have been assigned our service request number P1004112.

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

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 4Q10 / G486090

CAS Project No: P1004112

CASE NARRATIVE

The samples were received intact under chain of custody on November 3, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

DETAIL SUMMARY REPORT

Client: Battelle
Service Request: P1004112
Project ID: JPL GW Mon 4Q10 / G486090

Date Received: 11/3/2010
Time Received: 16:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-24-5	P1004112-001	Water	11/3/2010	08:43	X
MW-24-4	P1004112-002	Water	11/3/2010	09:18	X
MW-24-3	P1004112-003	Water	11/3/2010	09:46	X
MW-24-2	P1004112-004	Water	11/3/2010	10:07	X
MW-24-1	P1004112-005	Water	11/3/2010	10:30	X
DUPE-06-4Q10	P1004112-006	Water	11/3/2010	00:00	X
EB-11-11/03/10	P1004112-007	Water	11/3/2010	10:21	X

Columbia Analytical Services, Inc.

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No.: P1004112

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	Project Manager	P.O. # / Billing Information	Phone	Fax	Email Address for Result Reporting	Sampler (Print & Sign)
BATTELLE 3990 OLD TOWN AVE., C-205 SAN DIEGO, CA 92110	JPL GW MON 4Q10 ~~2Q10~~	G486090	DAVID CONNER	214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE COLUMBUS, OH 43201	(619) 726-7311			CHASE BRANNON

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Remarks
												CR VI (7196)	
MW-24-5	1	11/03/10	0843	W	1							X	
MW-24-4	2	"	0918	"	1							X	
MW-24-3	3	"	0946	"	1							X	QC LEVEL IV
MW-24-2	4	"	1007	"	1							X	
MW-24-1	5	"	1030	"	1							X	
DUPE-06-4Q10	6	"	"	"	1							X	DUPLICATE
EB-11-11/03/10	7	11/03/10	1021	W	1							X	EQUIPMENT BLANK

Preservative Key

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

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____
MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	11/03/10	1720		11/3/10	1720
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	11/3/10	1815		11/03/10	1815
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

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

5 of 22

Client: Battelle **Service Request:** P1004112
Project: JPL GW Mon 4Q10/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1004112-001.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-002.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-003.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1709	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-004.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-005.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-006.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	
P1004112-007.01					
	7196A				
		11/3/10	1657	SMO / MZAMORA	
		11/3/10	1657	P-37 / MZAMORA	
		11/3/10	1710	In Lab / SANDERSON	
		11/3/10	1821	P-37 / SANDERSON	

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Sample Acceptance Check Form

Client: Battelle Work order: P1004112

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/3/10 Date opened: 11/3/10 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004112-001.01	125mL Plastic NP					
P1004112-002.01	125mL Plastic NP					
P1004112-003.01	125mL Plastic NP					
P1004112-004.01	125mL Plastic NP					
P1004112-005.01	125mL Plastic NP					

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

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

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Sample Acceptance Check Form

Client: Battelle Work order: P1004112

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/3/10 Date opened: 11/3/10 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004112-006.01	125mL Plastic NP					
P1004112-007.01	125mL Plastic NP					

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 4Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1004112
Date Collected : 11/03/10
Date Received : 11/03/10

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-24-5	P1004112-001	0.010	0.004	1	NA	11/03/10 16:00	ND	
MW-24-4	P1004112-002	0.010	0.004	1	NA	11/03/10 16:00	ND	
MW-24-3	P1004112-003	0.010	0.004	1	NA	11/03/10 16:00	ND	
MW-24-2	P1004112-004	0.010	0.004	1	NA	11/03/10 16:00	ND	
MW-24-1	P1004112-005	0.010	0.004	1	NA	11/03/10 16:00	ND	
DUPE-06-4Q10	P1004112-006	0.010	0.004	1	NA	11/03/10 16:00	ND	
EB-11-11/03/10	P1004112-007	0.010	0.004	1	NA	11/03/10 16:00	ND	
Method Blank	P1004112-MB	0.010	0.004	1	NA	11/03/10 16:00	ND	

Approved By Karen Ryan Date : 11/4/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1004112
Project:	JPL GW Mon 4Q10 / G486090	**Date Analyzed:**	11/03/10

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

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

Approved By: Karen Ryan Date: 11/4/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1004112
Project:	JPL GW Mon 4Q10 / G486090	**Date Analyzed:**	11/03/10

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0558	96	90-110
CCV1	0.0579	0.0558	96	90-110
CCV2	0.0579	0.0558	96	90-110

Approved By: Karen Ryan Date: 11/4/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004112
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/03/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1004112-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0416	104	90-109	

Approved By Karen Ryan Date : 11/4/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004112
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	11/03/10
Project Number :	G486090	**Date Received :**	11/03/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/03/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-24-5
Lab Code : P1004112-001MS P1004112-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0522	0.0522	104	104	78-112	<1	

Approved By Karen Ryan Date : 11/4/10

Report By:SAnderson

Columbia Analytical Services™

pH Run Log

Service Request #(s): 4112

Time: 0820

Sample	VWR lot #	Exp.
pH 2 Buffer	519-11200904	5/2011
pH 4 Buffer	524-03011001	3/31/11
pH 7 Buffer	524-03011002	1/31/12
pH 10 Buffer	524-03021001	9/30/11

Slope	Prep.Run #
97.9	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C **pH in solid:** (3) 9045C, (4) 9045D (*Note method number in column labeled # below*)

pH adjustment:(5) 7196A,(6) 7199 (Note method # In column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	2.000	21.7°
pH 4.000		4.020	21.4°
pH 7.000		6.994	21.4
pH 10.000		9.992	21.8°
Ref#:519-11230903C		6.369	21.7°
DI H2O		2.057	21.0°
pH 2.000		1.990	21.6°
TIME: 1715		SR	
pH 2.000	5	2.006	22.4°
4112-1.01		1.921	9.7°
-2.01		1.827	10.2°
-3.01		1.725	11.0°
-4.01		1.878	11.4°
-5.01		1.929	12.0°
-6.01		1.728	13.0°
-7.01		1.776	13.6°
pH 2.000		2.009	22.0°

Sample	#	pH	Temp. °C

space not used

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 GMS 49284 EXP: 11/20/14

☐ **7199A**: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 11/1/10

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

Analyst: SR Date: 11/3/10

Reviewer: KR Date: 11/4/10

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

48

Service Request#(s): 4112 Run#: 223681

Stock#: S24-10191001 T.V=10PPM EXP: 3/1/11 Prep Run#: —

ICV/CCV#: S24-11011001 T.V=0.579PPM EXP: 11/15/10 Conc. H_2SO_4 Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: S24-11011002 EXP: 11/15/10

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999928427
Absorbance @ 540 nm	0.000	0.010	0.055	0.112	

	Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	ICB	10ml	—	✓	0.000	0.000	0.000	0.000638	<0.004
2	ICV 0.0579PPM		—	✓	0.000	0.062	0.062	0.0558	96%
3	MB		—	✓	0.000	0.001	0.001	0.00153	<0.004
4	LCS 0.04PPM		—	✓	0.000	0.046	0.046	0.0416	104%
5	4112-1.01		—	✓	0.000	0.002	0.002	0.00242	<0.004
6	-1.01 MS 0.05PPM		—	✓	0.000	0.058	0.058	0.0522	104% (210 RPD)
7	-1.01 MSD ↓		—	✓	0.000	0.058	0.058	0.0522	104% 0% RPD
8	-2.01		—	✓	0.003	0.004	0.001	0.00153	<0.004
9	-2.01 MS 0.03PPM		—	✓	0.003	0.032	0.029	0.0264	88%
10	-3.01		—	✓	0.004	0.006	0.002	0.00242	<0.004
11	-4.01		—	✓	0.002	0.004	0.002	↓	↓
12	-5.01		—	✓	0.004	0.004	0.000	0.000638	96%
13	CCV1 0.0579PPM		—	✓	0.000	0.062	0.062	0.0558	<0.004
14	CCB1		—	✓	0.000	0.000	0.000	0.000638	
15	4112-6.01		—	✓	0.005	0.007	0.002	0.00242	↓
16	↓ -7.01		—	✓	0.000	0.000	0.000	0.000638	96%
17	CCV2 0.0579PPM		—	✓	0.000	0.062	0.062	0.0558	<0.004
18	CCB2	↓	—	✓	0.000	0.000	0.000	0.000638	

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 5.0 ml of S24-11011001 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.0579 ppm)

MS/MSD spiked with 0.05 ml of S24-10191001 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↓ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of @ 1/10 ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: Date/Time: 11/3/10 @1745

Analyzed By: Date/Time: 11/3/10 @ 1800

Reviewed By: Date: 11/4/10

Cr6LIQ.xls

4/8/09 SIG-04080901 ICV/LCV 1000PPM F FOR ICO3
SV PURCHASED. INORGANIC VENTURES ICF1-1
LOT # B2-F01052
EXP: 5/1/2010

4/8/09 SIG-04080902 ICV/CCV (ICO3) 1000PPM NO2
SV PURCHASED INORGANIC VENTURES ICN021-1
LOT # C2-NOX02069
EXP: 5/1/10

4/8/09 SIG-04080903 NH3 FIELING SOLN
SV PURCHASED. THERMO SCIENTIFIC 951202
LOT # MT1 P/N 70213-A04
EXP 4/8/10

4/9/09 SIG-04090901 0.1N H2SO4
SV 5.6 ml Conc H2SO4 (EMD 47050; EXP: 9/13/10) T 2L W/D
EXP: 4/9/10

4/9/09 SIG-04090902 TSS-LCS T.V= 193 mg/L
SV 0.0193g S18-09160603 (EXP: 2010) T 100 ml W/ DI H2
EXP: 4/10/09

4/9/09 SIG-04090903 1000 PPM F STANDARD
SV PURCHASED. ERA CAT # 060 125ml
LOT # 200109
EXP: 1/2011

4/9/09 SIG-04090904 ICV/CCV Cr-6 Std T.V=115.8 PPM
SV PURCHASED. ERA CAT # 984
LOT # P161-984A
EXP: 12/2010

11/20/09 SIG-11200901 MBTH SOLUTION FOR O3-A
0.5000g MBTH (ALDRICH LOT 54696EK; EXP: 8/14) T 100 ml w/ DI + 0.5 ml H_2SO_4 (EMD 47050; EXP: 9/13/10)
EXP: 11/21/09

11/20/09 SIG-11200902 2N NaOH
2.00g NaOH (EMD 47022713; EXP: 10/11/12) T 1L w/ DI H_2O
EXP: 11/2010

11/20/09 SIG-11200903 AMMONIA PH ADJUSTING ISA
Purchased
Thermo Scientific Orion 951211
LOT CODE: NW1 P/N: 207475-A01
EXP: 11/20/10

11/20/09 SIG-11200904 pH 2.000 BUFFER
PURCHASED
BDH CAT NO 5010 - 500mL
LOT 1905343
EXP: 5/2011

11/20/09 SIG-11200905 A→E PH FILLING SOLUTION (3M KCl)
PURCHASED 810007
Thermo Scientific
LOT CODE: NQ1
EXP: 11/20/10

11/23/09 SIG-11230901 1000PPM SO_3 (stock)
0.1591g Na_2SO_3 (JT Baker H10627, EXP: 8/31/14) T 100 ml w/ DI H_2O
5/23/10

11/23/09 SIG-1123090Z 1000 PPM SO_3 (ICV/CCV)
0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A,B,C,D PH REFERENCE
PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 PPM SO_4 Standard
PURCHASED CAT # ICC-006
LOT # K007794
EXP: 9/30/13
Sr 11/25/09

11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
5.6ml conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~9/13/10~~ 9/13/10
Sr 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV FOR O_3 in Air
0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGIINC; EXP: 8/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: KL Date: 12/22/09

1/27/10 524-0127001 10000PPM SO_3 (STOCK)
JR 0.1541 g Na_2SO_3 (JT Baker H10627 EXP: 8/31/14)
↑ 100ml w/ DI H_2O
EXP: 7/27/10

1/27/10 524-0127002 1000PPM SO_3 (ICV/CCV)
JR 0.1607g Na_2SO_3 (Mallinckrodt H25469; EXP: 8/11/14) ↑ 100ml w/ DI H_2O
EXP: 7/27/10

2/1/10 524-02011001 ICV/CCV Cr^{6+} Soln T.V = 0.579PPM
JR 0.5ml 519-04090904 (115.8 PPM; EXP: 12/2010) ↑ 100ml w/ DI H_2O
EXP: 2/15/10

2/1/10 524-02011002 Cr^{6+} Coloring Reagent
JR 0.2500g Diphenylcarbohydrazide (EMD ~~47103~~ 4710373I Sm 2/11/10
EXP: 1/30/13) ↑ 50 ml w/Acetone (EMD 471540; EXP: 9/24/12
EXP: 2/15/10

2/2/10 524-02021001 Cr^{6+} 1000 PPM STOCK
JR Purchased Inorganic Ventures CGCR(6)I-1
LOT # C2-CR03036
EXP: 3/1/11

3/1/10 SV
524-03011001 pH 4.000 Buffer
Purchased 500 ml CAT # 5657-01
JT BAKER LOT # H31526
EXP 8/31/11

3/1/10 SV
524-03011002 pH 7.000 Buffer
Purchased 500 ml CAT # 5656-01
JT BAKER LOT # H47531
EXP: 1/31/12

3/1/10 SV
524-03011003 1000 PPM Cl (LCS)
Purchased 120 ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 SV
524-03011004 NH3 Filling Sol'n
Purchased 60 ml Order 95130 2
Thermo Scientific LOT # MT1
P/N: 703613-A04
EXP: 3/1/11

3/2/10 SV
524-03021001 pH 10.000 buffer
Purchased 500 ml Cat # 5655-01
JT Baker LOT H34508
EXP: 9/30/11

524-10191001 10ppm Cr6+ Soln

10/19/10 1.0 ml S24-0202 1001 (1000ppm Cr6+; EXP: 3/1/11) ↑ 100ml w/ DI H2O
EXP: 3/1/11

10/19/10 524-10191002 ICV/CCV Cr6+ T.V = 0.579ppm
0.5ml S19-04090904 (T.V = 115.8 mg/L; EXP 12/2010)
↑ 100ml w/ DI
EXP: 11/2/10

10/19/10 524-10191003 Cr6+ Coloring Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD 4710372I; EXP: 1/30/13) ↑ 50ml Acetone (EMD 47154; EXP: 9/24/12)
EXP: 11/2/10

10/22/10 524-1022 1001 25133ppb Stock 03

0.05 ml Pyridine-4-carboxaldehyde Alfa AESAR 10140598 ;Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 11/5/10

10/22/10 524-1022 1002 25133ppb ICV/CCV for 03

0.05 ml Pyridine-4-carboxaldehyde TCI IGENC ;Exp: 8/10/12) up to 500 ml w/ DI Water.

EXP 11/05/10

10/28/10 Jv

S24-10281002 1000 PPM SO3 ICV/CCV

0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 Jv

S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 PPM

0.5 ml S19-04090904 (T.V = 115.8 mg/L ; EXP: 12/2010)

↑ 100 ml w/ DI

EXP: 11/15/10

11/1/10 Jv

S24-11011002 Cr^{6+} Coloring Reagent

0.2500 g 1,5-Diphenylcarbohydrazide (EMD 47103731; EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D; EXP: 9/24/12).

EXP: 11/15/10

LABORATORY REPORT

November 17, 2010

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 4Q10 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on November 2, 2010. For your reference, these analyses have been assigned our service request number P1004082.

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

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1004082
Project: JPL GW Mon 4Q10 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on November 2, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 4Q10 / G486090
Service Request: P1004082

Date Received: 11/2/10
Time Received: 14:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-12-5	P1004082-001	Water	11/2/10	08:43	X
MW-12-4	P1004082-002	Water	11/2/10	09:07	X
MW-12-3	P1004082-003	Water	11/2/10	09:39	X
MW-12-2	P1004082-004	Water	11/2/10	10:10	X
MW-12-1	P1004082-005	Water	11/2/10	10:34	X
DUPE-05-4Q10	P1004082-006	Water	11/2/10	00:00	X
EB-10-11/02/10	P1004082-007	Water	11/2/10	10:23	X

Columbia Analytical Services, Inc.

Acronyms

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

Qualifiers

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

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P1004052

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE., C-205 SAN DIEGO, CA 92110	SPL GW MON 4Q10
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: (614) 726-7311	Fax:
Email Address for Result Reporting	Sampler (Print & Sign): CHASE BROSTON

Analysis Method and/or Analytes

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	Preservative Code: 0	Remarks
MW-12-5		11/02/10	0843	W	1						X	
MW-12-4			0907		1						X	
MW-12-3			0939		1						X	
MW-12-2			1010		1						X	
MW-12-1			1034		1						X	
DUPE-05-4Q10			—		1						X	DUPLICATE
EB-10-11/02/10		11/02/10	1023	W	1						X	EQUIPMENT BLANK

Preservative Key

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

Cr III (7196)

5 of 22

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

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

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	11/04/10	1230	Received by: (Signature)	11/4/10	1230
Relinquished by: (Signature)	11/2/10	1415	Received by: (Signature)	11/2/10	1415
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3°C °C

Client: Battelle **Service Request:** P1004082
Project: JPL GW Mon 4Q10/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1004082-001.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1501	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-002.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-003.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-004.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-005.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-006.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	
P1004082-007.01					
	7196A				
		11/2/10	1446	SMO / MZAMORA	
		11/2/10	1447	P-37 / MZAMORA	
		11/2/10	1502	In Lab / SANDERSON	
		11/2/10	1611	P-37 / SANDERSON	

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Sample Acceptance Check Form

Client: Battelle Work order: P1004082

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/2/10 Date opened: 11/2/10 by: MZAMORA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004082-001.01	125mL Plastic NP					
P1004082-002.01	125mL Plastic NP					
P1004082-003.01	125mL Plastic NP					
P1004082-004.01	125mL Plastic NP					
P1004082-005.01	125mL Plastic NP					

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

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

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Sample Acceptance Check Form

Client: Battelle Work order: P1004082

Project: JPL GW Mon 4Q10 / G486090

Sample(s) received on: 11/2/10 Date opened: 11/2/10 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1004082-006.01	125mL Plastic NP					
P1004082-007.01	125mL Plastic NP					

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 4Q10
Project Number : G486090
Sample Matrix : WATER

Service Request : P1004082
Date Collected : 11/02/10
Date Received : 11/02/10

Chromium, Hexavalent

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

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-5	P1004082-001	0.010	0.004	1	NA	11/02/10 15:45	ND	
MW-12-4	P1004082-002	0.010	0.004	1	NA	11/02/10 15:45	ND	
MW-12-3	P1004082-003	0.010	0.004	1	NA	11/02/10 15:45	ND	
MW-12-2	P1004082-004	0.010	0.004	1	NA	11/02/10 15:45	ND	
MW-12-1	P1004082-005	0.010	0.004	1	NA	11/02/10 15:45	ND	
DUPE-05-4Q10	P1004082-006	0.010	0.004	1	NA	11/02/10 15:45	ND	
EB-10-11/02/10	P1004082-007	0.010	0.004	1	NA	11/02/10 15:45	ND	
Method Blank	P1004082-MB	0.010	0.004	1	NA	11/02/10 15:45	ND	

Approved By Karen Rya Date : 11/3/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 4Q10 / G486090

Service Request: P1004082
Date Analyzed: 11/02/10

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

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

Approved By: Karen Ryan Date: 11/3/10

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 4Q10 / G486090

Service Request: P1004082
Date Analyzed: 11/02/10

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0593	102	90-110
CCV1	0.0579	0.0576	99	90-110
CCV2	0.0579	0.0576	99	90-110

Approved By: Karen Rya Date: 11/3/10

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004082
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/02/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1004082-LCS	Basis :	NA
Test Notes :			

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

Approved By Karen Ryan Date : 11/3/10

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1004082
Project Name :	JPL GW Mon 4Q10	**Date Collected :**	11/02/10
Project Number :	G486090	**Date Received :**	11/02/10
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	11/02/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-12-5
Lab Code : P1004082-001MS P1004082-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0505	0.0505	101	101	78-112	<1	

Approved By Karen Ryan Date : 11/3/10

Report By:SAnderson