

### **ATTACHMENT 3: LABORATORY ANALYTICAL REPORTS**

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This attachment contains the laboratory analytical reports prepared by Alpha Analytical Inc. of Sparks, Nevada and Columbia Analytical Services (CAS) of Simi Valley, California.



# Alpha Analytical, Inc.

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

Date: 07-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11082403

Cooler Temp: 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11082403-01A	MW-19-5	Aqueous
11082403-02A	MW-19-4	Aqueous
11082403-03A	MW-19-3	Aqueous
11082403-04A	MW-19-2	Aqueous
11082403-05A	MW-19-1	Aqueous
11082403-06A	DUPE-01-3Q11	Aqueous
11082403-07A	EB-01-8/23/11	Aqueous
11082403-08A	TB-01-8/23/11	Aqueous
11082403-09A	SB-01-8/23/11	Aqueous
11082403-10A	MW-7	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11082403-01A	EPA Method 314.0	Perchlorate
11082403-02A	EPA Method 314.0	Perchlorate
11082403-03A	EPA Method 314.0	Perchlorate
11082403-04A	EPA Method 314.0	Perchlorate
11082403-05A	EPA Method 314.0	Perchlorate
11082403-06A	EPA Method 314.0	Perchlorate
11082403-10A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/24/11

Job: 100006114/JPL Groundwater Monitoring

Anions by IC  
EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-7				
Lab ID: BMII1082403-10A Chloride	60	0.50 mg/L	08/24/11 12:11	08/24/11 13:08
Date Sampled 08/23/11 10:35 Nitrite (NO2) - N	ND	0.25 mg/L	08/24/11 12:11	08/24/11 13:08
Nitrate (NO3) - N	1.8	0.25 mg/L	08/24/11 12:11	08/24/11 13:08
Phosphate, ortho - P	ND	0.50 mg/L	08/24/11 12:11	08/24/11 13:08
Sulfate (SO4)	45	0.50 mg/L	08/24/11 12:11	08/24/11 13:08

ND = Not Detected

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Report Date



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Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/24/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-19-5</b> Lab ID : BM11082403-01A Perchlorate Date Sampled 08/23/11 09:29	2.32	1.00 µg/L	08/31/11 11:06	08/31/11 13:04
Client ID: <b>MW-19-4</b> Lab ID : BM11082403-02A Perchlorate Date Sampled 08/23/11 09:58	2.20	1.00 µg/L	08/31/11 11:06	08/31/11 13:23
Client ID: <b>MW-19-3</b> Lab ID : BM11082403-03A Perchlorate Date Sampled 08/23/11 10:21	3.25	1.00 µg/L	08/31/11 11:06	08/31/11 13:41
Client ID: <b>MW-19-2</b> Lab ID : BM11082403-04A Perchlorate Date Sampled 08/23/11 10:52	5.00	1.00 µg/L	08/31/11 11:06	08/31/11 13:59
Client ID: <b>MW-19-1</b> Lab ID : BM11082403-05A Perchlorate Date Sampled 08/23/11 11:36	1.81	1.00 µg/L	08/31/11 11:06	08/31/11 14:55
Client ID: <b>DUPE-01-3Q11</b> Lab ID : BM11082403-06A Perchlorate Date Sampled 08/23/11 00:00	2.14	1.00 µg/L	08/31/11 11:06	08/31/11 15:13
Client ID: <b>EB-01-8/23/11</b> Lab ID : BM11082403-07A Perchlorate Date Sampled 08/23/11 11:20	ND	1.00 µg/L	08/31/11 11:06	08/31/11 15:31
Client ID: <b>SB-01-8/23/11</b> Lab ID : BM11082403-09A Perchlorate Date Sampled 08/23/11 11:29	ND	1.00 µg/L	08/31/11 11:06	08/31/11 15:50
Client ID: <b>MW-7</b> Lab ID : BM11082403-10A Perchlorate Date Sampled 08/23/11 10:35	10.2	1.00 µg/L	08/31/11 11:06	08/31/11 16:08



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---

ND = Not Detected

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*Randy Gardner*

*Walter Hinchman*

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*9/11*

**Report Date**



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/24/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>EB-01-8/23/11</b>				
Lab ID : BM111082403-07A Chromium (Cr) Date Sampled 08/23/11 11:20	ND	0.0050 mg/L	08/25/11	08/29/11
Client ID: <b>SB-01-8/23/11</b>				
Lab ID : BM111082403-09A Chromium (Cr) Date Sampled 08/23/11 11:29	ND	0.0050 mg/L	08/25/11	08/29/11
Client ID: <b>MW-7</b>				
Lab ID : BM111082403-10A Chromium (Cr) Date Sampled 08/23/11 10:35	0.079	0.0050 mg/L	08/25/11	08/29/11

ND = Not Detected

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Battelle Memorial Institute  
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San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-19-5</b> Lab ID: BMI11082403-01A Date Received: 08/24/11 Date Sampled: 08/23/11 09:29	*** None Found ***	ND	08/25/11 13:16	08/25/11 13:16
Client ID: <b>MW-19-4</b> Lab ID: BMI11082403-02A Date Received: 08/24/11 Date Sampled: 08/23/11 09:58	*** None Found ***	ND	08/25/11 13:59	08/25/11 13:59
Client ID: <b>MW-19-3</b> Lab ID: BMI11082403-03A Date Received: 08/24/11 Date Sampled: 08/23/11 10:21	*** None Found ***	ND	08/25/11 14:21	08/25/11 14:21
Client ID: <b>MW-19-2</b> Lab ID: BMI11082403-04A Date Received: 08/24/11 Date Sampled: 08/23/11 10:52	*** None Found ***	ND	08/25/11 14:42	08/25/11 14:42
Client ID: <b>MW-19-1</b> Lab ID: BMI11082403-05A Date Received: 08/24/11 Date Sampled: 08/23/11 11:36	*** None Found ***	ND	08/25/11 15:04	08/25/11 15:04
Client ID: <b>DUPE-01-3Q11</b> Lab ID: BMI11082403-06A Date Received: 08/24/11 Date Sampled: 08/23/11 00:00	*** None Found ***	ND	08/25/11 15:25	08/25/11 15:25
Client ID: <b>EB-01-8/23/11</b> Lab ID: BMI11082403-07A Date Received: 08/24/11 Date Sampled: 08/23/11 11:20	*** None Found ***	ND	08/25/11 12:32	08/25/11 12:32
Client ID: <b>TB-01-8/23/11</b> Lab ID: BMI11082403-08A Date Received: 08/24/11 Date Sampled: 08/23/11 07:00	*** None Found ***	ND	08/25/11 12:11	08/25/11 12:11
Client ID: <b>SB-01-8/23/11</b> Lab ID: BMI11082403-09A Date Received: 08/24/11 Date Sampled: 08/23/11 11:29	*** None Found ***	ND	08/25/11 12:54	08/25/11 12:54



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Client ID : MW-7  
Lab ID : BMI11082403-10A \*\*\* None Found \*\*\* ND 2.0 µg/L 08/25/11 15:47 08/25/11 15:47  
Date Received : 08/24/11  
Date Sampled : 08/23/11 10:35

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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## ANALYTICAL REPORT

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655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-01A  
Client I.D. Number: MW-19-5

Sampled: 08/23/11 09:29  
Received: 08/24/11  
Extracted: 08/25/11 13:16  
Analyzed: 08/25/11 13:16

### Volatile Organics by GC/MS EPA Method SW8260B

Reporting			Reporting		
Compound	Concentration	Limit	Compound	Concentration	Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	112	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	91	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	0.89	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

ND = Not Detected

*Roger Scholl*

*Randy Gardner*

*Walter Hinchman*

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-02A  
Client I.D. Number: MW-19-4

Sampled: 08/23/11 09:58  
Received: 08/24/11  
Extracted: 08/25/11 13:59  
Analyzed: 08/25/11 13:59

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	111	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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*PS*  
9/7/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-03A  
Client I.D. Number: MW-19-3

Sampled: 08/23/11 10:21  
Received: 08/24/11  
Extracted: 08/25/11 14:21  
Analyzed: 08/25/11 14:21

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethane	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethane	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethane	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	113	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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.

9/7/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-04A  
Client I.D. Number: MW-19-2

Sampled: 08/23/11 10:52  
Received: 08/24/11  
Extracted: 08/25/11 14:42  
Analyzed: 08/25/11 14:42

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	113	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	1.4	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	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.

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*PS*  
9/7/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-05A  
Client I.D. Number: MW-19-1

Sampled: 08/23/11 11:36  
Received: 08/24/11  
Extracted: 08/25/11 15:04  
Analyzed: 08/25/11 15:04

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethane	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethane	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethane	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	113	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	97	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	89	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	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.

*PS*  
9/7/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-06A  
Client I.D. Number: DUPE-01-3Q11

Sampled: 08/23/11 00:00  
Received: 08/24/11  
Extracted: 08/25/11 15:25  
Analyzed: 08/25/11 15:25

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	112	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

*Roger Scholl*

*Randy Gardner*

*Walter Hinchman*

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

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*JSG*

9/7/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-07A  
Client I.D. Number: EB-01-8/23/11

Sampled: 08/23/11 11:20  
Received: 08/24/11  
Extracted: 08/25/11 12:32  
Analyzed: 08/25/11 12:32

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	108	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	97	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	91	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

9/7/11

Report Date

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

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-08A  
Client I.D. Number: TB-01-8/23/11

Sampled: 08/23/11 07:00  
Received: 08/24/11  
Extracted: 08/25/11 12:11  
Analyzed: 08/25/11 12:11

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	109	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	91	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/7/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-09A  
Client I.D. Number: SB-01-8/23/11

Sampled: 08/23/11 11:29  
Received: 08/24/11  
Extracted: 08/25/11 12:54  
Analyzed: 08/25/11 12:54

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethene	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethene	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethene	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	ND	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	112	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	96	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	ND	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	ND	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

9/7/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082403-10A  
Client I.D. Number: MW-7

Sampled: 08/23/11 10:35  
Received: 08/24/11  
Extracted: 08/25/11 15:47  
Analyzed: 08/25/11 15:47

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	0.50 µg/L	45 1,1,2,2-Tetrachloroethane	ND	0.50 µg/L
2 Chloromethane	ND	1.0 µg/L	46 1,2,3-Trichloropropane	ND	1.0 µg/L
3 Vinyl chloride	ND	0.50 µg/L	47 Isopropylbenzene	ND	0.50 µg/L
4 Chloroethane	ND	0.50 µg/L	48 Bromobenzene	ND	0.50 µg/L
5 Bromomethane	ND	1.0 µg/L	49 n-Propylbenzene	ND	0.50 µg/L
6 Trichlorofluoromethane	ND	0.50 µg/L	50 4-Chlorotoluene	ND	0.50 µg/L
7 Acetone	ND	10 µg/L	51 2-Chlorotoluene	ND	0.50 µg/L
8 1,1-Dichloroethane	ND	0.50 µg/L	52 1,3,5-Trimethylbenzene	ND	0.50 µg/L
9 Dichloromethane	ND	1.0 µg/L	53 tert-Butylbenzene	ND	0.50 µg/L
10 Freon-113	ND	0.50 µg/L	54 1,2,4-Trimethylbenzene	ND	0.50 µg/L
11 trans-1,2-Dichloroethane	ND	0.50 µg/L	55 sec-Butylbenzene	ND	0.50 µg/L
12 Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	56 1,3-Dichlorobenzene	ND	0.50 µg/L
13 1,1-Dichloroethane	ND	0.50 µg/L	57 1,4-Dichlorobenzene	ND	0.50 µg/L
14 2-Butanone (MEK)	ND	10 µg/L	58 4-Isopropyltoluene	ND	0.50 µg/L
15 cis-1,2-Dichloroethane	ND	0.50 µg/L	59 1,2-Dichlorobenzene	ND	0.50 µg/L
16 Bromochloromethane	ND	0.50 µg/L	60 n-Butylbenzene	ND	0.50 µg/L
17 Chloroform	11	0.50 µg/L	61 1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5 µg/L
18 2,2-Dichloropropane	ND	0.50 µg/L	62 1,2,4-Trichlorobenzene	ND	1.0 µg/L
19 1,2-Dichloroethane	ND	0.50 µg/L	63 Naphthalene	ND	1.0 µg/L
20 1,1,1-Trichloroethane	ND	0.50 µg/L	64 Hexachlorobutadiene	ND	1.0 µg/L
21 1,1-Dichloropropene	ND	0.50 µg/L	65 1,2,3-Trichlorobenzene	ND	1.0 µg/L
22 Carbon tetrachloride	ND	0.50 µg/L	66 Surr: 1,2-Dichloroethane-d4	112	(70-130) %REC
23 Benzene	ND	0.50 µg/L	67 Surr: Toluene-d8	97	(70-130) %REC
24 Dibromomethane	ND	0.50 µg/L	68 Surr: 4-Bromofluorobenzene	90	(70-130) %REC
25 1,2-Dichloropropane	ND	0.50 µg/L			
26 Trichloroethene	ND	0.50 µg/L			
27 Bromodichloromethane	1.2	0.50 µg/L			
28 4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L			
29 cis-1,3-Dichloropropene	ND	0.50 µg/L			
30 trans-1,3-Dichloropropene	ND	0.50 µg/L			
31 1,1,2-Trichloroethane	ND	0.50 µg/L			
32 Toluene	ND	0.50 µg/L			
33 1,3-Dichloropropane	ND	0.50 µg/L			
34 2-Hexanone	ND	5.0 µg/L			
35 Dibromochloromethane	ND	0.50 µg/L			
36 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
37 Tetrachloroethene	ND	0.50 µg/L			
38 1,1,1,2-Tetrachloroethane	ND	0.50 µg/L			
39 Chlorobenzene	ND	0.50 µg/L			
40 Ethylbenzene	ND	0.50 µg/L			
41 m,p-Xylene	ND	0.50 µg/L			
42 Bromoform	ND	0.50 µg/L			
43 Styrene	ND	0.50 µg/L			
44 o-Xylene	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.

*PG*  
9/7/11

Report Date



# Alpha Analytical, Inc.

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

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## VOC Sample Preservation Report

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**Work Order:** BMI11082403

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11082403-01A	MW-19-5	Aqueous	2
11082403-02A	MW-19-4	Aqueous	2
11082403-03A	MW-19-3	Aqueous	2
11082403-04A	MW-19-2	Aqueous	2
11082403-05A	MW-19-1	Aqueous	2
11082403-06A	DUPE-01-3Q11	Aqueous	2
11082403-07A	EB-01-8/23/11	Aqueous	2
11082403-08A	TB-01-8/23/11	Aqueous	2
11082403-09A	SB-01-8/23/11	Aqueous	2
11082403-10A	MW-7	Aqueous	2

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9/7/11  
**Report Date**

Page 1 of 1



# Alpha Analytical, Inc.

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

Date:  
26-Aug-11

## QC Summary Report

Work Order:  
11082403

### Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0**

File ID: **20**

Batch ID: **27177**

Analysis Date: **08/24/2011 12:12**

Sample ID: **MB-27177**

Units : **mg/L**

Run ID: **IC\_1\_110824A**

Prep Date: **08/24/2011 12:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

### Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0**

File ID: **21**

Batch ID: **27177**

Analysis Date: **08/24/2011 12:31**

Sample ID: **LFB-27177**

Units : **mg/L**

Run ID: **IC\_1\_110824A**

Prep Date: **08/24/2011 12:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	48.4	0.5	50		97	90	110			
Nitrite (NO2) - N	4.82	0.25	5		96	90	110			
Nitrate (NO3) - N	5.2	0.25	5		104	90	110			
Phosphate, ortho - P	5.45	0.5	5		109	90	110			
Sulfate (SO4)	100	0.5	100		100	90	110			

### Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0**

File ID: **28**

Batch ID: **27177**

Analysis Date: **08/24/2011 14:41**

Sample ID: **11082403-10ALFM**

Units : **mg/L**

Run ID: **IC\_1\_110824A**

Prep Date: **08/24/2011 12:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	104	0.5	50	60.29	87	80	120			
Nitrite (NO2) - N	5.15	0.25	5	0	103	80	120			
Nitrate (NO3) - N	6.74	0.25	5	1.779	99	80	120			
Phosphate, ortho - P	6.01	0.5	5	0	120	80	120			
Sulfate (SO4)	142	0.5	100	45.29	97	80	120			

### Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0**

File ID: **29**

Batch ID: **27177**

Analysis Date: **08/24/2011 14:59**

Sample ID: **11082403-10ALFMD**

Units : **mg/L**

Run ID: **IC\_1\_110824A**

Prep Date: **08/24/2011 12:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	105	0.5	50	60.29	90	80	120	103.7	1.5(15)	
Nitrite (NO2) - N	5.01	0.25	5	0	100	80	120	5.151	2.7(15)	
Nitrate (NO3) - N	6.82	0.25	5	1.779	101	80	120	6.738	1.3(15)	
Phosphate, ortho - P	6.16	0.5	5	0	123	80	120	6.014	2.4(15)	M1
Sulfate (SO4)	143	0.5	100	45.29	98	80	120	142.1	0.6(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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.



# Alpha Analytical, Inc.

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

Date:  
06-Sep-11

## QC Summary Report

Work Order:  
11082403

### Method Blank

File ID: 14	Type: <b>MBLK</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27222</b>	Analysis Date: <b>08/31/2011 12:09</b>						
Sample ID: <b>MB-27222</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110831A</b>	Prep Date: <b>08/31/2011 11:06</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND		1							

### Laboratory Fortified Blank

File ID: 15	Type: <b>LFB</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27222</b>	Analysis Date: <b>08/31/2011 12:27</b>						
Sample ID: <b>LFB-27222</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110831A</b>	Prep Date: <b>08/31/2011 11:06</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.3	2	25		97	85	115			

### Sample Matrix Spike

File ID: 21	Type: <b>LFM</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27222</b>	Analysis Date: <b>08/31/2011 14:18</b>						
Sample ID: <b>11082403-04ALFM</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110831A</b>	Prep Date: <b>08/31/2011 11:06</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	26.4	2	25	4.997	86	80	120			

### Sample Matrix Spike Duplicate

File ID: 22	Type: <b>LFMD</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27222</b>	Analysis Date: <b>08/31/2011 14:36</b>						
Sample ID: <b>11082403-04ALFMD</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110831A</b>	Prep Date: <b>08/31/2011 11:06</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	27.1	2	25	4.997	89	80	120	26.42	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:  
07-Sep-11

## QC Summary Report

Work Order:  
11082403

### Method Blank

File ID:	Type	Test Code:								
082911.B\071_M.D\	MBLK	EPA Method 200.8								
Sample ID: MB-27185	Units : mg/L	Run ID: ICP/MS_110829C	Batch ID: 27185	Analysis Date: 08/29/2011 20:31						
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								

### Laboratory Control Spike

File ID:	Type	Test Code:								
082911.B\072_M.D\	LCS	EPA Method 200.8								
Sample ID: LCS-27185	Units : mg/L	Run ID: ICP/MS_110829C	Batch ID: 27185	Analysis Date: 08/29/2011 20:37						
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0507	0.005	0.05		101	85	115			

### Sample Matrix Spike

File ID:	Type	Test Code:								
082911.B\128_S8.D\	MS	EPA Method 200.8								
Sample ID: 11082501-04AMS	Units : mg/L	Run ID: ICP/MS_110829C	Batch ID: 27185	Analysis Date: 08/30/2011 14:48						
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0481	0.005	0.05	0	96	70	130			

### Sample Matrix Spike Duplicate

File ID:	Type	Test Code:								
082911.B\078_M.D\	MSD	EPA Method 200.8								
Sample ID: 11082501-04AMSD	Units : mg/L	Run ID: ICP/MS_110829C	Batch ID: 27185	Analysis Date: 08/29/2011 21:12						
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0395	0.005	0.05	0	79	70	130	0.0481	19.8(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:**

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## QC Summary Report

**Work Order:**

11082403

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Surr: 1,2-Dichloroethane-d4	10.3	10	103	70	130
Surr: Toluene-d8	9.62	10	96	70	130
Surr: 4-Bromofluorobenzene	9.49	10	95	70	130





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Date:  
07-Sep-11

## QC Summary Report

Work Order:  
11082403

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11082504.D

Batch ID: MS15W0825M

Analysis Date: 08/25/2011 09:45

Sample ID: LCS MS15W0825M

Units : µg/L

Run ID: MSD\_15\_110825B

Prep Date: 08/25/2011 09:45

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.96	1	10		90	70	130			
Chloromethane	12	2	10		120	70	130			
Vinyl chloride	10.1	1	10		101	70	130			
Chloroethane	12.3	1	10		123	70	130			
Bromomethane	8.97	2	10		90	70	130			
Trichlorofluoromethane	11	1	10		110	70	130			
Acetone	246	10	200		123	36	171			
1,1-Dichloroethene	9.46	1	10		95	70	130			
Dichloromethane	9.33	2	10		93	70	130			
Freon-113	10.3	1	10		103	70	137			
trans-1,2-Dichloroethene	9.97	1	10		99.7	70	130			
Methyl tert-butyl ether (MTBE)	10	0.5	10		100	70	130			
1,1-Dichloroethane	9.94	1	10		99	70	130			
2-Butanone (MEK)	239	10	200		119	70	130			
cis-1,2-Dichloroethene	9.94	1	10		99	70	130			
Bromochloromethane	9.97	1	10		99.7	70	130			
Chloroform	9.97	1	10		99.7	70	130			
2,2-Dichloropropane	10.4	1	10		104	70	130			
1,2-Dichloroethane	10.1	1	10		101	70	130			
1,1,1-Trichloroethane	10.4	1	10		104	70	130			
1,1-Dichloropropene	10.5	1	10		105	70	130			
Carbon tetrachloride	10.1	1	10		101	70	130			
Benzene	10.2	0.5	10		102	70	130			
Dibromomethane	9.96	1	10		99.6	70	130			
1,2-Dichloropropane	9.81	1	10		98	70	130			
Trichloroethene	9.98	1	10		99.8	70	130			
Bromodichloromethane	10	1	10		100	70	130			
4-Methyl-2-pentanone (MIBK)	27.2	2.5	25		109	20	182			
cis-1,3-Dichloropropene	9.83	1	10		98	70	130			
trans-1,3-Dichloropropene	9.07	1	10		91	70	130			
1,1,2-Trichloroethane	9.95	1	10		100	70	130			
Toluene	10.1	0.5	10		101	70	130			
1,3-Dichloropropane	9.59	1	10		96	70	130			
2-Hexanone	98.7	5	100		99	20	182			
Dibromochloromethane	8.56	1	10		86	70	130			
1,2-Dibromoethane (EDB)	19.5	2	20		97	70	130			
Tetrachloroethene	10	1	10		100	70	130			
1,1,1,2-Tetrachloroethane	9.98	1	10		99.8	70	130			
Chlorobenzene	9.69	1	10		97	70	130			
Ethylbenzene	10.6	0.5	10		106	70	130			
m,p-Xylene	10.5	0.5	10		105	70	130			
Bromoform	8.48	1	10		85	70	130			
Styrene	9.16	1	10		92	70	130			
o-Xylene	10.5	0.5	10		105	70	130			
1,1,2,2-Tetrachloroethane	9.05	1	10		91	70	130			
1,2,3-Trichloropropane	19	2	20		95	70	130			
Isopropylbenzene	9.88	1	10		99	70	130			
Bromobenzene	9.99	1	10		99.9	70	130			
n-Propylbenzene	10.3	1	10		103	70	130			
4-Chlorotoluene	9.86	1	10		99	70	130			
2-Chlorotoluene	9.81	1	10		98	70	130			
1,3,5-Trimethylbenzene	10.4	1	10		104	70	130			
tert-Butylbenzene	10.1	1	10		101	70	130			
1,2,4-Trimethylbenzene	10.6	1	10		106	70	130			
sec-Butylbenzene	10.1	1	10		101	70	130			
1,3-Dichlorobenzene	10.5	1	10		105	70	130			
1,4-Dichlorobenzene	9.65	1	10		97	70	130			
4-Isopropyltoluene	10.5	1	10		105	70	130			
1,2-Dichlorobenzene	9.46	1	10		95	70	130			
n-Butylbenzene	10.8	1	10		108	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	47.1	3	50		94	67	130			
1,2,4-Trichlorobenzene	9.48	2	10		95	70	130			
Naphthalene	8.82	2	10		88	70	130			
Hexachlorobutadiene	21.8	2	20		109	70	130			
1,2,3-Trichlorobenzene	9.59	2	10		96	70	130			



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07-Sep-11

## QC Summary Report

**Work Order:**  
11082403

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Surr: 1,2-Dichloroethane-d4	10.1	10	101	70	130
Surr: Toluene-d8	9.69	10	97	70	130
Surr: 4-Bromofluorobenzene	9.54	10	95	70	130



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Date:  
07-Sep-11

## QC Summary Report

Work Order:  
11082403

### Sample Matrix Spike

File ID: 11082507.D

Type: MS

Test Code: EPA Method SW8260B

Sample ID: 11082403-04AMS

Units: µg/L

Batch ID: MS15W0825M

Analysis Date: 08/25/2011 11:06

Run ID: MSD\_15\_110825B

Prep Date: 08/25/2011 11:06

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	46	2.5	50	0	92	21	138			
Chloromethane	60.5	10	50	0	121	23	144			
Vinyl chloride	60.4	2.5	50	0	121	49	136			
Chloroethane	62.7	2.5	50	0	125	21	159			
Bromomethane	44.6	10	50	0	89	10	174			
Trichlorofluoromethane	60.9	2.5	50	0	122	32	154			
Acetone	699	50	1000	0	70	10	171			
1,1-Dichloroethene	49.9	2.5	50	0	99.8	64	130			
Dichloromethane	49	10	50	0	98	69	130			
Freon-113	55.2	2.5	50	0	110	55	141			
trans-1,2-Dichloroethene	52	2.5	50	0	104	63	130			
Methyl tert-butyl ether (MTBE)	53.5	1.3	50	0	107	47	150			
1,1-Dichloroethane	52.2	2.5	50	0	104	66	130			
2-Butanone (MEK)	921	50	1000	0	92	23	182			
cis-1,2-Dichloroethene	52.8	2.5	50	0	106	70	130			
Bromochloromethane	52.8	2.5	50	0	106	70	132			
Chloroform	53.3	2.5	50	0	107	70	130			
2,2-Dichloropropane	54.6	2.5	50	0	109	38	154			
1,2-Dichloroethane	54.4	2.5	50	0	109	65	134			
1,1,1-Trichloroethane	54.3	2.5	50	0	109	65	136			
1,1-Dichloropropene	55.2	2.5	50	0	110	68	132			
Carbon tetrachloride	53	2.5	50	0	106	58	148			
Benzene	53.5	1.3	50	0	107	59	138			
Dibromomethane	53.4	2.5	50	0	107	70	130			
1,2-Dichloropropane	51.4	2.5	50	0	103	70	131			
Trichloroethene	53.7	2.5	50	1.37	105	65	144			
Bromodichloromethane	52.5	2.5	50	0	105	50	157			
4-Methyl-2-pentanone (MIBK)	138	13	125	0	110	20	182			
cis-1,3-Dichloropropene	50.6	2.5	50	0	101	63	131			
trans-1,3-Dichloropropene	46.9	2.5	50	0	94	65	136			
1,1,2-Trichloroethane	52.7	2.5	50	0	105	70	131			
Toluene	52.7	1.3	50	0	105	68	130			
1,3-Dichloropropane	50.2	2.5	50	0	100	70	130			
2-Hexanone	343	25	500	0	69	20	182			
Dibromochloromethane	44.6	2.5	50	0	89	42	155			
1,2-Dibromoethane (EDB)	102	5	100	0	102	70	130			
Tetrachloroethene	53.4	2.5	50	0	107	65	130			
1,1,1,2-Tetrachloroethane	52.4	2.5	50	0	105	70	130			
Chlorobenzene	51	2.5	50	0	102	70	130			
Ethylbenzene	55.6	1.3	50	0	111	68	130			
m,p-Xylene	54.5	1.3	50	0	109	68	131			
Bromoform	44.4	2.5	50	0	89	65	143			
Styrene	47.6	2.5	50	0	95	59	153			
o-Xylene	54.5	1.3	50	0	109	70	130			
1,1,2,2-Tetrachloroethane	48	2.5	50	0	96	67	130			
1,2,3-Trichloropropane	102	10	100	0	102	70	130			
Isopropylbenzene	51.1	2.5	50	0	102	55	138			
Bromobenzene	51.9	2.5	50	0	104	70	130			
n-Propylbenzene	52.8	2.5	50	0	106	67	133			
4-Chlorotoluene	50.7	2.5	50	0	101	70	130			
2-Chlorotoluene	50.3	2.5	50	0	101	70	130			
1,3,5-Trimethylbenzene	53.9	2.5	50	0	108	67	134			
tert-Butylbenzene	52.5	2.5	50	0	105	55	147			
1,2,4-Trimethylbenzene	54	2.5	50	0	108	65	135			
sec-Butylbenzene	52.1	2.5	50	0	104	68	135			
1,3-Dichlorobenzene	54.4	2.5	50	0	109	70	130			
1,4-Dichlorobenzene	49.9	2.5	50	0	99.9	70	130			
4-Isopropyltoluene	54.2	2.5	50	0	108	68	132			
1,2-Dichlorobenzene	48.7	2.5	50	0	97	70	130			
n-Butylbenzene	56.1	2.5	50	0	112	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	240	15	250	0	96	64	130			
1,2,4-Trichlorobenzene	50.8	10	50	0	102	62	133			
Naphthalene	46.7	10	50	0	93	32	166			
Hexachlorobutadiene	115	10	100	0	115	63	130			
1,2,3-Trichlorobenzene	51.1	10	50	0	102	55	138			



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**Date:**

07-Sep-11

## QC Summary Report

**Work Order:**

11082403

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Surr: 1,2-Dichloroethane-d4	52.2	50	104	70	130
Surr: Toluene-d8	48.3	50	97	70	130
Surr: 4-Bromofluorobenzene	47.6	50	95	70	130



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Date:  
07-Sep-11

## QC Summary Report

Work Order:  
11082403

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11082508.D

Batch ID: MS15W0825M

Analysis Date: 08/25/2011 11:28

Sample ID: 11082403-04AMSD

Units: µg/L

Run ID: MSD\_15\_110825B

Prep Date: 08/25/2011 11:28

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	43	2.5	50	0	86	21	138	45.95	6.6(33)	
Chloromethane	54.1	10	50	0	108	23	144	60.47	11.2(27)	
Vinyl chloride	54.7	2.5	50	0	109	49	136	60.43	10.0(21)	
Chloroethane	54.9	2.5	50	0	110	21	159	62.65	13.2(40)	
Bromomethane	41	10	50	0	82	10	174	44.59	8.5(40)	
Trichlorofluoromethane	54.1	2.5	50	0	108	32	154	60.93	11.9(37)	
Acetone	682	50	1000	0	68	10	171	699.3	2.6(23)	
1,1-Dichloroethene	46.2	2.5	50	0	92	64	130	49.89	7.8(21)	
Dichloromethane	46	10	50	0	92	69	130	49.02	6.4(20)	
Freon-113	51.6	2.5	50	0	103	55	141	55.17	6.7(40)	
trans-1,2-Dichloroethene	48.4	2.5	50	0	97	63	130	52.02	7.3(20)	
Methyl tert-butyl ether (MTBE)	53.4	1.3	50	0	107	47	150	53.45	0.1(40)	
1,1-Dichloroethane	48.7	2.5	50	0	97	66	130	52.15	6.8(20)	
2-Butanone (MEK)	921	50	1000	0	92	23	182	921.3	0.0(22)	
cis-1,2-Dichloroethene	47.7	2.5	50	0	95	70	130	52.81	10.3(20)	
Bromochloromethane	50.4	2.5	50	0	101	70	132	52.81	4.7(20)	
Chloroform	49.7	2.5	50	0	99	70	130	53.28	7.1(20)	
2,2-Dichloropropane	51.2	2.5	50	0	102	38	154	54.61	6.4(22)	
1,2-Dichloroethane	52.4	2.5	50	0	105	65	134	54.38	3.8(20)	
1,1,1-Trichloroethane	50.3	2.5	50	0	101	65	136	54.31	7.8(20)	
1,1-Dichloropropene	51.3	2.5	50	0	103	68	132	55.21	7.3(20)	
Carbon tetrachloride	50	2.5	50	0	100	58	148	52.97	5.8(20)	
Benzene	49.4	1.3	50	0	99	59	138	53.53	8.0(21)	
Dibromomethane	51.5	2.5	50	0	103	70	130	53.35	3.6(20)	
1,2-Dichloropropane	47.9	2.5	50	0	96	70	131	51.35	7.0(20)	
Trichloroethene	49.7	2.5	50	1.37	97	65	144	53.66	7.7(20)	
Bromodichloromethane	49.7	2.5	50	0	99	50	157	52.46	5.4(20)	
4-Methyl-2-pentanone (MIBK)	138	13	125	0	110	20	182	137.8	0.0(20)	
cis-1,3-Dichloropropene	47.9	2.5	50	0	96	63	131	50.55	5.5(20)	
trans-1,3-Dichloropropene	45.5	2.5	50	0	91	65	136	46.92	3.1(20)	
1,1,2-Trichloroethane	50.1	2.5	50	0	100	70	131	52.73	5.1(20)	
Toluene	48.9	1.3	50	0	98	68	130	52.66	7.5(20)	
1,3-Dichloropropane	48.9	2.5	50	0	98	70	130	50.15	2.5(20)	
2-Hexanone	346	25	500	0	69	20	182	342.5	1.0(20)	
Dibromochloromethane	43.7	2.5	50	0	87	42	155	44.64	2.2(20)	
1,2-Dibromoethane (EDB)	99.5	5	100	0	99	70	130	101.7	2.3(20)	
Tetrachloroethene	49.3	2.5	50	0	99	65	130	53.43	8.0(20)	
1,1,1,2-Tetrachloroethane	48.8	2.5	50	0	98	70	130	52.37	7.0(20)	
Chlorobenzene	47.4	2.5	50	0	95	70	130	51.01	7.4(20)	
Ethylbenzene	51.2	1.3	50	0	102	68	130	55.64	8.3(20)	
m,p-Xylene	50.5	1.3	50	0	101	68	131	54.52	7.6(20)	
Bromoform	42.8	2.5	50	0	86	65	143	44.41	3.7(20)	
Styrene	44.4	2.5	50	0	89	59	153	47.56	6.9(37)	
o-Xylene	50.4	1.3	50	0	101	70	130	54.53	7.8(20)	
1,1,2,2-Tetrachloroethane	46.9	2.5	50	0	94	67	130	47.96	2.3(20)	
1,2,3-Trichloropropane	99.5	10	100	0	99.5	70	130	101.8	2.3(20)	
Isopropylbenzene	45.5	2.5	50	0	91	55	138	51.06	11.6(20)	
Bromobenzene	46.9	2.5	50	0	94	70	130	51.88	10.0(20)	
n-Propylbenzene	46.7	2.5	50	0	93	67	133	52.75	12.3(30)	
4-Chlorotoluene	46	2.5	50	0	92	70	130	50.65	9.7(20)	
2-Chlorotoluene	45.1	2.5	50	0	90	70	130	50.25	10.9(20)	
1,3,5-Trimethylbenzene	47.6	2.5	50	0	95	67	134	53.87	12.4(21)	
tert-Butylbenzene	46.5	2.5	50	0	93	55	147	52.53	12.2(20)	
1,2,4-Trimethylbenzene	48	2.5	50	0	96	65	135	53.96	11.8(25)	
sec-Butylbenzene	46.6	2.5	50	0	93	68	135	52.07	11.1(20)	
1,3-Dichlorobenzene	49.2	2.5	50	0	98	70	130	54.36	10.0(20)	
1,4-Dichlorobenzene	45.2	2.5	50	0	90	70	130	49.94	9.9(20)	
4-Isopropyltoluene	48.2	2.5	50	0	96	68	132	54.23	11.7(20)	
1,2-Dichlorobenzene	44.8	2.5	50	0	90	70	130	48.65	8.3(20)	
n-Butylbenzene	50.1	2.5	50	0	100	62	134	56.12	11.3(21)	
1,2-Dibromo-3-chloropropane (DBCP)	244	15	250	0	98	64	130	240	1.6(20)	
1,2,4-Trichlorobenzene	49.1	10	50	0	98	62	133	50.8	3.4(29)	
Naphthalene	49.1	10	50	0	98	32	166	46.72	5.0(40)	
Hexachlorobutadiene	108	10	100	0	108	63	130	115.2	6.1(21)	
1,2,3-Trichlorobenzene	53.5	10	50	0	107	55	138	51.06	4.7(36)	



# Alpha Analytical, Inc.

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

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---

**Date:**

07-Sep-11

## QC Summary Report

**Work Order:**

11082403

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Surr: 1,2-Dichloroethane-d4	54.1	50	108	70	130
Surr: Toluene-d8	48.6	50	97	70	130
Surr: 4-Bromofluorobenzene	46.3	50	93	70	130

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**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

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

**CA**  
**Work-Order : BMIS11082403**  
**Report Due By : 5:00 PM On : 08-Sep-2011**

**Client:** Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215  
 Client's COC # : 024300, 25565  
 QC Level : DSA = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

**Report Attention** Phone Number Email Address  
 David Comer (619) 726-7311 x connard@battelle.org  
 Betsy Cutie (614) 424-4899 x cutiee@battelle.org  
 Shane Walton (614) 424-4117 x waltons@battelle.org

Job : 100006114/JPL Groundwater Monitoring  
 EDD Required : Yes  
 Sampled by : Chase Brogdon, D Loera  
 Cooler Temp Samples Received Date Printed  
 4 °C 24-Aug-2011 24-Aug-2011

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	Requested Tests			Sample Remarks
				300_0_W	314_W	METALS_D W	
BMI11082403-01A	NW-19-5	AQ 08/23/11 09:29	4 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-02A	NW-19-4	AQ 08/23/11 09:58	4 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-03A	NW-19-3	AQ 08/23/11 10:21	4 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-04A	NW-19-2	AQ 08/23/11 10:52	8 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	MS/MSD
BMI11082403-05A	NW-19-1	AQ 08/23/11 11:36	4 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	Logged in sample time per sample containers.
BMI11082403-06A	DUPE-01-3Q11	AQ 08/23/11 00:00	4 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-07A	EB-01-8/23/11	AQ 08/23/11 11:20	5 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-08A	TB-01-8/23/11	AQ 08/23/11 07:00	1 0 10		VOC by 524 Criteria	VOC by 524 Criteria	RENO TRIP BLANK 4/6/11
BMI11082403-09A	SB-01-8/23/11	AQ 08/23/11 11:29	5 0 10	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11082403-10A	NW-7	AQ 08/23/11 10:35	7 0 10	NO <sub>2</sub> , NO <sub>3</sub> , PO <sub>4</sub> , Cl, SO <sub>4</sub> Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria	

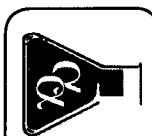
**Comments:** Security seals intact. Frozen ice. Temp Blank #4840 received @ 4°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Per Elizabeth's phone conversation with David Comer, confirmed job number. :

Logged in by: Sara Su Coffee Signature Sara Coffee Print Name Sara Coffee Company Alpha Analytical, Inc. Date/Time 8/24/11 11:36

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:**

Name BATTELLE / GERRARD TEMPKINS  
 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  NV \_\_\_\_\_ WA \_\_\_\_\_  
 ID \_\_\_\_\_ OR \_\_\_\_\_ OTHER \_\_\_\_\_

Page # 1 of 1

25565

Analyses Required

Client Name BATTELLE / DAVID COVNER P.O. # 287215 Job # 6005862  
 Address 3990 OLD TOWN AVE. C205 Email Address CONVERD@BATTELLE.ORG  
 City, State, Zip SAN DIEGO CA 92110 Phone # (619) 726-7311 Fax # (619) 458-6614

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by (CHASE BRADON)	Lab ID Number (Use Only)	Office (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	REMARKS
0929	8/23/11	AQ	CHASE BRADON	BH11082403	-01A	DAVID COVNER	MW - 19 - 5	NONM		4 / VARIOUS	X	X	X	
0958					-02A		MW - 19 - 4			4 / VARIOUS	X	X	X	
1021					-03A		MW - 19 - 3			4 / VARIOUS	X	X	X	
1052					-04A		MW - 19 - 2			8 / VARIOUS	X	X	X	
					-05A		MW - 19 - 1			4 / VARIOUS	X	X	X	
							DUPE			4	X	X	X	DUPLICATE
					-06A		DUPE - 01 - 3011			4 / VARIOUS	X	X	X	DUPLICATE
	1/20	8/23/11			-07A		EB-01-8/23/11			3V 20	X	X	X	REQUIREMENT BLANK
	0900	8/23/11			-08A		TT3-01-8/23/11			1V	X	X	X	TRIP BLANK
	1/29	8/23/11			-09A		SB-01-8/23/11			3V 20	X	X	X	SOURCE BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHASE BRADON	INSIGHT	8/23/11	1530
<i>[Signature]</i>	Anthony Stark	Alpha Analytical	8/23/11	1530
<i>[Signature]</i>	" "	" "	8/23/11	1530
<i>[Signature]</i>	Sara Coffee	" "	8/24/11	11:30

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* - L-Liter V-Vol S-Soil Jar O-Orho 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.







# Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778  
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Date: 08-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11082501

Cooler Temp: 3 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11082501-01A	MW-14-5	Aqueous
11082501-02A	MW-14-4	Aqueous
11082501-03A	MW-14-3	Aqueous
11082501-04A	MW-14-2	Aqueous
11082501-05A	MW-14-1	Aqueous
11082501-06A	DUPE-02-3Q11	Aqueous
11082501-07A	EB-02-08/24/11	Aqueous
11082501-08A	TB-02-8/24/11	Aqueous
11082501-09A	MW-8	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11082501-02A	EPA Method 314.0	Perchlorate
11082501-03A	EPA Method 314.0	Perchlorate
11082501-04A	EPA Method 314.0	Perchlorate
11082501-05A	EPA Method 314.0	Perchlorate
11082501-06A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/25/11

Job: 100006114/JPL Groundwater Monitoring

Anions by IC  
EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-8				
Lab ID: BMI11082501-09A Chloride	6.1	0.50 mg/L	08/25/11 14:18	08/26/11 13:28
Date Sampled 08/24/11 10:45 Nitrite (NO2) - N	ND	0.25 mg/L	08/25/11 14:18	08/25/11 16:10
Nitrate (NO3) - N	0.83	0.25 mg/L	08/25/11 14:18	08/25/11 16:10
Phosphate, ortho - P	ND	0.50 mg/L	08/25/11 14:18	08/25/11 16:10
Sulfate (SO4)	18	0.50 mg/L	08/25/11 14:18	08/25/11 16:10

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  
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9/8/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/25/11

Job: 100006114/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography  
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-14-5</b> Lab ID: BMII1082501-01A Perchlorate Date Sampled 08/24/11 09:14	ND	1.00 µg/L	08/26/11 11:27	08/26/11 22:23
Client ID: <b>MW-14-4</b> Lab ID: BMII1082501-02A Perchlorate Date Sampled 08/24/11 09:39	3.94	1.00 µg/L	08/26/11 11:27	08/26/11 22:41
Client ID: <b>MW-14-3</b> Lab ID: BMII1082501-03A Perchlorate Date Sampled 08/24/11 10:02	4.42	1.00 µg/L	08/26/11 11:27	08/26/11 23:00
Client ID: <b>MW-14-2</b> Lab ID: BMII1082501-04A Perchlorate Date Sampled 08/24/11 10:23	2.47	1.00 µg/L	08/26/11 11:27	08/26/11 23:18
Client ID: <b>MW-14-1</b> Lab ID: BMII1082501-05A Perchlorate Date Sampled 08/24/11 10:54	2.39	1.00 µg/L	08/26/11 11:27	08/26/11 23:36
Client ID: <b>DUPE-02-3Q11</b> Lab ID: BMII1082501-06A Perchlorate Date Sampled 08/24/11 00:00	2.40	1.00 µg/L	08/26/11 11:27	08/26/11 23:55
Client ID: <b>EB-02-08/24/11</b> Lab ID: BMII1082501-07A Perchlorate Date Sampled 08/24/11 10:40	ND	1.00 µg/L	08/26/11 11:27	08/27/11 00:13
Client ID: <b>MW-8</b> Lab ID: BMII1082501-09A Perchlorate Date Sampled 08/24/11 10:45	ND	1.00 µg/L	08/26/11 11:27	08/27/11 00:32

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

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9/8/11

Report Date



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/25/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-14-3</b> Lab ID : BMII1082501-03A Chromium (Cr) Date Sampled 08/24/11 10:02	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:24
Client ID: <b>MW-14-2</b> Lab ID : BMII1082501-04A Chromium (Cr) Date Sampled 08/24/11 10:23	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:01
Client ID: <b>MW-14-1</b> Lab ID : BMII1082501-05A Chromium (Cr) Date Sampled 08/24/11 10:54	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:30
Client ID: <b>DUPE-02-3Q11</b> Lab ID : BMII1082501-06A Chromium (Cr) Date Sampled 08/24/11 00:00	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:36
Client ID: <b>EB-02-08/24/11</b> Lab ID : BMII1082501-07A Chromium (Cr) Date Sampled 08/24/11 10:40	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:42
Client ID: <b>MW-8</b> Lab ID : BMII1082501-09A Chromium (Cr) Date Sampled 08/24/11 10:45	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:48

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

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

Job: 100006114/JPL Groundwater Monitoring

### Tentatively Identified Compounds - Volatile Organics by GC/MS

	Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-14-5</b>					
Lab ID : BMI11082501-01A	*** None Found ***	ND	2.0 µg/L	08/26/11 14:07	08/26/11 14:07
Date Received : 08/25/11					
Date Sampled : 08/24/11 09:14					
Client ID : <b>MW-14-4</b>					
Lab ID : BMI11082501-02A	*** None Found ***	ND	2.0 µg/L	08/26/11 14:28	08/26/11 14:28
Date Received : 08/25/11					
Date Sampled : 08/24/11 09:39					
Client ID : <b>MW-14-3</b>					
Lab ID : BMI11082501-03A	*** None Found ***	ND	2.0 µg/L	08/26/11 14:50	08/26/11 14:50
Date Received : 08/25/11					
Date Sampled : 08/24/11 10:02					
Client ID : <b>MW-14-2</b>					
Lab ID : BMI11082501-04A	*** None Found ***	ND	2.0 µg/L	08/26/11 15:11	08/26/11 15:11
Date Received : 08/25/11					
Date Sampled : 08/24/11 10:23					
Client ID : <b>MW-14-1</b>					
Lab ID : BMI11082501-05A	*** None Found ***	ND	2.0 µg/L	08/26/11 15:33	08/26/11 15:33
Date Received : 08/25/11					
Date Sampled : 08/24/11 10:54					
Client ID : <b>DUPE-02-3Q11</b>					
Lab ID : BMI11082501-06A	*** None Found ***	ND	2.0 µg/L	08/26/11 15:54	08/26/11 15:54
Date Received : 08/25/11					
Date Sampled : 08/24/11 00:00					
Client ID : <b>EB-02-08/24/11</b>					
Lab ID : BMI11082501-07A	*** None Found ***	ND	2.0 µg/L	08/26/11 13:45	08/26/11 13:45
Date Received : 08/25/11					
Date Sampled : 08/24/11 10:40					
Client ID : <b>TB-02-8/24/11</b>					
Lab ID : BMI11082501-08A	*** None Found ***	ND	2.0 µg/L	08/26/11 13:23	08/26/11 13:23
Date Received : 08/25/11					
Date Sampled : 08/24/11 07:20					
Client ID : <b>MW-8</b>					
Lab ID : BMI11082501-09A	*** None Found ***	ND	2.0 µg/L	08/26/11 16:16	08/26/11 16:16
Date Received : 08/25/11					
Date Sampled : 08/24/11 10:45					



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---

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  
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*[Signature]*

9/8/11

**Report Date**

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# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-01A  
Client I.D. Number: MW-14-5

Sampled: 08/24/11 09:14  
Received: 08/25/11  
Extracted: 08/26/11 14:07  
Analyzed: 08/26/11 14:07

### 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-Dichloroethane	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 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.

9/8/11

Report Date





# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-02A  
Client I.D. Number: MW-14-4

Sampled: 08/24/11 09:39  
Received: 08/25/11  
Extracted: 08/26/11 14:28  
Analyzed: 08/26/11 14:28

### 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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  
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*JPG*  
9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-03A  
Client I.D. Number: MW-14-3

Sampled: 08/24/11 10:02  
Received: 08/25/11  
Extracted: 08/26/11 14:50  
Analyzed: 08/26/11 14:50

### Volatiles 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	0.57	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	2.2	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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	0.76	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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.

9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-04A  
Client I.D. Number: MW-14-2

Sampled: 08/24/11 10:23  
Received: 08/25/11  
Extracted: 08/26/11 15:11  
Analyzed: 08/26/11 15:11

### Volatiles 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	0.52	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	5.7	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Schöll, 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

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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-05A  
Client I.D. Number: MW-14-1

Sampled: 08/24/11 10:54  
Received: 08/25/11  
Extracted: 08/26/11 15:33  
Analyzed: 08/26/11 15:33

### 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	1.6	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-06A  
Client I.D. Number: DUPE-02-3Q11

Sampled: 08/24/11 00:00  
Received: 08/25/11  
Extracted: 08/26/11 15:54  
Analyzed: 08/26/11 15:54

### 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-Dichloroethane	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	0.53	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	3.6	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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

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*[Signature]*

9/8/11

Report Date

Page 1 of 1



# 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: 10006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-07A  
Client I.D. Number: EB-02-08/24/11

Sampled: 08/24/11 10:40  
Received: 08/25/11  
Extracted: 08/26/11 13:45  
Analyzed: 08/26/11 13:45

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 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

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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.

9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-08A  
Client I.D. Number: TB-02-8/24/11

Sampled: 08/24/11 07:20  
Received: 08/25/11  
Extracted: 08/26/11 13:23  
Analyzed: 08/26/11 13:23

### 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-Dichloroethane	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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 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

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Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082501-09A  
Client I.D. Number: MW-8

Sampled: 08/24/11 10:45  
Received: 08/25/11  
Extracted: 08/26/11 16:16  
Analyzed: 08/26/11 16:16

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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 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

9/8/11

Report Date

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Page 1 of 1





# Alpha Analytical, Inc.

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

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

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## VOC Sample Preservation Report

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**Work Order:** BMI11082501

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11082501-01A	MW-14-5	Aqueous	2
11082501-02A	MW-14-4	Aqueous	2
11082501-03A	MW-14-3	Aqueous	2
11082501-04A	MW-14-2	Aqueous	2
11082501-05A	MW-14-1	Aqueous	2
11082501-06A	DUPE-02-3Q11	Aqueous	2
11082501-07A	EB-02-08/24/11	Aqueous	2
11082501-08A	TB-02-8/24/11	Aqueous	2
11082501-09A	MW-8	Aqueous	2

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9/8/11

**Report Date**

Page 1 of 1



# Alpha Analytical, Inc.

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

Date:  
30-Aug-11

## QC Summary Report

Work Order:  
11082501

### Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0**

File ID: **20**

Batch ID: **27184**

Analysis Date: **08/25/2011 15:14**

Sample ID: **MB-27184**

Units : **mg/L**

Run ID: **IC\_1\_110825A**

Prep Date: **08/25/2011 14:18**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

### Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0**

File ID: **21**

Batch ID: **27184**

Analysis Date: **08/25/2011 15:33**

Sample ID: **LFB-27184**

Units : **mg/L**

Run ID: **IC\_1\_110825A**

Prep Date: **08/25/2011 14:18**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	49.2	0.5	50		98	90	110			
Nitrite (NO2) - N	5	0.25	5		100	90	110			
Nitrate (NO3) - N	5.25	0.25	5		105	90	110			
Phosphate, ortho - P	5.5	0.5	5		110	90	110			
Sulfate (SO4)	101	0.5	100		101	90	110			

### Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0**

File ID: **24**

Batch ID: **27184**

Analysis Date: **08/25/2011 16:28**

Sample ID: **11082501-09ALFM**

Units : **mg/L**

Run ID: **IC\_1\_110825A**

Prep Date: **08/25/2011 14:18**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	56.2	0.5	50	6.122	100	80	120			
Nitrite (NO2) - N	4.94	0.25	5	0	99	80	120			
Nitrate (NO3) - N	5.86	0.25	5	0.8345	101	80	120			
Phosphate, ortho - P	5.69	0.5	5	0	114	80	120			
Sulfate (SO4)	110	0.5	100	17.87	92	80	120			

### Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0**

File ID: **25**

Batch ID: **27184**

Analysis Date: **08/25/2011 16:47**

Sample ID: **11082501-09ALFMD**

Units : **mg/L**

Run ID: **IC\_1\_110825A**

Prep Date: **08/25/2011 14:18**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	57	0.5	50	6.122	102	80	120	56.24	1.4(15)	
Nitrite (NO2) - N	5.08	0.25	5	0	102	80	120	4.944	2.8(15)	
Nitrate (NO3) - N	5.98	0.25	5	0.8345	103	80	120	5.863	2.0(15)	
Phosphate, ortho - P	6.1	0.5	5	0	122	80	120	5.693	7.0(15)	M1
Sulfate (SO4)	111	0.5	100	17.87	93	80	120	109.7	1.4(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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.





# Alpha Analytical, Inc.

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

Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

### Method Blank

File ID: 082911.B\071_M.D\	Type MBLK	Test Code: EPA Method 200.8	Batch ID: 27185	Analysis Date: 08/29/2011 20:31						
Sample ID: MB-27185	Units : mg/L	Run ID: ICP/MS_110829C	Prep Date: 08/25/2011 15:17							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								

### Laboratory Control Spike

File ID: 082911.B\072_M.D\	Type LCS	Test Code: EPA Method 200.8	Batch ID: 27185	Analysis Date: 08/29/2011 20:37						
Sample ID: LCS-27185	Units : mg/L	Run ID: ICP/MS_110829C	Prep Date: 08/25/2011 15:17							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0507	0.005	0.05		101	85	115			

### Sample Matrix Spike

File ID: 082911.B\128_S8.D\	Type MS	Test Code: EPA Method 200.8	Batch ID: 27185	Analysis Date: 08/30/2011 14:48						
Sample ID: 11082501-04AMS	Units : mg/L	Run ID: ICP/MS_110829C	Prep Date: 08/25/2011 15:17							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0481	0.005	0.05	0	96	70	130			

### Sample Matrix Spike Duplicate

File ID: 082911.B\078_M.D\	Type MSD	Test Code: EPA Method 200.8	Batch ID: 27185	Analysis Date: 08/29/2011 21:12						
Sample ID: 11082501-04AMSD	Units : mg/L	Run ID: ICP/MS_110829C	Prep Date: 08/25/2011 15:17							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0395	0.005	0.05	0	79	70	130	0.0481	19.8(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:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

### Method Blank

File ID: 11082606.D

Type: MBLK Test Code: EPA Method SW8260B

Batch ID: MS15W0826M

Analysis Date: 08/26/2011 11:14

Sample ID: MBLK MS15W0826M

Units: µg/L

Run ID: MSD\_15\_110826B

Prep Date: 08/26/2011 11:14

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	10.5				105	70	130			
Surr: Toluene-d8	9.8				10	98	70	130		



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

Surr: 4-Bromofluorobenzene

9.12

10

91

70

130



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11082604.D

Batch ID: MS15W0826M

Analysis Date: 08/26/2011 10:21

Sample ID: LCS MS15W0826M

Units: µg/L

Run ID: MSD\_15\_110826B

Prep Date: 08/26/2011 10:21

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.15	1	10		92	70	130			
Chloromethane	12.1	2	10		121	70	130			
Vinyl chloride	11	1	10		110	70	130			
Chloroethane	13	1	10		130	70	130			
Bromomethane	9.28	2	10		93	70	130			
Trichlorofluoromethane	12.2	1	10		122	70	130			
1,1-Dichloroethene	10.1	1	10		101	70	130			
Dichloromethane	9.84	2	10		98	70	130			
Freon-113	11.2	1	10		112	70	137			
trans-1,2-Dichloroethene	10.6	1	10		106	70	130			
Methyl tert-butyl ether (MTBE)	10.4	0.5	10		104	70	130			
1,1-Dichloroethane	10.5	1	10		105	70	130			
2-Butanone (MEK)	233	10	200		116	70	130			
cis-1,2-Dichloroethene	10.6	1	10		106	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.8	1	10		108	70	130			
2,2-Dichloropropane	10.9	1	10		109	70	130			
1,2-Dichloroethane	10.8	1	10		108	70	130			
1,1,1-Trichloroethane	11	1	10		110	70	130			
1,1-Dichloropropene	11.3	1	10		113	70	130			
Carbon tetrachloride	10.7	1	10		107	70	130			
Benzene	10.8	0.5	10		108	70	130			
Dibromomethane	10.4	1	10		104	70	130			
1,2-Dichloropropane	10.4	1	10		104	70	130			
Trichloroethene	10.7	1	10		107	70	130			
Bromodichloromethane	10.5	1	10		105	70	130			
4-Methyl-2-pentanone (MIBK)	26.8	2.5	25		107	20	182			
cis-1,3-Dichloropropene	10.3	1	10		103	70	130			
trans-1,3-Dichloropropene	9.41	1	10		94	70	130			
1,1,2-Trichloroethane	10.3	1	10		103	70	130			
Toluene	10.7	0.5	10		107	70	130			
1,3-Dichloropropane	10	1	10		100	70	130			
Dibromochloromethane	8.95	1	10		90	70	130			
1,2-Dibromoethane (EDB)	20.2	2	20		101	70	130			
Tetrachloroethene	10.6	1	10		106	70	130			
1,1,1,2-Tetrachloroethane	10.4	1	10		104	70	130			
Chlorobenzene	10.3	1	10		103	70	130			
Ethylbenzene	11.3	0.5	10		113	70	130			
m,p-Xylene	11.2	0.5	10		112	70	130			
Bromoform	8.67	1	10		87	70	130			
Styrene	9.56	1	10		96	70	130			
o-Xylene	11.1	0.5	10		111	70	130			
1,1,2,2-Tetrachloroethane	9.33	1	10		93	70	130			
1,2,3-Trichloropropane	19.8	2	20		99	70	130			
Isopropylbenzene	10.5	1	10		105	70	130			
Bromobenzene	10.5	1	10		105	70	130			
n-Propylbenzene	10.8	1	10		108	70	130			
4-Chlorotoluene	10.4	1	10		104	70	130			
2-Chlorotoluene	10.3	1	10		103	70	130			
1,3,5-Trimethylbenzene	11	1	10		110	70	130			
tert-Butylbenzene	10.7	1	10		107	70	130			
1,2,4-Trimethylbenzene	11.1	1	10		111	70	130			
sec-Butylbenzene	10.6	1	10		106	70	130			
1,3-Dichlorobenzene	11	1	10		110	70	130			
1,4-Dichlorobenzene	10.1	1	10		101	70	130			
4-Isopropyltoluene	11.1	1	10		111	70	130			
1,2-Dichlorobenzene	9.87	1	10		99	70	130			
n-Butylbenzene	11.4	1	10		114	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	47.4	3	50		95	67	130			
1,2,4-Trichlorobenzene	9.64	2	10		96	70	130			
Naphthalene	8.35	2	10		84	70	130			
Hexachlorobutadiene	22.5	2	20		113	70	130			
1,2,3-Trichlorobenzene	9.26	2	10		93	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:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

Surr: 4-Bromofluorobenzene

9.49

10

95

70

130





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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

### Sample Matrix Spike

Type: MS Test Code: EPA Method SW8260B

File ID: 11082607.D

Batch ID: MS15W0826M

Analysis Date: 08/26/2011 11:36

Sample ID: 11082501-04AMS

Units: µg/L

Run ID: MSD\_15\_110826B

Prep Date: 08/26/2011 11:36

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	41.6	2.5	50	0	83	21	138			
Chloromethane	54.5	10	50	0	109	23	144			
Vinyl chloride	51.4	2.5	50	0	103	49	136			
Chloroethane	53.5	2.5	50	0	107	21	159			
Bromomethane	40.1	10	50	0	80	10	174			
Trichlorofluoromethane	55.2	2.5	50	0	110	32	154			
1,1-Dichloroethene	45.3	2.5	50	0	91	64	130			
Dichloromethane	44.8	10	50	0	90	69	130			
Freon-113	50.8	2.5	50	0	102	55	141			
trans-1,2-Dichloroethene	47.3	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	48.9	1.3	50	0	98	47	150			
1,1-Dichloroethane	47.1	2.5	50	0	94	66	130			
2-Butanone (MEK)	869	50	1000	0	87	23	182			
cis-1,2-Dichloroethene	47.7	2.5	50	0	95	70	130			
Bromochloromethane	48.1	2.5	50	0	96	70	132			
Chloroform	48.8	2.5	50	0.52	96	70	130			
2,2-Dichloropropane	47.8	2.5	50	0	96	38	154			
1,2-Dichloroethane	49.8	2.5	50	0	99.6	65	134			
1,1,1-Trichloroethane	49	2.5	50	0	98	65	136			
1,1-Dichloropropene	50.3	2.5	50	0	101	68	132			
Carbon tetrachloride	47.9	2.5	50	0	96	58	148			
Benzene	48.1	1.3	50	0	96	59	138			
Dibromomethane	48.8	2.5	50	0	98	70	130			
1,2-Dichloropropane	46.1	2.5	50	0	92	70	131			
Trichloroethene	54	2.5	50	5.66	97	65	144			
Bromodichloromethane	47.9	2.5	50	0	96	50	157			
4-Methyl-2-pentanone (MIBK)	127	13	125	0	102	20	182			
cis-1,3-Dichloropropene	45.3	2.5	50	0	91	63	131			
trans-1,3-Dichloropropene	42.7	2.5	50	0	85	65	136			
1,1,2-Trichloroethane	48.8	2.5	50	0	98	70	131			
Toluene	47.5	1.3	50	0	95	68	130			
1,3-Dichloropropane	46.7	2.5	50	0	93	70	130			
Dibromochloromethane	41.4	2.5	50	0	83	42	155			
1,2-Dibromoethane (EDB)	94.5	5	100	0	95	70	130			
Tetrachloroethene	48.5	2.5	50	0	97	65	130			
1,1,1,2-Tetrachloroethane	47.5	2.5	50	0	95	70	130			
Chlorobenzene	46.4	2.5	50	0	93	70	130			
Ethylbenzene	50.6	1.3	50	0	101	68	130			
m,p-Xylene	49.5	1.3	50	0	99	68	131			
Bromoform	41	2.5	50	0	82	65	143			
Styrene	43.1	2.5	50	0	86	59	153			
o-Xylene	49.8	1.3	50	0	99.6	70	130			
1,1,1,2,2-Tetrachloroethane	44.5	2.5	50	0	89	67	130			
1,2,3-Trichloropropane	95	10	100	0	95	70	130			
Isopropylbenzene	46.2	2.5	50	0	92	55	138			
Bromobenzene	47.1	2.5	50	0	94	70	130			
n-Propylbenzene	47.7	2.5	50	0	95	67	133			
4-Chlorotoluene	45.9	2.5	50	0	92	70	130			
2-Chlorotoluene	45.7	2.5	50	0	91	70	130			
1,3,5-Trimethylbenzene	48.7	2.5	50	0	97	67	134			
tert-Butylbenzene	47.4	2.5	50	0	95	55	147			
1,2,4-Trimethylbenzene	48.8	2.5	50	0	98	65	135			
sec-Butylbenzene	47.1	2.5	50	0	94	68	135			
1,3-Dichlorobenzene	49	2.5	50	0	98	70	130			
1,4-Dichlorobenzene	45.4	2.5	50	0	91	70	130			
4-Isopropyltoluene	49.1	2.5	50	0	98	68	132			
1,2-Dichlorobenzene	44.4	2.5	50	0	89	70	130			
n-Butylbenzene	50.6	2.5	50	0	101	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	232	15	250	0	93	64	130			
1,2,4-Trichlorobenzene	45.6	10	50	0	91	62	133			
Naphthalene	42.6	10	50	0	85	32	166			
Hexachlorobutadiene	105	10	100	0	105	63	130			
1,2,3-Trichlorobenzene	48.1	10	50	0	96	55	138			
Surr: 1,2-Dichloroethane-d4	52.8		50		106	70	130			
Surr: Toluene-d8	48.1		50		96	70	130			



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

Surr: 4-Bromofluorobenzene

46.7

50

93

70

130



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082501

Sample Matrix Spike Duplicate  
File ID: 11082608.D

Type: MSD Test Code: EPA Method SW8260B

Batch ID: MS15W0826M

Analysis Date: 08/26/2011 11:57

Sample ID: 11082501-04AMSD

Units: µg/L

Run ID: MSD\_15\_110826B

Prep Date: 08/26/2011 11:57

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	42.4	2.5	50	0	85	21	138	41.6	2.0(33)	
Chloromethane	53.4	10	50	0	107	23	144	54.5	2.1(27)	
Vinyl chloride	52.3	2.5	50	0	105	49	136	51.43	1.6(21)	
Chloroethane	55.5	2.5	50	0	111	21	159	53.47	3.7(40)	
Bromomethane	41.2	10	50	0	82	10	174	40.09	2.7(40)	
Trichlorofluoromethane	56	2.5	50	0	112	32	154	55.19	1.5(37)	
1,1-Dichloroethene	46.4	2.5	50	0	93	64	130	45.28	2.4(21)	
Dichloromethane	46	10	50	0	92	69	130	44.76	2.7(20)	
Freon-113	52.3	2.5	50	0	105	55	141	50.78	2.9(40)	
trans-1,2-Dichloroethene	48.5	2.5	50	0	97	63	130	47.31	2.4(20)	
Methyl tert-butyl ether (MTBE)	52.4	1.3	50	0	105	47	150	48.89	6.9(40)	
1,1-Dichloroethane	48.7	2.5	50	0	97	66	130	47.09	3.4(20)	
2-Butanone (MEK)	930	50	1000	0	93	23	182	869.5	6.7(22)	
cis-1,2-Dichloroethene	49.4	2.5	50	0	99	70	130	47.72	3.5(20)	
Bromochloromethane	50.1	2.5	50	0	100	70	132	48.1	4.1(20)	
Chloroform	50.8	2.5	50	0.52	101	70	130	48.75	4.1(20)	
2,2-Dichloropropane	49.9	2.5	50	0	99.8	38	154	47.81	4.3(22)	
1,2-Dichloroethane	52.1	2.5	50	0	104	65	134	49.78	4.6(20)	
1,1,1-Trichloroethane	50.6	2.5	50	0	101	65	136	49	3.3(20)	
1,1-Dichloropropene	51.4	2.5	50	0	103	68	132	50.25	2.3(20)	
Carbon tetrachloride	49.3	2.5	50	0	99	58	148	47.87	3.0(20)	
Benzene	49.6	1.3	50	0	99	59	138	48.14	3.0(21)	
Dibromomethane	51.3	2.5	50	0	103	70	130	48.8	4.9(20)	
1,2-Dichloropropane	48.3	2.5	50	0	97	70	131	46.1	4.6(20)	
Trichloroethene	55.2	2.5	50	5.66	99	65	144	53.96	2.3(20)	
Bromodichloromethane	50	2.5	50	0	100	50	157	47.85	4.5(20)	
4-Methyl-2-pentanone (MIBK)	135	13	125	0	108	20	182	127.2	6.3(20)	
cis-1,3-Dichloropropene	47.1	2.5	50	0	94	63	131	45.3	3.9(20)	
trans-1,3-Dichloropropene	44.8	2.5	50	0	90	65	136	42.65	4.8(20)	
1,1,2-Trichloroethane	50.9	2.5	50	0	102	70	131	48.79	4.2(20)	
Toluene	48.6	1.3	50	0	97	68	130	47.49	2.4(20)	
1,3-Dichloropropane	48.7	2.5	50	0	97	70	130	46.66	4.3(20)	
Dibromochloromethane	43.3	2.5	50	0	87	42	155	41.44	4.4(20)	
1,2-Dibromoethane (EDB)	98.1	5	100	0	98	70	130	94.53	3.7(20)	
Tetrachloroethene	49.3	2.5	50	0	99	65	130	48.46	1.7(20)	
1,1,1,2-Tetrachloroethane	49	2.5	50	0	98	70	130	47.53	3.1(20)	
Chlorobenzene	47.5	2.5	50	0	95	70	130	46.38	2.3(20)	
Ethylbenzene	51.5	1.3	50	0	103	68	130	50.58	1.7(20)	
m,p-Xylene	50.2	1.3	50	0	100	68	131	49.53	1.2(20)	
Bromoform	43.1	2.5	50	0	86	65	143	41.03	4.9(20)	
Styrene	44.1	2.5	50	0	88	59	153	43.12	2.1(37)	
o-Xylene	50.6	1.3	50	0	101	70	130	49.79	1.6(20)	
1,1,2,2-Tetrachloroethane	47.1	2.5	50	0	94	67	130	44.53	5.7(20)	
1,2,3-Trichloropropane	100	10	100	0	100	70	130	94.98	5.4(20)	
Isopropylbenzene	46.6	2.5	50	0	93	55	138	46.15	0.9(20)	
Bromobenzene	48.2	2.5	50	0	96	70	130	47.05	2.5(20)	
n-Propylbenzene	47.9	2.5	50	0	96	67	133	47.74	0.3(30)	
4-Chlorotoluene	46.7	2.5	50	0	93	70	130	45.91	1.6(20)	
2-Chlorotoluene	45.8	2.5	50	0	92	70	130	45.71	0.1(20)	
1,3,5-Trimethylbenzene	49.2	2.5	50	0	98	67	134	48.67	1.2(21)	
tert-Butylbenzene	48	2.5	50	0	96	55	147	47.44	1.2(20)	
1,2,4-Trimethylbenzene	49.1	2.5	50	0	98	65	135	48.78	0.6(25)	
sec-Butylbenzene	47.7	2.5	50	0	95	68	135	47.14	1.1(20)	
1,3-Dichlorobenzene	49.9	2.5	50	0	99.8	70	130	49.03	1.8(20)	
1,4-Dichlorobenzene	46.2	2.5	50	0	92	70	130	45.38	1.8(20)	
4-Isopropyltoluene	49.7	2.5	50	0	99	68	132	49.14	1.1(20)	
1,2-Dichlorobenzene	46.1	2.5	50	0	92	70	130	44.43	3.6(20)	
n-Butylbenzene	51.1	2.5	50	0	102	62	134	50.63	0.9(21)	
1,2-Dibromo-3-chloropropane (DBCP)	249	15	250	0	99	64	130	232	6.9(20)	
1,2,4-Trichlorobenzene	49	10	50	0	98	62	133	45.62	7.1(29)	
Naphthalene	47.6	10	50	0	95	32	166	42.57	11.2(40)	
Hexachlorobutadiene	111	10	100	0	111	63	130	105	5.5(21)	
1,2,3-Trichlorobenzene	52.5	10	50	0	105	55	138	48.08	8.9(36)	
Surr: 1,2-Dichloroethane-d4	54.6		50		109	70	130			
Surr: Toluene-d8	48.1		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:**

08-Sep-11

## QC Summary Report

**Work Order:**

11082501

---

Surr: 4-Bromofluorobenzene

46.5

50

93

70

130

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**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

## Alpha Analytical, Inc.

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

# CA

WorkOrder : BMIS11082501

Report Due By : 5:00 PM On : 09-Sep-2011

Client:

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

Report Attention

David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@battelle.org
Shane Walton	(614) 424-4117 x	walton@s@battelle.org

Phone Number      Email Address

PO : 287215

EDD Required : Yes

Sampled by : Chase Brogdon, D. Loera

Cooler Temp

Samples Received

Date Printed

3 °C

25-Aug-2011

25-Aug-2011

Client's COC # : 24134, 024301

Job : 100006114/JPL Groundwater Monitoring

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

Alpha Sample ID	Client Sample ID	Collection Date	No. of Bottles Alpha Sub	TAT	Requested Tests			Sample Remarks	
					300_0_W	314_W	METALS_D W		
BM11082501-01A	MW-14-5	08/24/11 09:14	4	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	
BM11082501-02A	MW-14-4	08/24/11 09:39	4	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	
BM11082501-03A	MW-14-3	08/24/11 10:02	5	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	
BM11082501-04A	MW-14-2	08/24/11 10:23	5	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	Level IV QC
BM11082501-05A	MW-14-1	08/24/11 10:54	5	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	
BM11082501-06A	DUPE-02-3Q11	08/24/11 00:00	5	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	
BM11082501-07A	EB-02-08/24/11	08/24/11 10:40	5	0	10	Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	Sample time taken from sample containers.
BM11082501-08A	TB-02-8/24/11	08/24/11 07:20	1	0	10		VOC by 524 Criteria	VOC_ W Criteria	Reno Trip Blank 4/6/11
BM11082501-09A	MW-8	08/24/11 10:45	7	0	10	NO <sub>2</sub> , NO <sub>3</sub> , SO <sub>4</sub> , Cl, PO <sub>4</sub> Perchlorate	VOC by 524 Criteria	VOC_ W Criteria	

Comments: No security seals. Frozen ice. Temp Blank #8485 received @ 3°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD):

Signature

*Elizabeth Adcox*

Print Name

Elizabeth Adcox

Company

Alpha Analytical, Inc.

Date/Time

8:25:11 8/25/11

Logged in by:

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







# Alpha Analytical, Inc.

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

Date: 08-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11082601

Cooler Temp: 0°C

Alpha's Sample ID	Client's Sample ID	Matrix
11082601-01A	MW-17-4	Aqueous
11082601-02A	MW-17-3	Aqueous
11082601-03A	MW-17-2	Aqueous
11082601-04A	EB-03-8/25/11	Aqueous
11082601-05A	TB-03-8/25/11	Aqueous
11082601-06A	MW-18-5	Aqueous
11082601-07A	MW-18-4	Aqueous
11082601-08A	MW-18-3	Aqueous
11082601-09A	MW-18-2	Aqueous
11082601-10A	DUPE-03-3Q11	Aqueous
11082601-11A	MW-13	Aqueous
11082601-12A	MW-5	Aqueous
11082601-13A	MW-10	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11082601-01A	EPA Method 314.0	Perchlorate
11082601-02A	EPA Method 314.0	Perchlorate
11082601-03A	EPA Method 314.0	Perchlorate
11082601-07A	EPA Method 314.0	Perchlorate
11082601-08A	EPA Method 314.0	Perchlorate
11082601-11A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.





# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/26/11

Job: 100006114/JPL Groundwater Monitoring

Anions by IC  
EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-13				
Lab ID: BMI11082601-11A Chloride	30	0.50 mg/L	08/26/11 12:23	08/26/11 13:10
Date Sampled 08/25/11 08:43 Nitrite (NO2) - N	ND	0.25 mg/L	08/26/11 12:23	08/26/11 13:10
Nitrate (NO3) - N	7.3	0.25 mg/L	08/26/11 12:23	08/26/11 13:10
Phosphate, ortho - P	ND	0.50 mg/L	08/26/11 12:23	08/26/11 13:10
Sulfate (SO4)	57	0.50 mg/L	08/26/11 12:23	08/26/11 13:10

ND = Not Detected

*Roger Scholl*      *Randy Gardner*      *Walter Hinchman*

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9/8/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/26/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-17-4</b>				
Lab ID: BMI11082601-01A Perchlorate	1.12	1.00 µg/L	08/26/11 11:27	08/26/11 20:14
Date Sampled 08/25/11 08:51				
Client ID: <b>MW-17-3</b>				
Lab ID: BMI11082601-02A Perchlorate	6.62	1.00 µg/L	08/26/11 11:27	08/26/11 13:56
Date Sampled 08/25/11 09:23				
Client ID: <b>MW-17-2</b>				
Lab ID: BMI11082601-03A Perchlorate	78.7	5.00 µg/L	08/26/11 11:27	08/26/11 19:37
Date Sampled 08/25/11 09:53				
Client ID: <b>EB-03-8/25/11</b>				
Lab ID: BMI11082601-04A Perchlorate	ND	1.00 µg/L	08/26/11 11:27	08/26/11 15:09
Date Sampled 08/25/11 09:42				
Client ID: <b>MW-18-5</b>				
Lab ID: BMI11082601-06A Perchlorate	ND	1.00 µg/L	08/26/11 11:27	08/26/11 20:32
Date Sampled 08/25/11 11:13				
Client ID: <b>MW-18-4</b>				
Lab ID: BMI11082601-07A Perchlorate	10.9	1.00 µg/L	08/26/11 11:27	08/26/11 15:46
Date Sampled 08/25/11 11:44				
Client ID: <b>MW-18-3</b>				
Lab ID: BMI11082601-08A Perchlorate	144	10.0 µg/L	08/26/11 11:27	08/29/11 19:55
Date Sampled 08/25/11 12:13				
Client ID: <b>MW-18-2</b>				
Lab ID: BMI11082601-09A Perchlorate	ND	1.00 µg/L	08/26/11 11:27	08/26/11 16:23
Date Sampled 08/25/11 12:51				
Client ID: <b>DUPE-03-3Q11</b>				
Lab ID: BMI11082601-10A Perchlorate	ND	1.00 µg/L	08/26/11 11:27	08/26/11 20:51
Date Sampled 08/25/11 00:00				
Client ID: <b>MW-13</b>				
Lab ID: BMI11082601-11A Perchlorate	253	10.0 µg/L	08/26/11 11:27	08/29/11 14:10
Date Sampled 08/25/11 08:43				
Client ID: <b>MW-5</b>				
Lab ID: BMI11082601-12A Perchlorate	ND	1.00 µg/L	08/26/11 11:27	08/26/11 21:46
Date Sampled 08/25/11 11:00				



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Client ID: MW-10

Lab ID: BM111082601-13A Perchlorate

ND

1.00 µg/L

08/26/11 11:27 08/26/11 22:04

Date Sampled 08/25/11 13:57

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.

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*e*  
9/8/11

---

Report Date



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/26/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-17-4				
Lab ID : BM111082601-01A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:16
Date Sampled 08/25/11 08:51				
Client ID: MW-17-3				
Lab ID : BM111082601-02A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/29/11 23:53
Date Sampled 08/25/11 09:23				
Client ID: MW-17-2				
Lab ID : BM111082601-03A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:22
Date Sampled 08/25/11 09:53				
Client ID: EB-03-8/25/11				
Lab ID : BM111082601-04A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:28
Date Sampled 08/25/11 09:42				
Client ID: MW-18-4				
Lab ID : BM111082601-07A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:34
Date Sampled 08/25/11 11:44				
Client ID: MW-18-3				
Lab ID : BM111082601-08A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:40
Date Sampled 08/25/11 12:13				
Client ID: MW-18-2				
Lab ID : BM111082601-09A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:46
Date Sampled 08/25/11 12:51				
Client ID: DUPE-03-3Q11				
Lab ID : BM111082601-10A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:52
Date Sampled 08/25/11 00:00				
Client ID: MW-13				
Lab ID : BM111082601-11A Chromium (Cr)	0.0060	0.0050 mg/L	08/29/11 17:10	08/30/11 00:58
Date Sampled 08/25/11 08:43				
Client ID: MW-5				
Lab ID : BM111082601-12A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 09:42
Date Sampled 08/25/11 11:00				
Client ID: MW-10				
Lab ID : BM111082601-13A Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 09:48
Date Sampled 08/25/11 13:57				



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---

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  
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*a*  
9/8/11

**Report Date**



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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-17-4</b> Lab ID : BMI11082601-01A Date Received : 08/26/11 Date Sampled : 08/25/11 08:51	*** None Found ***	ND	08/29/11 17:10	09/01/11 13:11
Client ID : <b>MW-17-3</b> Lab ID : BMI11082601-02A Date Received : 08/26/11 Date Sampled : 08/25/11 09:23	*** None Found ***	ND	09/01/11 13:32	09/01/11 13:32
Client ID : <b>MW-17-2</b> Lab ID : BMI11082601-03A Date Received : 08/26/11 Date Sampled : 08/25/11 09:53	*** None Found ***	ND	09/01/11 13:54	09/01/11 13:54
Client ID : <b>EB-03-8/25/11</b> Lab ID : BMI11082601-04A Date Received : 08/26/11 Date Sampled : 08/25/11 09:42	*** None Found ***	ND	09/01/11 12:27	09/01/11 12:27
Client ID : <b>TB-03-8/25/11</b> Lab ID : BMI11082601-05A Date Received : 08/26/11 Date Sampled : 08/25/11 07:30	*** None Found ***	ND	09/01/11 12:49	09/01/11 12:49
Client ID : <b>MW-18-5</b> Lab ID : BMI11082601-06A Date Received : 08/26/11 Date Sampled : 08/25/11 11:13	*** None Found ***	ND	09/01/11 14:15	09/01/11 14:15
Client ID : <b>MW-18-4</b> Lab ID : BMI11082601-07A Date Received : 08/26/11 Date Sampled : 08/25/11 11:44	*** None Found ***	ND	09/01/11 14:37	09/01/11 14:37
Client ID : <b>MW-18-3</b> Lab ID : BMI11082601-08A Date Received : 08/26/11 Date Sampled : 08/25/11 12:13	*** None Found ***	ND	09/01/11 14:59	09/01/11 14:59
Client ID : <b>MW-18-2</b> Lab ID : BMI11082601-09A Date Received : 08/26/11 Date Sampled : 08/25/11 12:51	*** None Found ***	ND	09/01/11 15:20	09/01/11 15:20



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Client ID :	<b>DUPE-03-3Q11</b>					
Lab ID :	BMI11082601-10A	*** None Found ***	ND	2.0 µg/L	09/01/11 15:41	09/01/11 15:41
Date Received :	08/26/11					
Date Sampled :	08/25/11 00:00					
Client ID :	<b>MW-13</b>					
Lab ID :	BMI11082601-11A	*** None Found ***	ND	2.0 µg/L	09/01/11 16:03	09/01/11 16:03
Date Received :	08/26/11					
Date Sampled :	08/25/11 08:43					
Client ID :	<b>MW-5</b>					
Lab ID :	BMI11082601-12A	*** None Found ***	ND	2.0 µg/L	09/01/11 16:25	09/01/11 16:25
Date Received :	08/26/11					
Date Sampled :	08/25/11 11:00					
Client ID :	<b>MW-10</b>					
Lab ID :	BMI11082601-13A	*** None Found ***	ND	2.0 µg/L	09/01/11 16:46	09/01/11 16:46
Date Received :	08/26/11					
Date Sampled :	08/25/11 13:57					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

**Report Date**

Page 1 of 1



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-01A  
Client I.D. Number: MW-17-4

Sampled: 08/25/11 08:51  
Received: 08/26/11  
Extracted: 09/01/11 13:11  
Analyzed: 09/01/11 13:11

### 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	1.2	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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 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

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9/8/11

Report Date





# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-02A  
Client I.D. Number: MW-17-3

Sampled: 08/25/11 09:23  
Received: 08/26/11  
Extracted: 09/01/11 13:32  
Analyzed: 09/01/11 13:32

### 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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-03A  
Client I.D. Number: MW-17-2

Sampled: 08/25/11 09:53  
Received: 08/26/11  
Extracted: 09/01/11 13:54  
Analyzed: 09/01/11 13:54

### 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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 Trichloroethane	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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Report Date

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-04A  
Client I.D. Number: EB-03-8/25/11

Sampled: 08/25/11 09:42  
Received: 08/26/11  
Extracted: 09/01/11 12:27  
Analyzed: 09/01/11 12:27

### 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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

Report Date



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-05A  
Client I.D. Number: TB-03-8/25/11

Sampled: 08/25/11 07:30  
Received: 08/26/11  
Extracted: 09/01/11 12:49  
Analyzed: 09/01/11 12:49

### 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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-06A  
Client I.D. Number: MW-18-5

Sampled: 08/25/11 11:13  
Received: 08/26/11  
Extracted: 09/01/11 14:15  
Analyzed: 09/01/11 14:15

### 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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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.

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*[Signature]*  
9/8/11

Report Date

Page 1 of 1



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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-07A  
Client I.D. Number: MW-18-4

Sampled: 08/25/11 11:44  
Received: 08/26/11  
Extracted: 09/01/11 14:37  
Analyzed: 09/01/11 14:37

### 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	0.72	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	1.9	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	0.77	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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	0.75	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-08A  
Client I.D. Number: MW-18-3

Sampled: 08/25/11 12:13  
Received: 08/26/11  
Extracted: 09/01/11 14:59  
Analyzed: 09/01/11 14:59

### 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	0.93	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	4.7	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	43	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	3.6	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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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 L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  
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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-09A  
Client I.D. Number: MW-18-2

Sampled: 08/25/11 12:51  
Received: 08/26/11  
Extracted: 09/01/11 15:20  
Analyzed: 09/01/11 15:20

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-10A  
Client I.D. Number: DUPE-03-3Q11

Sampled: 08/25/11 00:00  
Received: 08/26/11  
Extracted: 09/01/11 15:41  
Analyzed: 09/01/11 15:41

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 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

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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-11A  
Client I.D. Number: MW-13

Sampled: 08/25/11 08:43  
Received: 08/26/11  
Extracted: 09/01/11 16:03  
Analyzed: 09/01/11 16:03

### 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	2.3	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	0.75	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	0.96	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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

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9/8/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-12A  
Client I.D. Number: MW-5

Sampled: 08/25/11 11:00  
Received: 08/26/11  
Extracted: 09/01/11 16:25  
Analyzed: 09/01/11 16:25

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/8/11

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11082601-13A  
Client I.D. Number: MW-10

Sampled: 08/25/11 13:57  
Received: 08/26/11  
Extracted: 09/01/11 16:46  
Analyzed: 09/01/11 16:46

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	97	(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

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Report Date

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# Alpha Analytical, Inc.

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

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

## VOC Sample Preservation Report

Work Order: BMI11082601

Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11082601-01A	MW-17-4	Aqueous	2
11082601-02A	MW-17-3	Aqueous	2
11082601-03A	MW-17-2	Aqueous	2
11082601-04A	EB-03-8/25/11	Aqueous	2
11082601-05A	TB-03-8/25/11	Aqueous	2
11082601-06A	MW-18-5	Aqueous	2
11082601-07A	MW-18-4	Aqueous	2
11082601-08A	MW-18-3	Aqueous	2
11082601-09A	MW-18-2	Aqueous	2
11082601-10A	DUPE-03-3Q11	Aqueous	2
11082601-11A	MW-13	Aqueous	2
11082601-12A	MW-5	Aqueous	2
11082601-13A	MW-10	Aqueous	2

9/8/11

Report Date

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# Alpha Analytical, Inc.

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

Date:  
30-Aug-11

## QC Summary Report

Work Order:  
11082601

### Method Blank

Method Blank		Type: <b>MBLK</b>	Test Code: <b>EPA Method 300.0</b>							
File ID: <b>20</b>			Batch ID: <b>27197</b>				Analysis Date: <b>08/26/2011 12:14</b>			
Sample ID: <b>MB-27197</b>	Units : <b>mg/L</b>		Run ID: <b>IC_1_110826A</b>				Prep Date: <b>08/26/2011 12:23</b>			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

### Laboratory Fortified Blank

Laboratory Fortified Blank		Type: <b>LFB</b>	Test Code: <b>EPA Method 300.0</b>							
File ID: <b>21</b>			Batch ID: <b>27197</b>				Analysis Date: <b>08/26/2011 12:33</b>			
Sample ID: <b>LFB-27197</b>	Units : <b>mg/L</b>		Run ID: <b>IC_1_110826A</b>				Prep Date: <b>08/26/2011 12:23</b>			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	49.1	0.5	50		98	90	110			
Nitrite (NO2) - N	4.91	0.25	5		98	90	110			
Nitrate (NO3) - N	5.24	0.25	5		105	90	110			
Phosphate, ortho - P	5.39	0.5	5		108	90	110			
Sulfate (SO4)	101	0.5	100		101	90	110			

### Sample Matrix Spike

Sample Matrix Spike		Type: <b>LFM</b>	Test Code: <b>EPA Method 300.0</b>							
File ID: <b>25</b>			Batch ID: <b>27197</b>				Analysis Date: <b>08/26/2011 13:47</b>			
Sample ID: <b>11082601-11ALFM</b>	Units : <b>mg/L</b>		Run ID: <b>IC_1_110826A</b>				Prep Date: <b>08/26/2011 12:23</b>			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	131	0.5	100	29.73	102	80	120			
Nitrite (NO2) - N	10	0.25	10	0	100	80	120			
Nitrate (NO3) - N	18.3	0.25	10	7.289	110	80	120			
Phosphate, ortho - P	11.6	0.5	10	0	116	80	120			
Sulfate (SO4)	248	0.5	200	57.35	95	80	120			

### Sample Matrix Spike Duplicate

Sample Matrix Spike Duplicate		Type: <b>LFMD</b>	Test Code: <b>EPA Method 300.0</b>							
File ID: <b>26</b>			Batch ID: <b>27197</b>				Analysis Date: <b>08/26/2011 14:06</b>			
Sample ID: <b>11082601-11ALFMD</b>	Units : <b>mg/L</b>		Run ID: <b>IC_1_110826A</b>				Prep Date: <b>08/26/2011 12:23</b>			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	131	0.5	100	29.73	101	80	120	131.3	0.2(15)	
Nitrite (NO2) - N	10.3	0.25	10	0	103	80	120	10	2.5(15)	
Nitrate (NO3) - N	18.3	0.25	10	7.289	110	80	120	18.29	0.1(15)	
Phosphate, ortho - P	12.1	0.5	10	0	121	80	120	11.59	4.0(15)	M1
Sulfate (SO4)	247	0.5	200	57.35	95	80	120	248.1	0.6(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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.



# Alpha Analytical, Inc.

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

Date:  
06-Sep-11

## QC Summary Report

Work Order:  
11082601

### Method Blank

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

File ID: 14											Batch ID: 27194	Analysis Date: 08/26/2011 12:24
Sample ID: MB-27194	Units : µg/L										Run ID: IC_3_110826B	Prep Date: 08/26/2011 11:27
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: 15											Batch ID: 27194	Analysis Date: 08/26/2011 12:42
Sample ID: LFB-27194	Units : µg/L										Run ID: IC_3_110826B	Prep Date: 08/26/2011 11:27
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual		
Perchlorate	23.5	2	25		94	85	115					

### Sample Matrix Spike

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

File ID: 20											Batch ID: 27194	Analysis Date: 08/26/2011 14:14
Sample ID: 11082601-02ALFM	Units : µg/L										Run ID: IC_3_110826B	Prep Date: 08/26/2011 11:27
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual		
Perchlorate	31.4	2	25	6.62	99	80	120					

### Sample Matrix Spike Duplicate

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

File ID: 21											Batch ID: 27194	Analysis Date: 08/26/2011 14:33
Sample ID: 11082601-02ALFMD	Units : µg/L										Run ID: IC_3_110826B	Prep Date: 08/26/2011 11:27
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual		
Perchlorate	29.9	2	25	6.62	93	80	120	31.4	4.8(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:  
02-Sep-11

## QC Summary Report

Work Order:  
11082601

### Method Blank

File ID: 082911.B\098\_M.D\

Sample ID: MB-27211

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

Type: MBLK Test Code: EPA Method 200.8

Batch ID: 27211

Analysis Date: 08/29/2011 23:23

Run ID: ICP/MS\_110829D

Prep Date: 08/29/2011 17:10

### Laboratory Control Spike

File ID: 082911.B\099\_M.D\

Sample ID: LCS-27211

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0495	0.005	0.05		99	85	115			

Type: LCS Test Code: EPA Method 200.8

Batch ID: 27211

Analysis Date: 08/29/2011 23:29

Run ID: ICP/MS\_110829D

Prep Date: 08/29/2011 17:10

### Sample Matrix Spike

File ID: 082911.B\104\_M.D\

Sample ID: 11082601-02AMS

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0452	0.005	0.05		0	90	70	130		

Type: MS Test Code: EPA Method 200.8

Batch ID: 27211

Analysis Date: 08/29/2011 23:59

Run ID: ICP/MS\_110829D

Prep Date: 08/29/2011 17:10

### Sample Matrix Spike Duplicate

File ID: 082911.B\105\_M.D\

Sample ID: 11082601-02AMSD

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0481	0.005	0.05		0	96	70	130	0.04515	6.4(20)

Type: MSD Test Code: EPA Method 200.8

Batch ID: 27211

Analysis Date: 08/30/2011 00:05

Run ID: ICP/MS\_110829D

Prep Date: 08/29/2011 17:10

### 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:  
08-Sep-11

## QC Summary Report

Work Order:  
11082601

### Method Blank

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

File ID: **11090107.D**

Batch ID: **MS15W0901M**

Analysis Date: **09/01/2011 10:18**

Sample ID: **MBLK MS15W0901M**

Units: **µg/L**

Run ID: **MSD\_15\_110901B**

Prep Date: **09/01/2011 10:18**

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	10.7		10		107	70	130			
Surr: Toluene-d8	9.87		10		99	70	130			



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**Date:**

*08-Sep-11*

## QC Summary Report

**Work Order:**

11082601

Surr: 4-Bromofluorobenzene

9.12

10

91

70

130



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082601

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11090104.D

Batch ID: MS15W0901M

Analysis Date: 09/01/2011 09:06

Sample ID: LCS MS15W0901M

Units: µg/L

Run ID: MSD\_15\_110901B

Prep Date: 09/01/2011 09:06

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	7.8	1	10		78	70	130			
Chloromethane	10.2	2	10		102	70	130			
Vinyl chloride	10.6	1	10		106	70	130			
Chloroethane	12.4	1	10		124	70	130			
Bromomethane	7.06	2	10		71	70	130			
Trichlorofluoromethane	12.1	1	10		121	70	130			
1,1-Dichloroethene	9.47	1	10		95	70	130			
Dichloromethane	9.44	2	10		94	70	130			
Freon-113	10.2	1	10		102	70	137			
trans-1,2-Dichloroethene	9.87	1	10		99	70	130			
Methyl tert-butyl ether (MTBE)	10.7	0.5	10		107	70	130			
1,1-Dichloroethane	9.92	1	10		99	70	130			
2-Butanone (MEK)	274	10	200		137	70	130(130)			L51
cis-1,2-Dichloroethene	9.99	1	10		99.9	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.2	1	10		102	70	130			
2,2-Dichloropropane	10.2	1	10		102	70	130			
1,2-Dichloroethane	10.9	1	10		109	70	130			
1,1,1-Trichloroethane	10.4	1	10		104	70	130			
1,1-Dichloropropene	10.5	1	10		105	70	130			
Carbon tetrachloride	10	1	10		100	70	130			
Benzene	10.1	0.5	10		101	70	130			
Dibromomethane	10.6	1	10		106	70	130			
1,2-Dichloropropane	9.86	1	10		99	70	130			
Trichloroethene	9.94	1	10		99	70	130			
Bromodichloromethane	10.3	1	10		103	70	130			
4-Methyl-2-pentanone (MIBK)	30.5	2.5	25		122	20	182			
cis-1,3-Dichloropropene	10	1	10		100	70	130			
trans-1,3-Dichloropropene	9.45	1	10		95	70	130			
1,1,2-Trichloroethane	10.4	1	10		104	70	130			
Toluene	9.94	0.5	10		99	70	130			
1,3-Dichloropropane	9.97	1	10		99.7	70	130			
Dibromochloromethane	8.98	1	10		90	70	130			
1,2-Dibromoethane (EDB)	20.4	2	20		102	70	130			
Tetrachloroethene	9.87	1	10		99	70	130			
1,1,1,2-Tetrachloroethane	10.1	1	10		101	70	130			
Chlorobenzene	9.64	1	10		96	70	130			
Ethylbenzene	10.5	0.5	10		105	70	130			
m,p-Xylene	10.3	0.5	10		103	70	130			
Bromoform	9	1	10		90	70	130			
Styrene	8.93	1	10		89	70	130			
o-Xylene	10.3	0.5	10		103	70	130			
1,1,2,2-Tetrachloroethane	9.46	1	10		95	70	130			
1,2,3-Trichloropropane	20.5	2	20		102	70	130			
Isopropylbenzene	9.3	1	10		93	70	130			
Bromobenzene	9.71	1	10		97	70	130			
n-Propylbenzene	9.5	1	10		95	70	130			
4-Chlorotoluene	9.32	1	10		93	70	130			
2-Chlorotoluene	9.14	1	10		91	70	130			
1,3,5-Trimethylbenzene	9.8	1	10		98	70	130			
tert-Butylbenzene	9.5	1	10		95	70	130			
1,2,4-Trimethylbenzene	9.89	1	10		99	70	130			
sec-Butylbenzene	9.34	1	10		93	70	130			
1,3-Dichlorobenzene	10	1	10		100	70	130			
1,4-Dichlorobenzene	9.19	1	10		92	70	130			
4-Isopropyltoluene	9.79	1	10		98	70	130			
1,2-Dichlorobenzene	9.21	1	10		92	70	130			
n-Butylbenzene	10.1	1	10		101	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	49.9	3	50		99.9	67	130			
1,2,4-Trichlorobenzene	9.45	2	10		95	70	130			
Naphthalene	8.84	2	10		88	70	130			
Hexachlorobutadiene	20.9	2	20		104	70	130			
1,2,3-Trichlorobenzene	9.78	2	10		98	70	130			
Surr: 1,2-Dichloroethane-d4	11		10		110	70	130			
Surr: Toluene-d8	9.64		10		96	70	130			



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**Date:**

08-Sep-11

## QC Summary Report

**Work Order:**

11082601

Surr: 4-Bromofluorobenzene

9.16

10

92

70

130



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Date:  
08-Sep-11

## QC Summary Report

Work Order:  
11082601

### Sample Matrix Spike

Type: MS Test Code: EPA Method SW8260B

File ID: 11090108.D

Batch ID: MS15W0901M

Analysis Date: 09/01/2011 10:40

Sample ID: 11082601-02AMS

Units: µg/L

Run ID: MSD\_15\_110901B

Prep Date: 09/01/2011 10:40

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	37.9	2.5	50	0	76	21	138			
Chloromethane	50.6	10	50	0	101	23	144			
Vinyl chloride	55.7	2.5	50	0	111	49	136			
Chloroethane	59.4	2.5	50	0	119	21	159			
Bromomethane	39.5	10	50	0	79	10	174			
Trichlorofluoromethane	61.1	2.5	50	0	122	32	154			
1,1-Dichloroethene	45.8	2.5	50	0	92	64	130			
Dichloromethane	45.3	10	50	0	91	69	130			
Freon-113	51.8	2.5	50	0	104	55	141			
trans-1,2-Dichloroethene	47.4	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	48.4	1.3	50	0	97	47	150			
1,1-Dichloroethane	48.1	2.5	50	0	96	66	130			
2-Butanone (MEK)	868	50	1000	0	87	23	182			
cis-1,2-Dichloroethene	48.5	2.5	50	0	97	70	130			
Bromochloromethane	49.4	2.5	50	0	99	70	132			
Chloroform	50.5	2.5	50	0	101	70	130			
2,2-Dichloropropane	49	2.5	50	0	98	38	154			
1,2-Dichloroethane	51.5	2.5	50	0	103	65	134			
1,1,1-Trichloroethane	51.1	2.5	50	0	102	65	136			
1,1-Dichloropropene	51.8	2.5	50	0	104	68	132			
Carbon tetrachloride	50	2.5	50	0	100	58	148			
Benzene	49.6	1.3	50	0	99	59	138			
Dibromomethane	49.7	2.5	50	0	99	70	130			
1,2-Dichloropropane	47.4	2.5	50	0	95	70	131			
Trichloroethene	48.5	2.5	50	0	97	65	144			
Bromodichloromethane	49.1	2.5	50	0	98	50	157			
4-Methyl-2-pentanone (MIBK)	127	13	125	0	101	20	182			
cis-1,3-Dichloropropene	45.5	2.5	50	0	91	63	131			
trans-1,3-Dichloropropene	43	2.5	50	0	86	65	136			
1,1,2-Trichloroethane	49.1	2.5	50	0	98	70	131			
Toluene	47.7	1.3	50	0	95	68	130			
1,3-Dichloropropane	45.6	2.5	50	0	91	70	130			
Dibromochloromethane	40.9	2.5	50	0	82	42	155			
1,2-Dibromoethane (EDB)	92.4	5	100	0	92	70	130			
Tetrachloroethene	47.8	2.5	50	0	96	65	130			
1,1,1,2-Tetrachloroethane	47.7	2.5	50	0	95	70	130			
Chlorobenzene	46.4	2.5	50	0	93	70	130			
Ethylbenzene	51.3	1.3	50	0	103	68	130			
m,p-Xylene	49.7	1.3	50	0	99	68	131			
Bromoform	40.1	2.5	50	0	80	65	143			
Styrene	42.7	2.5	50	0	85	59	153			
o-Xylene	49.6	1.3	50	0	99	70	130			
1,1,2,2-Tetrachloroethane	43.4	2.5	50	0	87	67	130			
1,2,3-Trichloropropane	93.2	10	100	0	93	70	130			
Isopropylbenzene	47.6	2.5	50	0	95	55	138			
Bromobenzene	47.9	2.5	50	0	96	70	130			
n-Propylbenzene	48.9	2.5	50	0	98	67	133			
4-Chlorotoluene	46.5	2.5	50	0	93	70	130			
2-Chlorotoluene	46.4	2.5	50	0	93	70	130			
1,3,5-Trimethylbenzene	50.7	2.5	50	0	101	67	134			
tert-Butylbenzene	48.7	2.5	50	0	97	55	147			
1,2,4-Trimethylbenzene	50.1	2.5	50	0	100	65	135			
sec-Butylbenzene	48.1	2.5	50	0	96	68	135			
1,3-Dichlorobenzene	50	2.5	50	0	100	70	130			
1,4-Dichlorobenzene	45.7	2.5	50	0	91	70	130			
4-Isopropyltoluene	50.4	2.5	50	0	101	68	132			
1,2-Dichlorobenzene	45.3	2.5	50	0	91	70	130			
n-Butylbenzene	51.9	2.5	50	0	104	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	221	15	250	0	88	64	130			
1,2,4-Trichlorobenzene	44.6	10	50	0	89	62	133			
Naphthalene	37.1	10	50	0	74	32	166			
Hexachlorobutadiene	104	10	100	0	104	63	130			
1,2,3-Trichlorobenzene	43.5	10	50	0	87	55	138			
Surr: 1,2-Dichloroethane-d4	54.3		50		109	70	130			
Surr: Toluene-d8	47.4		50		95	70	130			



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**Date:**  
08-Sep-11

## QC Summary Report

**Work Order:**  
11082601

Surr: 4-Bromofluorobenzene

46.2

50

92

70

130



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Date:

08-Sep-11

## QC Summary Report

Work Order:

11082601

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11090109.D

Batch ID: MS15W0901M

Analysis Date: 09/01/2011 11:01

Sample ID: 11082601-02AMSD

Units : µg/L

Run ID: MSD\_15\_110901B

Prep Date: 09/01/2011 11:01

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	38.2	2.5	50	0	76	21	138	37.9	0.7(33)	
Chloromethane	53.1	10	50	0	106	23	144	50.57	4.9(27)	
Vinyl chloride	56.1	2.5	50	0	112	49	136	55.67	0.8(21)	
Chloroethane	60.1	2.5	50	0	120	21	159	59.37	1.3(40)	
Bromomethane	47	10	50	0	94	10	174	39.48	17.4(40)	
Trichlorofluoromethane	60	2.5	50	0	120	32	154	61.09	1.8(37)	
1,1-Dichloroethene	45.9	2.5	50	0	92	64	130	45.77	0.3(21)	
Dichloromethane	45.4	10	50	0	91	69	130	45.33	0.1(20)	
Freon-113	52	2.5	50	0	104	55	141	51.82	0.3(40)	
trans-1,2-Dichloroethene	47.4	2.5	50	0	95	63	130	47.41	0.0(20)	
Methyl tert-butyl ether (MTBE)	50.2	1.3	50	0	100	47	150	48.42	3.5(40)	
1,1-Dichloroethane	48.6	2.5	50	0	97	66	130	48.14	0.8(20)	
2-Butanone (MEK)	897	50	1000	0	90	23	182	868.2	3.2(22)	
cis-1,2-Dichloroethene	48.6	2.5	50	0	97	70	130	48.5	0.2(20)	
Bromochloromethane	50.4	2.5	50	0	101	70	132	49.35	2.1(20)	
Chloroform	50.3	2.5	50	0	101	70	130	50.5	0.4(20)	
2,2-Dichloropropane	49.7	2.5	50	0	99	38	154	49.04	1.3(22)	
1,2-Dichloroethane	52.4	2.5	50	0	105	65	134	51.49	1.7(20)	
1,1,1-Trichloroethane	51	2.5	50	0	102	65	136	51.08	0.2(20)	
1,1-Dichloropropene	51.8	2.5	50	0	104	68	132	51.76	0.0(20)	
Carbon tetrachloride	50.9	2.5	50	0	102	58	148	50.02	1.8(20)	
Benzene	49.8	1.3	50	0	99.6	59	138	49.56	0.5(21)	
Dibromomethane	50.8	2.5	50	0	102	70	130	49.74	2.2(20)	
1,2-Dichloropropane	47.8	2.5	50	0	96	70	131	47.43	0.7(20)	
Trichloroethene	49	2.5	50	0	98	65	144	48.54	1.0(20)	
Bromodichloromethane	50.2	2.5	50	0	100	50	157	49.11	2.2(20)	
4-Methyl-2-pentanone (MIBK)	132	13	125	0	105	20	182	126.5	3.9(20)	
cis-1,3-Dichloropropene	46.7	2.5	50	0	93	63	131	45.54	2.6(20)	
trans-1,3-Dichloropropene	44.2	2.5	50	0	88	65	136	42.98	2.7(20)	
1,1,2-Trichloroethane	49.9	2.5	50	0	99.7	70	131	49.08	1.6(20)	
Toluene	48.5	1.3	50	0	97	68	130	47.68	1.6(20)	
1,3-Dichloropropane	47.3	2.5	50	0	95	70	130	45.63	3.7(20)	
Dibromochloromethane	42.8	2.5	50	0	86	42	155	40.93	4.4(20)	
1,2-Dibromoethane (EDB)	95.8	5	100	0	96	70	130	92.39	3.7(20)	
Tetrachloroethene	48.9	2.5	50	0	98	65	130	47.84	2.3(20)	
1,1,1,2-Tetrachloroethane	48.7	2.5	50	0	97	70	130	47.65	2.1(20)	
Chlorobenzene	47.6	2.5	50	0	95	70	130	46.35	2.6(20)	
Ethylbenzene	52.1	1.3	50	0	104	68	130	51.26	1.7(20)	
m,p-Xylene	50.7	1.3	50	0	101	68	131	49.71	1.9(20)	
Bromoform	41.8	2.5	50	0	84	65	143	40.08	4.1(20)	
Styrene	43.8	2.5	50	0	88	59	153	42.73	2.5(37)	
o-Xylene	50.6	1.3	50	0	101	70	130	49.59	2.0(20)	
1,1,2,2-Tetrachloroethane	45.1	2.5	50	0	90	67	130	43.42	3.7(20)	
1,2,3-Trichloropropane	98.1	10	100	0	98	70	130	93.22	5.1(20)	
Isopropylbenzene	47.4	2.5	50	0	95	55	138	47.56	0.4(20)	
Bromobenzene	48.5	2.5	50	0	97	70	130	47.93	1.1(20)	
n-Propylbenzene	48.7	2.5	50	0	97	67	133	48.89	0.3(30)	
4-Chlorotoluene	47.2	2.5	50	0	94	70	130	46.52	1.4(20)	
2-Chlorotoluene	46.7	2.5	50	0	93	70	130	46.42	0.5(20)	
1,3,5-Trimethylbenzene	50.5	2.5	50	0	101	67	134	50.66	0.3(21)	
tert-Butylbenzene	49.1	2.5	50	0	98	55	147	48.66	0.9(20)	
1,2,4-Trimethylbenzene	50.4	2.5	50	0	101	65	135	50.13	0.6(25)	
sec-Butylbenzene	48.6	2.5	50	0	97	68	135	48.1	1.0(20)	
1,3-Dichlorobenzene	50.6	2.5	50	0	101	70	130	50	1.1(20)	
1,4-Dichlorobenzene	46.6	2.5	50	0	93	70	130	45.68	2.0(20)	
4-Isopropyltoluene	50.4	2.5	50	0	101	68	132	50.41	0.1(20)	
1,2-Dichlorobenzene	45.9	2.5	50	0	92	70	130	45.31	1.4(20)	
n-Butylbenzene	52.2	2.5	50	0	104	62	134	51.87	0.6(21)	
1,2-Dibromo-3-chloropropane (DBCP)	231	15	250	0	92	64	130	221.1	4.3(20)	
1,2,4-Trichlorobenzene	46.8	10	50	0	94	62	133	44.56	5.0(29)	
Naphthalene	41.1	10	50	0	82	32	166	37.12	10.1(40)	
Hexachlorobutadiene	109	10	100	0	109	63	130	104	5.0(21)	
1,2,3-Trichlorobenzene	47.2	10	50	0	94	55	138	43.53	8.1(36)	
Surr: 1,2-Dichloroethane-d4	53.4		50		107	70	130			
Surr: Toluene-d8	47.8		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:**

08-Sep-11

## QC Summary Report

**Work Order:**

11082601

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Surr: 4-Bromofluorobenzene	46.9	50	94	70	130
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**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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L51 = Analyte recovery was above acceptance limits for the LCS, but was acceptable in the MS/MSD.



Billing Information :

**CHAIN-OF-CUSTODY RECORD**

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

**CA**

**WorkOrder : BMIS11082601**  
**Report Due By : 5:00 PM On : 09-Sep-2011**

**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@battelle.org  
 Shane Walton    (614) 424-4117 x    waltonss@battelle.org

EDD Required : Yes

Sampled by : Chase Brogdon, D. Loera

PO : 287215  
 Client's COC # : 25562, 25563, 024302

Job : 100006114/JPL Groundwater Monitoring

Sample Temp    Samples Received    Date Printed  
 0 °C    26-Aug-2011    26-Aug-2011

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

Alpha Sample ID	Client Sample ID	Collection Date	No. of Bottles	Alpha Sub	TAT	Requested Tests			Sample Remarks
						300_0_W	314_W	METALS_D W	
BM111082601-01A	MW-17-4	08/25/11 08:51	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	
BM111082601-02A	MW-17-3	08/25/11 09:23	10	0	9	Perchlorate	Cr	VOC by 524 Criteria	MS/MSD
BM111082601-03A	MW-17-2	08/25/11 09:53	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	
BM111082601-04A	EB-03-8/25/11	08/25/11 09:42	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	Sample time taken from sample containers.
BM111082601-05A	TB-03-8/25/11	08/25/11 07:30	1	0	9	Perchlorate	Cr	VOC by 524 Criteria	Reno Trip Blank 4/6/11
BM111082601-06A	MW-18-5	08/25/11 11:13	4	0	9	Perchlorate	Cr	VOC by 524 Criteria	
BM111082601-07A	MW-18-4	08/25/11 11:44	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	Level IV QC
BM111082601-08A	MW-18-3	08/25/11 12:13	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	
BM111082601-09A	MW-18-2	08/25/11 12:51	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	
BM111082601-10A	DUPE-03-3Q11	08/25/11 00:00	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	

Comments: Security seals intact. Frozen ice. Temp Blank #9136 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (L.E.: MS/MSD).

Logged in by: Empath    Signature: [Signature]    Print Name: Elizaboth Adcox    Company: Alpha Analytical, Inc.    Date/Time: 8:26:11 10/23

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) SQ(Soil) WS(Waste) DW(Drinking Water) OT(Other)    Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedar B-Brass P-Plastic OT-Other

# 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 : BMIS11082601**  
**Report Due By : 5:00 PM On : 09-Sep-2011**

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

Report Attention	Phone Number	Email Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutieec@battelle.org
Shane Walton	(614) 424-4117 x	waltonsh@battelle.org

EDD Required : Yes

Sampled by : Chase Brogdon, D. Loera

Cooler Temp 0 °C Samples Received 26-Aug-2011 Date Printed 26-Aug-2011

Client's COC # : 25562, 25563, 024302 Job : 100006114/JPL Groundwater Monitoring  
 QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles			Requested Tests			Sample Remarks		
			Alpha	Sub	TAT	300_0_W	314_W	METALS_D W		VOC_TIC_W	VOC_W
BM111082601-11A	MW-13	AQ 08/25/11 08:43	7	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Cr	VOC By 524 Criteria	VOC By 524 Criteria	
BM111082601-12A	MW-5	AQ 08/25/11 11:00	5	0	9		Perchlorate	Cr	VOC By 524 Criteria	VOC By 524 Criteria	
BM111082601-13A	MW-10	AQ 08/25/11 13:57	5	0	9		Perchlorate	Cr	VOC By 524 Criteria	VOC By 524 Criteria	

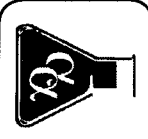
**Comments:** Security seals intact. Frozen ice. Temp Blank #9136 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD):

Signature	Print Name	Company	Date/Time
<i>Elizabeth Aldcox</i>	Elizabeth Aldcox	Alpha Analytical, Inc.	8-26-11 10:23

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:**

Name BATTLE GERRARD TOMPKINS  
 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?** 25562  
 AZ  CA  NV  WA   
 ID  OR  OTHER   
 Page # 1 of 1

Analyses Required

Client Name BATTLE/DAVID CONNER PO. # 287215 Job # 660562 100006114  
 Address 3940 OLD TOWN AVE C-205 Email Address CONNERR@BATTLE.ORG  
 City, State, Zip SPAIN PIETRO OH 92210 Phone # (619) 726-7311 Fax # (619) 458-6614

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by Lab ID Number (Use Only)	Office (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Required QC Level?	EDD/EDF? YES NO	Global ID #	REMARKS
0851	8/25/11	Air	BMT1108260101		DAVID CONNER	MW - 17-4	Norm		S/Vary	<input checked="" type="checkbox"/>			M/S / MSD
0923	8/25/11					MW - 17-3			10/Vary	<input checked="" type="checkbox"/>			
0933	8/25/11					MW - 17-2			S/Vary	<input checked="" type="checkbox"/>			
0936	8/25/11								3V ZP	<input checked="" type="checkbox"/>			COMPONENT BLANK
	8/25/11								1V	<input checked="" type="checkbox"/>			TRAP BLANK

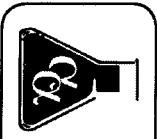
**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHASE BLANDON	INSIGHT	8/25/11	1530
<i>[Signature]</i>	Anthony Star	Alpha Analytical	8/25/11	1530
<i>[Signature]</i>	Elizabeth Adcox	Alpha	8/26/11	1023

\*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 BATTELLE / GERALD TRUMPKINS  
 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?** 25563  
 AZ  CA  NV  WA   
 ID  OR  OTHER   
 Page # 1 of 1

Analyses Required

Client Name BATTELLE / DAVID CONNER PO # 287215 Job # 10006114  
 Address 390 OLD TOWN AVE C-205 Email Address CONNERD@BATTELLE.ORG  
 City, State, Zip San Diego, CA 92110 Phone # (619) 726-7311 Fax # 614 458 6614

Time Sampled	Date Sampled	Matrix See Key Below	Sampled by	Lab ID Number (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (3140)	Global ID #	REMARKS
11/13	8/25/11	AD	CHUCK BARNARD		DAVID CONNER	MW - 18 - 5	Normal		4 Vials	X	X	X		LEVEL IV QC
11/14	8/25/11					MW - 18 - 4			5 Vials	X	X	X		
12/13	8/25/11					MW - 18 - 3			5 Vials	X	X	X		
12/13	8/25/11					MW - 18 - 2			5 Vials	X	X	X		
	8/25/11					DUPE - 03 - 3011			5 Vials	X	X	X		DUPLICATE

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHUCK BARNARD	INTEGRITY ANALYTICAL	8/25/11	1530
<i>[Signature]</i>	Anthony Stark	Alpha	8/25/11	1530
<i>[Signature]</i>	Elizabeth Adcox	Alpha	8.26.11	1023

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Liter V-Vol S-Soil Jar O-Orho T-Teclar 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.





# Alpha Analytical, Inc.

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

Date: 12-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11083003

Cooler Temp: 0°C

Alpha's Sample ID	Client's Sample ID	Matrix
11083003-01A	MW-23-4	Aqueous
11083003-02A	MW-23-3	Aqueous
11083003-03A	MW-23-2	Aqueous
11083003-04A	MW-23-1	Aqueous
11083003-05A	EB-04-8/26/11	Aqueous
11083003-06A	TB-04-8/26/11	Aqueous
11083003-07A	MW-24-4	Aqueous
11083003-08A	MW-24-3	Aqueous
11083003-09A	MW-24-2	Aqueous
11083003-10A	MW-24-1	Aqueous
11083003-11A	EB-05-8/29/11	Aqueous
11083003-12A	TB-05-8/29/11	Aqueous
11083003-13A	MW-6	Aqueous
11083003-14A	DUPE-7-3Q11	Aqueous
11083003-15A	MW-16	Aqueous
11083003-16A	MW-15	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11083003-02A	EPA Method 314.0	Perchlorate
11083003-03A	EPA Method 314.0	Perchlorate
11083003-04A	EPA Method 314.0	Perchlorate
11083003-09A	EPA Method 314.0	Perchlorate
11083003-10A	EPA Method 314.0	Perchlorate
11083003-13A	EPA Method 314.0	Perchlorate
11083003-14A	EPA Method 314.0	Perchlorate
11083003-15A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/30/11

Job: 100006114/JPL Groundwater Monitoring

### Anions by IC EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-24-1</b>				
Lab ID : BM111083003-10A Chloride	68	0.50 mg/L	08/30/11 13:43	08/30/11 21:05
Date Sampled 08/29/11 11:11 Nitrite (NO2) - N	ND	0.25 mg/L	08/30/11 13:43	08/30/11 21:05
Nitrate (NO3) - N	1.2	0.25 mg/L	08/30/11 13:43	08/30/11 21:05
Phosphate, ortho - P	ND	0.50 mg/L	08/30/11 13:43	08/30/11 21:05
Sulfate (SO4)	46	0.50 mg/L	08/30/11 13:43	08/30/11 21:05
Client ID: <b>MW-16</b>				
Lab ID : BM111083003-15A Chloride	57	0.50 mg/L	08/30/11 13:43	08/30/11 22:01
Date Sampled 08/29/11 12:40 Nitrite (NO2) - N	ND	0.25 mg/L	08/30/11 13:43	08/30/11 22:01
Nitrate (NO3) - N	1.3	0.25 mg/L	08/30/11 13:43	08/30/11 22:01
Phosphate, ortho - P	0.69	0.50 mg/L	08/30/11 13:43	08/30/11 22:01
Sulfate (SO4)	44	0.50 mg/L	08/30/11 13:43	08/30/11 22:01

ND = Not Detected

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.

9/12/11

Report Date



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/30/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-23-3</b>				
Lab ID : BMI11083003-02A Perchlorate	1.19	1.00 µg/L	08/31/11 11:06	08/31/11 16:27
Date Sampled 08/26/11 09:55				
Client ID: <b>MW-23-2</b>				
Lab ID : BMI11083003-03A Perchlorate	3.00	1.00 µg/L	08/31/11 11:06	08/31/11 17:22
Date Sampled 08/26/11 10:16				
Client ID: <b>MW-23-1</b>				
Lab ID : BMI11083003-04A Perchlorate	9.66	1.00 µg/L	08/31/11 11:06	08/31/11 17:40
Date Sampled 08/26/11 10:43				
Client ID: <b>EB-04-8/26/11</b>				
Lab ID : BMI11083003-05A Perchlorate	ND	1.00 µg/L	08/31/11 11:06	08/31/11 17:59
Date Sampled 08/26/11 10:33				
Client ID: <b>MW-24-3</b>				
Lab ID : BMI11083003-08A Perchlorate	ND	1.00 µg/L	08/31/11 11:06	08/31/11 18:17
Date Sampled 08/29/11 10:20				
Client ID: <b>MW-24-2</b>				
Lab ID : BMI11083003-09A Perchlorate	33.0	1.00 µg/L	08/31/11 11:06	08/31/11 18:35
Date Sampled 08/29/11 10:45				
Client ID: <b>MW-24-1</b>				
Lab ID : BMI11083003-10A Perchlorate	12.2	1.00 µg/L	08/31/11 11:06	08/31/11 18:54
Date Sampled 08/29/11 11:11				
Client ID: <b>EB-05-8/29/11</b>				
Lab ID : BMI11083003-11A Perchlorate	ND	1.00 µg/L	08/31/11 11:06	08/31/11 19:12
Date Sampled 08/29/11 10:59				
Client ID: <b>MW-6</b>				
Lab ID : BMI11083003-13A Perchlorate	2.56	1.00 µg/L	08/31/11 11:06	08/31/11 19:31
Date Sampled 08/29/11 09:49				
Client ID: <b>DUPE-7-3Q11</b>				
Lab ID : BMI11083003-14A Perchlorate	2.23	1.00 µg/L	08/31/11 11:06	08/31/11 19:49
Date Sampled 08/29/11 09:55				
Client ID: <b>MW-16</b>				
Lab ID : BMI11083003-15A Perchlorate	2.48	1.00 µg/L	08/31/11 11:06	08/31/11 20:08
Date Sampled 08/29/11 12:40				





# Alpha Analytical, Inc.

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

---

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.

*A*  
9/12/11

**Report Date**



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/30/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-23-4</b> Lab ID : BM111083003-01A Chromium (Cr) Date Sampled 08/26/11 09:33	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:22
Client ID: <b>MW-23-3</b> Lab ID : BM111083003-02A Chromium (Cr) Date Sampled 08/26/11 09:55	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:28
Client ID: <b>MW-23-2</b> Lab ID : BM111083003-03A Chromium (Cr) Date Sampled 08/26/11 10:16	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:34
Client ID: <b>MW-23-1</b> Lab ID : BM111083003-04A Chromium (Cr) Date Sampled 08/26/11 10:43	0.0072	0.0050 mg/L	09/02/11 18:05	09/06/11 19:58
Client ID: <b>EB-04-8/26/11</b> Lab ID : BM111083003-05A Chromium (Cr) Date Sampled 08/26/11 10:33	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:40
Client ID: <b>MW-24-4</b> Lab ID : BM111083003-07A Chromium (Cr) Date Sampled 08/29/11 09:58	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:46
Client ID: <b>MW-24-3</b> Lab ID : BM111083003-08A Chromium (Cr) Date Sampled 08/29/11 10:20	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:52
Client ID: <b>MW-24-2</b> Lab ID : BM111083003-09A Chromium (Cr) Date Sampled 08/29/11 10:45	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:58
Client ID: <b>MW-24-1</b> Lab ID : BM111083003-10A Chromium (Cr) Date Sampled 08/29/11 11:11	0.0079	0.0050 mg/L	09/02/11 18:05	09/06/11 21:04
Client ID: <b>EB-05-8/29/11</b> Lab ID : BM111083003-11A Chromium (Cr) Date Sampled 08/29/11 10:59	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:33
Client ID: <b>MW-6</b> Lab ID : BM111083003-13A Chromium (Cr) Date Sampled 08/29/11 09:49	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:39



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Client ID: **DUPE-7-3Q11**

Lab ID : BMII1083003-14A Chromium (Cr) ND 0.0050 mg/L 09/02/11 18:05 09/06/11 21:45  
Date Sampled 08/29/11 09:55

Client ID: **MW-16**

Lab ID : BMII1083003-15A Chromium (Cr) 0.0051 0.0050 mg/L 09/02/11 18:05 09/06/11 21:51  
Date Sampled 08/29/11 12:40

Client ID: **MW-15**

Lab ID : BMII1083003-16A Chromium (Cr) ND 0.0050 mg/L 09/02/11 18:05 09/06/11 21:57  
Date Sampled 08/29/11 14:28

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

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**9/12/11**

**Report Date**



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-23-3</b> Lab ID : <b>BMI11083003-02A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/26/11 09:55	ND	2.0 µg/L	09/02/11 13:58	09/02/11 13:58
Client ID : <b>MW-23-2</b> Lab ID : <b>BMI11083003-03A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/26/11 10:16	ND	2.0 µg/L	09/02/11 14:19	09/02/11 14:19
Client ID : <b>MW-23-1</b> Lab ID : <b>BMI11083003-04A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/26/11 10:43	ND	2.0 µg/L	09/02/11 14:41	09/02/11 14:41
Client ID : <b>EB-04-8/26/11</b> Lab ID : <b>BMI11083003-05A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/26/11 10:33	ND	2.0 µg/L	09/02/11 12:31	09/02/11 12:31
Client ID : <b>TB-04-8/26/11</b> Lab ID : <b>BMI11083003-06A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/26/11 08:00	ND	2.0 µg/L	09/02/11 12:53	09/02/11 12:53
Client ID : <b>MW-24-3</b> Lab ID : <b>BMI11083003-08A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/29/11 10:20	ND	2.0 µg/L	09/02/11 15:02	09/02/11 15:02
Client ID : <b>MW-24-2</b> Lab ID : <b>BMI11083003-09A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/29/11 10:45	ND	2.0 µg/L	09/02/11 15:24	09/02/11 15:24
Client ID : <b>MW-24-1</b> Lab ID : <b>BMI11083003-10A</b> Sulfur dioxide Date Received : 08/30/11 Date Sampled : 08/29/11 11:11	4.5	2.0 µg/L	09/02/11 15:45	09/02/11 15:45
Client ID : <b>EB-05-8/29/11</b> Lab ID : <b>BMI11083003-11A</b> *** None Found *** Date Received : 08/30/11 Date Sampled : 08/29/11 10:59	ND	2.0 µg/L	09/02/11 13:15	09/02/11 13:15



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Client ID :	<b>TB-05-8/29/11</b>					
Lab ID :	BMI11083003-12A	*** None Found ***	ND	2.0 µg/L	09/02/11 13:36	09/02/11 13:36
Date Received :	08/30/11					
Date Sampled :	08/29/11 07:45					
Client ID :	<b>MW-6</b>					
Lab ID :	BMI11083003-13A	*** None Found ***	ND	2.0 µg/L	09/02/11 16:07	09/02/11 16:07
Date Received :	08/30/11					
Date Sampled :	08/29/11 09:49					
Client ID :	<b>DUPE-7-3Q11</b>					
Lab ID :	BMI11083003-14A	*** None Found ***	ND	2.0 µg/L	09/02/11 16:28	09/02/11 16:28
Date Received :	08/30/11					
Date Sampled :	08/29/11 09:55					
Client ID :	<b>MW-16</b>					
Lab ID :	BMI11083003-15A	*** None Found ***	ND	2.0 µg/L	09/02/11 16:50	09/02/11 16:50
Date Received :	08/30/11					
Date Sampled :	08/29/11 12:40					

Note: Analysis conducted using EPA Method 524.2 criteria.  
ND = Not Detected

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

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-02A  
Client I.D. Number: MW-23-3

Sampled: 08/26/11 09:55  
Received: 08/30/11  
Extracted: 09/02/11 13:58  
Analyzed: 09/02/11 13:58

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-03A  
Client I.D. Number: MW-23-2

Sampled: 08/26/11 10:16  
Received: 08/30/11  
Extracted: 09/02/11 14:19  
Analyzed: 09/02/11 14:19

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	0.58	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	2.0	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	0.87	0.50 µg/L			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-04A  
Client I.D. Number: MW-23-1

Sampled: 08/26/11 10:43  
Received: 08/30/11  
Extracted: 09/02/11 14:41  
Analyzed: 09/02/11 14:41

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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 Trichloroethane	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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 Tetrachloroethane	ND	0.50 µg/L			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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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.

9/12/11

Report Date





# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-05A  
Client I.D. Number: EB-04-8/26/11

Sampled: 08/26/11 10:33  
Received: 08/30/11  
Extracted: 09/02/11 12:31  
Analyzed: 09/02/11 12:31

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/12/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-06A  
Client I.D. Number: TB-04-8/26/11

Sampled: 08/26/11 08:00  
Received: 08/30/11  
Extracted: 09/02/11 12:53  
Analyzed: 09/02/11 12:53

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

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  
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9/12/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-08A  
Client I.D. Number: MW-24-3

Sampled: 08/29/11 10:20  
Received: 08/30/11  
Extracted: 09/02/11 15:02  
Analyzed: 09/02/11 15:02

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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9/12/11

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Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-09A  
Client I.D. Number: MW-24-2

Sampled: 08/29/11 10:45  
Received: 08/30/11  
Extracted: 09/02/11 15:24  
Analyzed: 09/02/11 15:24

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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-Dichloroethane	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	0.68	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	1.3	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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9/12/11

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# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-10A  
Client I.D. Number: MW-24-1

Sampled: 08/29/11 11:11  
Received: 08/30/11  
Extracted: 09/02/11 15:45  
Analyzed: 09/02/11 15:45

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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-Dichloroethane	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	6.4	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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.

9/12/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-11A  
Client I.D. Number: EB-05-8/29/11

Sampled: 08/29/11 10:59  
Received: 08/30/11  
Extracted: 09/02/11 13:15  
Analyzed: 09/02/11 13:15

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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-Dichloroethane	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

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  
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9/12/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-12A  
Client I.D. Number: TB-05-8/29/11

Sampled: 08/29/11 07:45  
Received: 08/30/11  
Extracted: 09/02/11 13:36  
Analyzed: 09/02/11 13:36

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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-Dichloroethane	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

*Roger Scholl*      *Randy Gardner*      *Walter Hinchman*  
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9/12/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-13A  
Client I.D. Number: MW-6

Sampled: 08/29/11 09:49  
Received: 08/30/11  
Extracted: 09/02/11 16:07  
Analyzed: 09/02/11 16:07

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	0.55	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	2.7	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	1.1	0.50 µg/L			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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9/12/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-14A  
Client I.D. Number: DUPE-7-3Q11

Sampled: 08/29/11 09:55  
Received: 08/30/11  
Extracted: 09/02/11 16:28  
Analyzed: 09/02/11 16:28

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 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	0.54	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	2.6	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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	1.0	0.50 µg/L			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083003-15A  
Client I.D. Number: MW-16

Sampled: 08/29/11 12:40  
Received: 08/30/11  
Extracted: 09/02/11 16:50  
Analyzed: 09/02/11 16:50

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	Q 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	Q 1.0 µg/L	40 Bromoform	2.6	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	8.9	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	8.0	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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(70-130) %REC
32 1,3-Dichloropropane	ND	0.50 µg/L			
33 Dibromochloromethane	5.8	0.50 µg/L			
34 1,2-Dibromoethane (EDB)	ND	1.0 µg/L			
35 Tetrachloroethene	ND	0.50 µg/L			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

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.

9/12/11

Report Date



# Alpha Analytical, Inc.

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## VOC Sample Preservation Report

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**Work Order:** BMI11083003

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11083003-02A	MW-23-3	Aqueous	2
11083003-03A	MW-23-2	Aqueous	2
11083003-04A	MW-23-1	Aqueous	2
11083003-05A	EB-04-8/26/11	Aqueous	2
11083003-06A	TB-04-8/26/11	Aqueous	2
11083003-08A	MW-24-3	Aqueous	2
11083003-09A	MW-24-2	Aqueous	2
11083003-10A	MW-24-1	Aqueous	2
11083003-11A	EB-05-8/29/11	Aqueous	2
11083003-12A	TB-05-8/29/11	Aqueous	2
11083003-13A	MW-6	Aqueous	2
11083003-14A	DUPE-7-3Q11	Aqueous	2
11083003-15A	MW-16	Aqueous	2

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9/12/11

**Report Date**

Page 1 of 1



# Alpha Analytical, Inc.

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Date:  
02-Sep-11

## QC Summary Report

Work Order:  
11083003

### Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0**

File ID: **48**

Batch ID: **27215**

Analysis Date: **08/30/2011 20:09**

Sample ID: **MB-27215**

Units : **mg/L**

Run ID: **IC\_1\_110830B**

Prep Date: **08/30/2011 13:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

### Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0**

File ID: **49**

Batch ID: **27215**

Analysis Date: **08/30/2011 20:29**

Sample ID: **LFB-27215**

Units : **mg/L**

Run ID: **IC\_1\_110830B**

Prep Date: **08/30/2011 13:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	48.7	0.5	50		97	90	110			
Nitrite (NO2) - N	4.74	0.25	5		95	90	110			
Nitrate (NO3) - N	5.3	0.25	5		106	90	110			
Phosphate, ortho - P	5.08	0.5	5		102	90	110			
Sulfate (SO4)	99.3	0.5	100		99	90	110			

### Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0**

File ID: **52**

Batch ID: **27215**

Analysis Date: **08/30/2011 21:24**

Sample ID: **11083003-10ALFM**

Units : **mg/L**

Run ID: **IC\_1\_110830B**

Prep Date: **08/30/2011 13:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	164	0.5	100	68.2	96	80	120			
Nitrite (NO2) - N	10.6	0.25	10	0	106	80	120			
Nitrate (NO3) - N	11.7	0.25	10	1.183	106	80	120			
Phosphate, ortho - P	12.2	0.5	10	0	122	80	120			M1
Sulfate (SO4)	239	0.5	200	45.88	96	80	120			

### Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0**

File ID: **53**

Batch ID: **27215**

Analysis Date: **08/30/2011 21:42**

Sample ID: **11083003-10ALFMD**

Units : **mg/L**

Run ID: **IC\_1\_110830B**

Prep Date: **08/30/2011 13:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	164	0.5	100	68.2	95	80	120	164.1	0.3(15)	
Nitrite (NO2) - N	10.4	0.25	10	0	104	80	120	10.58	1.3(15)	
Nitrate (NO3) - N	11.6	0.25	10	1.183	104	80	120	11.73	1.0(15)	
Phosphate, ortho - P	11.3	0.5	10	0	113	80	120	12.19	7.9(15)	
Sulfate (SO4)	237	0.5	200	45.88	96	80	120	238.6	0.5(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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.



# Alpha Analytical, Inc.

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Date:  
06-Sep-11

## QC Summary Report

Work Order:  
11083003

### Method Blank

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

File ID: **14** Batch ID: **27222** Analysis Date: **08/31/2011 12:09**  
Sample ID: **MB-27222** Units : **µg/L** Run ID: **IC\_3\_110831A** Prep Date: **08/31/2011 11:06**  
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: **15** Batch ID: **27222** Analysis Date: **08/31/2011 12:27**  
Sample ID: **LFB-27222** Units : **µg/L** Run ID: **IC\_3\_110831A** Prep Date: **08/31/2011 11:06**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 24.3 2 25 97 85 115

### Sample Matrix Spike

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

File ID: **21** Batch ID: **27222** Analysis Date: **08/31/2011 14:18**  
Sample ID: **11082403-04ALFM** Units : **µg/L** Run ID: **IC\_3\_110831A** Prep Date: **08/31/2011 11:06**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 26.4 2 25 4.997 86 80 120

### Sample Matrix Spike Duplicate

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

File ID: **22** Batch ID: **27222** Analysis Date: **08/31/2011 14:36**  
Sample ID: **11082403-04ALFMD** Units : **µg/L** Run ID: **IC\_3\_110831A** Prep Date: **08/31/2011 11:06**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 27.1 2 25 4.997 89 80 120 26.42 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: 12-Sep-11 **QC Summary Report** Work Order: 11083003

### Method Blank

File ID: 090611.B\070_M.D\	Type: MBLK	Test Code: EPA Method 200.8	Batch ID: 27242	Analysis Date: 09/06/2011 19:29
Sample ID: MB-27242	Units : mg/L	Run ID: ICP/MS_110906D	Prep Date: 09/02/2011 18:05	
Analyte	Result	PQL	SpkVal	SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual
Chromium (Cr)	ND	0.005		

### Laboratory Control Spike

File ID: 090611.B\071_M.D\	Type: LCS	Test Code: EPA Method 200.8	Batch ID: 27242	Analysis Date: 09/06/2011 19:35
Sample ID: LCS-27242	Units : mg/L	Run ID: ICP/MS_110906D	Prep Date: 09/02/2011 18:05	
Analyte	Result	PQL	SpkVal	SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual
Chromium (Cr)	0.0512	0.005	0.05	102 85 115

### Sample Matrix Spike

File ID: 090611.B\076_M.D\	Type: MS	Test Code: EPA Method 200.8	Batch ID: 27242	Analysis Date: 09/06/2011 20:04
Sample ID: 11083003-04AMS	Units : mg/L	Run ID: ICP/MS_110906D	Prep Date: 09/02/2011 18:05	
Analyte	Result	PQL	SpkVal	SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual
Chromium (Cr)	0.0563	0.005	0.05	0.007226 98 70 130

### Sample Matrix Spike Duplicate

File ID: 090611.B\077_M.D\	Type: MSD	Test Code: EPA Method 200.8	Batch ID: 27242	Analysis Date: 09/06/2011 20:10
Sample ID: 11083003-04AMSD	Units : mg/L	Run ID: ICP/MS_110906D	Prep Date: 09/02/2011 18:05	
Analyte	Result	PQL	SpkVal	SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual
Chromium (Cr)	0.0559	0.005	0.05	0.007226 97 70 130 0.05627 0.7(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:  
12-Sep-11

## QC Summary Report

Work Order:  
11083003

### Method Blank

Type: MBLK Test Code: EPA Method SW8260B

File ID: 11090206.D

Batch ID: MS15W0902M

Analysis Date: 09/02/2011 10:22

Sample ID: MBLK MS15W0902M

Units: µg/L

Run ID: MSD\_15\_110902B

Prep Date: 09/02/2011 10:22

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	10.6		10		106	70	130			
Surr: Toluene-d8	9.81		10		98	70	130			



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**Date:**  
*12-Sep-11*

## QC Summary Report

**Work Order:**  
11083003

Surr: 4-Bromofluorobenzene

9

10

90

70

130





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Date:  
12-Sep-11

## QC Summary Report

Work Order:  
11083003

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11090204.D

Batch ID: MS15W0902M

Analysis Date: 09/02/2011 09:27

Sample ID: LCS MS15W0902M

Units: µg/L

Run ID: MSD\_15\_110902B

Prep Date: 09/02/2011 09:27

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	6.37	1	10		64	70(70)	130			L50
Chloromethane	9.31	2	10		93	70	130			
Vinyl chloride	8.53	1	10		85	70	130			
Chloroethane	10.2	1	10		102	70	130			
Bromomethane	6.32	2	10		63	70(70)	130			L50
Trichlorofluoromethane	10.2	1	10		102	70	130			
1,1-Dichloroethene	8.36	1	10		84	70	130			
Dichloromethane	8.48	2	10		85	70	130			
Freon-113	8.71	1	10		87	70	137			
trans-1,2-Dichloroethene	8.77	1	10		88	70	130			
Methyl tert-butyl ether (MTBE)	9.4	0.5	10		94	70	130			
1,1-Dichloroethane	8.75	1	10		88	70	130			
2-Butanone (MEK)	243	10	200		121	70	130			
cis-1,2-Dichloroethene	8.81	1	10		88	70	130			
Bromochloromethane	9.2	1	10		92	70	130			
Chloroform	9.14	1	10		91	70	130			
2,2-Dichloropropane	8.82	1	10		88	70	130			
1,2-Dichloroethane	9.6	1	10		96	70	130			
1,1,1-Trichloroethane	9.21	1	10		92	70	130			
1,1-Dichloropropene	9.32	1	10		93	70	130			
Carbon tetrachloride	8.72	1	10		87	70	130			
Benzene	9.02	0.5	10		90	70	130			
Dibromomethane	9.38	1	10		94	70	130			
1,2-Dichloropropane	8.66	1	10		87	70	130			
Trichloroethene	8.91	1	10		89	70	130			
Bromodichloromethane	8.96	1	10		90	70	130			
4-Methyl-2-pentanone (MIBK)	26.3	2.5	25		105	20	182			
cis-1,3-Dichloropropene	8.74	1	10		87	70	130			
trans-1,3-Dichloropropene	8.16	1	10		82	70	130			
1,1,2-Trichloroethane	9.28	1	10		93	70	130			
Toluene	8.72	0.5	10		87	70	130			
1,3-Dichloropropane	8.75	1	10		88	70	130			
Dibromochloromethane	7.8	1	10		78	70	130			
1,2-Dibromoethane (EDB)	17.8	2	20		89	70	130			
Tetrachloroethene	8.68	1	10		87	70	130			
1,1,1,2-Tetrachloroethane	8.79	1	10		88	70	130			
Chlorobenzene	8.59	1	10		86	70	130			
Ethylbenzene	9.31	0.5	10		93	70	130			
m,p-Xylene	9.11	0.5	10		91	70	130			
Bromoform	7.75	1	10		78	70	130			
Styrene	7.81	1	10		78	70	130			
o-Xylene	9.07	0.5	10		91	70	130			
1,1,2,2-Tetrachloroethane	8.5	1	10		85	70	130			
1,2,3-Trichloropropane	18.3	2	20		92	70	130			
Isopropylbenzene	8.21	1	10		82	70	130			
Bromobenzene	8.55	1	10		86	70	130			
n-Propylbenzene	8.52	1	10		85	70	130			
4-Chlorotoluene	8.2	1	10		82	70	130			
2-Chlorotoluene	8.13	1	10		81	70	130			
1,3,5-Trimethylbenzene	8.75	1	10		88	70	130			
tert-Butylbenzene	8.47	1	10		85	70	130			
1,2,4-Trimethylbenzene	8.82	1	10		88	70	130			
sec-Butylbenzene	8.37	1	10		84	70	130			
1,3-Dichlorobenzene	8.83	1	10		88	70	130			
1,4-Dichlorobenzene	8.18	1	10		82	70	130			
4-Isopropyltoluene	8.73	1	10		87	70	130			
1,2-Dichlorobenzene	8.17	1	10		82	70	130			
n-Butylbenzene	8.91	1	10		89	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	43.6	3	50		87	67	130			
1,2,4-Trichlorobenzene	8	2	10		80	70	130			
Naphthalene	7.37	2	10		74	70	130			
Hexachlorobutadiene	18	2	20		90	70	130			
1,2,3-Trichlorobenzene	8.51	2	10		85	70	130			
Surr: 1,2-Dichloroethane-d4	10.8		10		108	70	130			



# Alpha Analytical, Inc.

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

**Date:**

12-Sep-11

## QC Summary Report

**Work Order:**

11083003

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Surr: Toluene-d8	9.51	10	95	70	130
Surr: 4-Bromofluorobenzene	9.15	10	92	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:  
12-Sep-11

## QC Summary Report

Work Order:  
11083003

### Sample Matrix Spike

File ID: 11090207.D

Type: MS

Test Code: EPA Method SW8260B

Batch ID: MS15W0902M

Analysis Date: 09/02/2011 10:44

Sample ID: 11083003-15AMS

Units: µg/L

Run ID: MSD\_15\_110902B

Prep Date: 09/02/2011 10:44

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	31.7	2.5	50	0	63	21	138			
Chloromethane	43	10	50	0	86	23	144			
Vinyl chloride	42.4	2.5	50	0	85	49	136			
Chloroethane	47.9	2.5	50	0	96	21	159			
Bromomethane	31.6	10	50	0	63	10	174			
Trichlorofluoromethane	53.2	2.5	50	0	106	32	154			
1,1-Dichloroethene	41	2.5	50	0	82	64	130			
Dichloromethane	41.3	10	50	0	83	69	130			
Freon-113	45.9	2.5	50	0	92	55	141			
trans-1,2-Dichloroethene	42.9	2.5	50	0	86	63	130			
Methyl tert-butyl ether (MTBE)	44.8	1.3	50	0	90	47	150			
1,1-Dichloroethane	43	2.5	50	0	86	66	130			
2-Butanone (MEK)	817	50	1000	0	82	23	182			
cis-1,2-Dichloroethene	42.1	2.5	50	0	84	70	130			
Bromochloromethane	45.4	2.5	50	0	91	70	132			
Chloroform	52.8	2.5	50	8.88	88	70	130			
2,2-Dichloropropane	43.1	2.5	50	0	86	38	154			
1,2-Dichloroethane	46.5	2.5	50	0	93	65	134			
1,1,1-Trichloroethane	44.5	2.5	50	0	89	65	136			
1,1-Dichloropropene	45.6	2.5	50	0	91	68	132			
Carbon tetrachloride	43.7	2.5	50	0	87	58	148			
Benzene	43.9	1.3	50	0	88	59	138			
Dibromomethane	45.5	2.5	50	0	91	70	130			
1,2-Dichloropropane	41.9	2.5	50	0	84	70	131			
Trichloroethene	42.9	2.5	50	0	86	65	144			
Bromodichloromethane	52.5	2.5	50	8	89	50	157			
4-Methyl-2-pentanone (MIBK)	117	13	125	0	93	20	182			
cis-1,3-Dichloropropene	40.2	2.5	50	0	80	63	131			
trans-1,3-Dichloropropene	38.5	2.5	50	0	77	65	136			
1,1,2-Trichloroethane	45	2.5	50	0	90	70	131			
Toluene	43	1.3	50	0	86	68	130			
1,3-Dichloropropane	42.2	2.5	50	0	84	70	130			
Dibromochloromethane	44.3	2.5	50	5.82	77	42	155			
1,2-Dibromoethane (EDB)	86.5	5	100	0	86	70	130			
Tetrachloroethene	42.8	2.5	50	0	86	65	130			
1,1,1,2-Tetrachloroethane	43	2.5	50	0	86	70	130			
Chlorobenzene	42.1	2.5	50	0	84	70	130			
Ethylbenzene	45.6	1.3	50	0	91	68	130			
m,p-Xylene	44.6	1.3	50	0	89	68	131			
Bromoform	40.7	2.5	50	2.62	76	65	143			
Styrene	38.1	2.5	50	0	76	59	153			
o-Xylene	44.2	1.3	50	0	88	70	130			
1,1,2,2-Tetrachloroethane	41.4	2.5	50	0	83	67	130			
1,2,3-Trichloropropane	89.4	10	100	0	89	70	130			
Isopropylbenzene	41	2.5	50	0	82	55	138			
Bromobenzene	42.6	2.5	50	0	85	70	130			
n-Propylbenzene	42.4	2.5	50	0	85	67	133			
4-Chlorotoluene	40.6	2.5	50	0	81	70	130			
2-Chlorotoluene	40.8	2.5	50	0	82	70	130			
1,3,5-Trimethylbenzene	44	2.5	50	0	88	67	134			
tert-Butylbenzene	42.4	2.5	50	0	85	55	147			
1,2,4-Trimethylbenzene	43.9	2.5	50	0	88	65	135			
sec-Butylbenzene	41.9	2.5	50	0	84	68	135			
1,3-Dichlorobenzene	44.5	2.5	50	0	89	70	130			
1,4-Dichlorobenzene	41	2.5	50	0	82	70	130			
4-Isopropyltoluene	43.8	2.5	50	0	88	68	132			
1,2-Dichlorobenzene	40.8	2.5	50	0	82	70	130			
n-Butylbenzene	45.5	2.5	50	0	91	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	215	15	250	0	86	64	130			
1,2,4-Trichlorobenzene	40.5	10	50	0	81	62	133			
Naphthalene	36.5	10	50	0	73	32	166			
Hexachlorobutadiene	92.6	10	100	0	93	63	130			
1,2,3-Trichlorobenzene	41.9	10	50	0	84	55	138			
Surr: 1,2-Dichloroethane-d4	53.5		50		107	70	130			
Surr: Toluene-d8	47.8		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:**

*12-Sep-11*

## QC Summary Report

**Work Order:**

11083003

Surr: 4-Bromofluorobenzene

46

50

92

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:

12-Sep-11

## QC Summary Report

Work Order:

11083003

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11090208.D

Batch ID: MS15W0902M

Analysis Date: 09/02/2011 11:05

Sample ID: 11083003-15AMSD

Units: µg/L

Run ID: MSD\_15\_110902B

Prep Date: 09/02/2011 11:05

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	33.8	2.5	50	0	68	21	138	31.74	6.4(33)	
Chloromethane	47.7	10	50	0	95	23	144	42.96	10.4(27)	
Vinyl chloride	43.8	2.5	50	0	88	49	136	42.39	3.3(21)	
Chloroethane	52.3	2.5	50	0	105	21	159	47.94	8.8(40)	
Bromomethane	38.4	10	50	0	77	10	174	31.6	19.4(40)	
Trichlorofluoromethane	54.8	2.5	50	0	110	32	154	53.19	3.0(37)	
1,1-Dichloroethene	42.9	2.5	50	0	86	64	130	41.02	4.6(21)	
Dichloromethane	42.8	10	50	0	86	69	130	41.25	3.8(20)	
Freon-113	48.3	2.5	50	0	97	55	141	45.94	5.1(40)	
trans-1,2-Dichloroethene	44.8	2.5	50	0	90	63	130	42.9	4.3(20)	
Methyl tert-butyl ether (MTBE)	47.5	1.3	50	0	95	47	150	44.81	5.9(40)	
1,1-Dichloroethane	45.1	2.5	50	0	90	66	130	42.97	4.9(20)	
2-Butanone (MEK)	860	50	1000	0	86	23	182	817.5	5.0(22)	
cis-1,2-Dichloroethene	45.5	2.5	50	0	91	70	130	42.05	7.9(20)	
Bromochloromethane	47.5	2.5	50	0	95	70	132	45.38	4.5(20)	
Chloroform	54.6	2.5	50	8.88	92	70	130	52.78	3.4(20)	
2,2-Dichloropropane	45.9	2.5	50	0	92	38	154	43.08	6.3(22)	
1,2-Dichloroethane	48.4	2.5	50	0	97	65	134	46.54	3.9(20)	
1,1,1-Trichloroethane	47.4	2.5	50	0	95	65	136	44.51	6.3(20)	
1,1-Dichloropropene	48.1	2.5	50	0	96	68	132	45.55	5.3(20)	
Carbon tetrachloride	46.5	2.5	50	0	93	58	148	43.66	6.2(20)	
Benzene	46.2	1.3	50	0	92	59	138	43.88	5.2(21)	
Dibromomethane	48.1	2.5	50	0	96	70	130	45.46	5.6(20)	
1,2-Dichloropropane	44.3	2.5	50	0	89	70	131	41.91	5.6(20)	
Trichloroethene	45.6	2.5	50	0	91	65	144	42.93	6.0(20)	
Bromodichloromethane	55.4	2.5	50	8	95	50	157	52.48	5.3(20)	
4-Methyl-2-pentanone (MIBK)	125	13	125	0	99.7	20	182	116.6	6.6(20)	
cis-1,3-Dichloropropene	43.1	2.5	50	0	86	63	131	40.21	7.0(20)	
trans-1,3-Dichloropropene	41.3	2.5	50	0	83	65	136	38.49	7.1(20)	
1,1,2-Trichloroethane	47.3	2.5	50	0	95	70	131	44.97	5.0(20)	
Toluene	44.8	1.3	50	0	90	68	130	43.01	4.1(20)	
1,3-Dichloropropane	44.5	2.5	50	0	89	70	130	42.16	5.5(20)	
Dibromochloromethane	46.5	2.5	50	5.82	81	42	155	44.29	4.8(20)	
1,2-Dibromoethane (EDB)	91.2	5	100	0	91	70	130	86.46	5.3(20)	
Tetrachloroethene	45	2.5	50	0	90	65	130	42.83	4.9(20)	
1,1,1,2-Tetrachloroethane	45.6	2.5	50	0	91	70	130	42.99	5.9(20)	
Chlorobenzene	44.2	2.5	50	0	88	70	130	42.1	4.8(20)	
Ethylbenzene	47.9	1.3	50	0	96	68	130	45.63	4.8(20)	
m,p-Xylene	46.8	1.3	50	0	94	68	131	44.61	4.8(20)	
Bromoform	43.7	2.5	50	2.62	82	65	143	40.66	7.3(20)	
Styrene	40.4	2.5	50	0	81	59	153	38.07	6.0(37)	
o-Xylene	47	1.3	50	0	94	70	130	44.21	6.0(20)	
1,1,2,2-Tetrachloroethane	43	2.5	50	0	86	67	130	41.39	3.8(20)	
1,2,3-Trichloropropane	93.1	10	100	0	93	70	130	89.4	4.1(20)	
Isopropylbenzene	43.3	2.5	50	0	87	55	138	41.01	5.4(20)	
Bromobenzene	45	2.5	50	0	90	70	130	42.58	5.4(20)	
n-Propylbenzene	44.9	2.5	50	0	90	67	133	42.35	5.9(30)	
4-Chlorotoluene	42.8	2.5	50	0	86	70	130	40.55	5.5(20)	
2-Chlorotoluene	42.8	2.5	50	0	86	70	130	40.79	4.8(20)	
1,3,5-Trimethylbenzene	46.3	2.5	50	0	93	67	134	44.02	5.1(21)	
tert-Butylbenzene	44.8	2.5	50	0	90	55	147	42.44	5.3(20)	
1,2,4-Trimethylbenzene	46.2	2.5	50	0	92	65	135	43.91	5.1(25)	
sec-Butylbenzene	44.5	2.5	50	0	89	68	135	41.9	6.0(20)	
1,3-Dichlorobenzene	46.7	2.5	50	0	93	70	130	44.49	4.8(20)	
1,4-Dichlorobenzene	43.2	2.5	50	0	86	70	130	41.04	5.2(20)	
4-Isopropyltoluene	46.2	2.5	50	0	92	68	132	43.78	5.4(20)	
1,2-Dichlorobenzene	42.9	2.5	50	0	86	70	130	40.76	5.1(20)	
n-Butylbenzene	47.8	2.5	50	0	96	62	134	45.52	5.0(21)	
1,2-Dibromo-3-chloropropane (DBCP)	225	15	250	0	90	64	130	214.7	4.7(20)	
1,2,4-Trichlorobenzene	42.5	10	50	0	85	62	133	40.47	5.0(29)	
Naphthalene	39	10	50	0	78	32	166	36.46	6.7(40)	
Hexachlorobutadiene	97.5	10	100	0	98	63	130	92.64	5.1(21)	
1,2,3-Trichlorobenzene	44.5	10	50	0	89	55	138	41.93	5.9(36)	
Surr: 1,2-Dichloroethane-d4	52.8		50		106	70	130			
Surr: Toluene-d8	47.5		50		95	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:**  
12-Sep-11

## QC Summary Report

**Work Order:**  
11083003

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Surr: 4-Bromofluorobenzene	45.9	50	92	70	130
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**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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

Billing Information :

**CHAIN-OF-CUSTODY RECORD**

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

**CA**  
 WorkOrder : BMIS11083003  
 Report Due By : 5:00 PM On : 13-Sep-2011

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

**Report Attention**      **Phone Number**      **Email Address**  
 David Corner      (619) 726-7311 x      cornerd@battelle.org  
 Betsy Cutie      (614) 424-4899 x      cutiee@battelle.org  
 Shane Walton      (614) 424-4117 x      waltonss@battelle.org

**Job :** 100006114/JPL Groundwater Monitoring  
**QC Level :** DSA = DOD QC Required : Final Rpt, MBLK, InitCal/Concal data, LCS, MS/MSD with Surrogates  
**Client's COC # :** 25571, 024297  
**COOLER TEMP :** 0 °C      **Samples Received :** 30-Aug-2011      **Date Printed :** 30-Aug-2011

Alpha Sample ID	Client Sample ID	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests			Sample Remarks	
						300_o_w	314_w	METALS_D W		
BM11083003-01A	MW-23-4	08/26/11 09:33	1	0	9					
BM11083003-02A	MW-23-3	08/26/11 09:55	5	0	9					
BM11083003-03A	MW-23-2	08/26/11 10:16	5	0	9					
BM11083003-04A	MW-23-1	08/26/11 10:43	5	0	9					Level IV QC
BM11083003-05A	EB-04/8/26/11	08/26/11 10:33	5	0	9					
BM11083003-06A	TB-04/8/26/11	08/26/11 08:00	1	0	9					Reno Trip Blank 4/6/11
BM11083003-07A	MW-24-4	08/29/11 09:58	1	0	9					Level IV QC
BM11083003-08A	MW-24-3	08/29/11 10:20	5	0	9					
BM11083003-09A	MW-24-2	08/29/11 10:45	5	0	9					
BM11083003-10A	MW-24-1	08/29/11 11:11	5	0	9					

**Comments:** Security seals intact. Frozen ice. Temp Blank #7848 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E. MS/MSD)...

**Logged in by:** Empfath Alcox      **Signature**      Elizabeth Alcox      **Print Name**      Alpha Analytical, Inc.      **Company**      8:30-11:11:33      **Date/Time**

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

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

# CA

**WorkOrder : BMIS11083003**  
**Report Due By : 5:00 PM On : 13-Sep-2011**

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

**Report Attention**    **Phone Number**    **Email Address**

David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@battelle.org
Shane Walton	(614) 424-4117 x	waltonss@battelle.org

EDD Required : Yes

Sampled by : Chase Brogdon, D. Loera

Client's COC # : 25571, 024297

Job : 100006114/JPL Groundwater Monitoring

Cooler Temp 0 °C

Samples Received 30-Aug-2011

Date Printed 30-Aug-2011

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

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	Requested Tests				Sample Remarks
				300_0_W	314_W	METALS_D W	VOC_TIC_W	
BMI11083003-11A	EB-05-8/29/11	AQ 08/29/11 10:59	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11083003-12A	TB-05-8/29/11	AQ 08/29/11 07:45	1 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 4/6/11
BMI11083003-13A	MW-6	AQ 08/29/11 09:49	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11083003-14A	DUPE-7-3Q11	AQ 08/29/11 09:55	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11083003-15A	MW-16	AQ 08/29/11 12:40	12 0 9	NO2, NO3, PO4, SO4, Cl	Cr	VOC by 524 Criteria	VOC by 524 Criteria	MS/MSD on all analyses except Anions.
BMI11083003-16A	MW-15	AQ 08/29/11 14:28	2 0 9	Cr	Cr			MS/MSD

Comments: Security seals intact. Frozen ice. Temp Blank #7848 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).

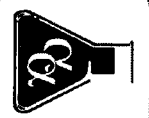
Logged in by: Elizabeth Adcox    Signature: [Signature]    Print Name: Elizabeth Adcox    Company: Alpha Analytical, Inc.    Date/Time: 8:35:11 11:33

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:**

Name BATTELLE / GERRILD TOMPKINS  
 Address 505 KINA 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  NV \_\_\_\_\_ WA \_\_\_\_\_  
 ID \_\_\_\_\_ OR \_\_\_\_\_ OTHER \_\_\_\_\_  
 Page # 1 of 1

Analyses Required

Client Name BATTELLE / DAVID CONNER PO. # 287215 Job # 100006114  
 Address 3990 OLD TOWN AVE. C-205 Email Address CONNERD@BATTELLE.ORG  
 City, State, Zip DAYTON OH 45424 Phone # (614) 726-7311 Fax # (614) 458-6614

Time Sampled	Date Sampled	Matrix See Key Below	Sampled by <u>CHASE BRIDSON</u>	Lab ID Number (Use Only)	Report Attention <u>DAVID CONNER</u>	TAT	Field Filled	Total and type of containers ** See below	VOC's (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	EDD / EDF? YES <input type="checkbox"/> NO <input type="checkbox"/>	Global ID #	REMARKS
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0933	8/26/11	AQ	BMT11083003-01		MW - 23 - 4			None	X	X	X			
0935					MW - 23 - 3			S-VARIOUS	X	X	X			
1016					MW - 23 - 2			S-VARIOUS	X	X	X			
1013					MW - 23 - 1			S-VARIOUS	X	X	X			LEVEL IV QC
1033		AQ			05 EB-04-8/26/11			3x Zp	X	X	X			Composites Bank
0500	8/26/11	AQ			06 TB-04-8/26/11			1x	X	X	X			Trap Bank

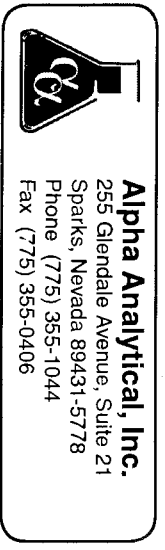
**ADDITIONAL INSTRUCTIONS:**

Relinquished by	Signature	Print Name	Company	Date	Time
Relinquished by	<i>[Signature]</i>	CHASE BRIDSON	INTEGRIS REC, INC	8/29/11	1500
Received by	<i>[Signature]</i>	Anthony Steer	Alpha Analytical	8/25/11	1500
Relinquished by	<i>[Signature]</i>	" "	" "	" "	15:00
Received by	<i>[Signature]</i>	Elizabeth Aldox	Alpha	8.30.11	11:33
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 BATTELLE / GERALD TOMPKINS  
 Address 505 KING AVE  
 City, State, Zip COLUMBUS OH 43201  
 Phone Number \_\_\_\_\_ Fax \_\_\_\_\_



**Samples Collected From Which State?**  
 AZ \_\_\_\_\_ CA  OR \_\_\_\_\_ NV \_\_\_\_\_ WA \_\_\_\_\_  
 ID \_\_\_\_\_

Analyses Required

Client Name BATTELLE / DAVID CONNER PO # 287215 Job # 100006114  
 Address 3990 OLD TOWN AVE. C-205 Email Address CONNER.D@BATTELLE.ORG  
 City, State, Zip DIEGO CA 92110 Phone # (619) 726-7311 Fax # (619) 458-6614

Time Sampled \_\_\_\_\_ Date Sampled \_\_\_\_\_ Matrix See Key Below \_\_\_\_\_  
 Sampled Below \_\_\_\_\_ Lab ID Number (Use Only) \_\_\_\_\_  
 Report Attention DAVID CONNER Sample Description \_\_\_\_\_  
 TAT \_\_\_\_\_ Field Filtered \_\_\_\_\_  
 Total and type of containers \*\* See below \_\_\_\_\_

Time Sampled	Date Sampled	Matrix See Key Below	Sampled Below	Lab ID Number (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	CHLORIDE, NITRATE, NITRITE, ORTHOPHOSPHATE SULFATE (360.0)	Level	REMARKS
0958	8/29/11	AQ				mw - 24-4	NDM		1 - poly	X	X	X		LEVEL IV RC	
1020	8/29/11	AQ				mw - 24-3			S-VARIOUS	X	X	X			
1045	8/29/11	AQ				mw - 24-2			S-VARIOUS	X	X	X			
1111	8/29/11	AQ				mw - 24-1			S-VARIOUS	X	X	X			
1059	8/29/11	AQ				EB-05-8/29/11			BV 2P	X	X	X			COMPONENT BLANK
0945	8/29/11	AQ				TRB-05-8/29/11			IV	X	X	X			TRAP BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHRIS BROOKER	JUSTICE SEC. INC.	8/29/11	1500
<i>[Signature]</i>	Anthony Stark	Alpha Analytical	8/29/11	1500
<i>[Signature]</i>	Elizabeth Aldox	Alpha	8-30-11	11:33

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Liter V-Voa S-Soil Jar O-Orho 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.

Required QC Level?  I  II  III  IV

EDD / EDF? YES \_\_\_\_\_ NO \_\_\_\_\_

Global ID # \_\_\_\_\_





# Alpha Analytical, Inc.

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

Date: 13-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11083104

Cooler Temp: 0°C

Alpha's Sample ID	Client's Sample ID	Matrix
11083104-01A	MW-3-4	Aqueous
11083104-02A	MW-3-3	Aqueous
11083104-03A	MW-3-2	Aqueous
11083104-04A	EB-06-8/30/11	Aqueous
11083104-05A	TB-06-8/30/11	Aqueous
11083104-06A	MW-4-3	Aqueous
11083104-07A	MW-4-2	Aqueous
11083104-08A	MW-4-1	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11083104-03A	EPA Method 314.0	Perchlorate
11083104-07A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/31/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-3-4 Lab ID: BMII1083104-01A Perchlorate Date Sampled 08/30/11 10:41	ND	1.00 µg/L	09/06/11 11:51	09/06/11 13:43
Client ID: MW-3-3 Lab ID: BMII1083104-02A Perchlorate Date Sampled 08/30/11 11:02	ND	1.00 µg/L	09/06/11 11:51	09/06/11 14:01
Client ID: MW-3-2 Lab ID: BMII1083104-03A Perchlorate Date Sampled 08/30/11 11:27	3.00	1.00 µg/L	09/06/11 11:51	09/06/11 14:20
Client ID: EB-06-8/30/11 Lab ID: BMII1083104-04A Perchlorate Date Sampled 08/30/11 10:55	ND	1.00 µg/L	09/06/11 11:51	09/06/11 14:38
Client ID: MW-4-3 Lab ID: BMII1083104-06A Perchlorate Date Sampled 08/30/11 08:43	ND	1.00 µg/L	09/06/11 11:51	09/06/11 14:57
Client ID: MW-4-2 Lab ID: BMII1083104-07A Perchlorate Date Sampled 08/30/11 09:07	17.6	1.00 µg/L	09/06/11 11:51	09/06/11 15:15
Client ID: MW-4-1 Lab ID: BMII1083104-08A Perchlorate Date Sampled 08/30/11 09:28	ND	1.00 µg/L	09/06/11 11:51	09/06/11 15:33

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  
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9/13/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 08/31/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-3-4				
Lab ID: BMII1083104-01A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:49
Date Sampled 08/30/11 10:41				
Client ID: MW-3-3				
Lab ID: BMII1083104-02A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:55
Date Sampled 08/30/11 11:02				
Client ID: MW-3-2				
Lab ID: BMII1083104-03A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:01
Date Sampled 08/30/11 11:27				
Client ID: EB-06-8/30/11				
Lab ID: BMII1083104-04A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:07
Date Sampled 08/30/11 10:55				
Client ID: MW-4-3				
Lab ID: BMII1083104-06A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:13
Date Sampled 08/30/11 08:43				
Client ID: MW-4-2				
Lab ID: BMII1083104-07A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:19
Date Sampled 08/30/11 09:07				
Client ID: MW-4-1				
Lab ID: BMII1083104-08A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:26
Date Sampled 08/30/11 09:28				

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  
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*e/*  
9/13/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-3-4</b> Lab ID: <b>BMI11083104-01A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 10:41	ND	2.0 µg/L	09/06/11 15:51	09/06/11 15:51
Client ID: <b>MW-3-3</b> Lab ID: <b>BMI11083104-02A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 11:02	ND	8.0 µg/L	09/06/11 16:12	09/06/11 16:12
Client ID: <b>MW-3-2</b> Lab ID: <b>BMI11083104-03A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 11:27	ND	2.0 µg/L	09/06/11 16:34	09/06/11 16:34
Client ID: <b>EB-06-8/30/11</b> Lab ID: <b>BMI11083104-04A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 10:55	ND	2.0 µg/L	09/06/11 12:36	09/06/11 12:36
Client ID: <b>TB-06-8/30/11</b> Lab ID: <b>BMI11083104-05A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 07:00	ND	2.0 µg/L	09/06/11 15:58	09/06/11 15:58
Client ID: <b>MW-4-3</b> Lab ID: <b>BMI11083104-06A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 08:43	ND	2.0 µg/L	09/06/11 16:55	09/06/11 16:55
Client ID: <b>MW-4-2</b> Lab ID: <b>BMI11083104-07A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 09:07	ND	2.0 µg/L	09/06/11 17:17	09/06/11 17:17
Client ID: <b>MW-4-1</b> Lab ID: <b>BMI11083104-08A</b> *** None Found *** Date Received: 08/31/11 Date Sampled: 08/30/11 09:28	ND	2.0 µg/L	09/06/11 17:39	09/06/11 17:39



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

---

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

*Roger Scholl*

*Randy Gardner*

*Walter Hinchman*

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*PS*

9/13/11

**Report Date**

Page 1 of 1





# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-01A  
Client I.D. Number: MW-3-4

Sampled: 08/30/11 10:41  
Received: 08/31/11  
Extracted: 09/06/11 15:51  
Analyzed: 09/06/11 15:51

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 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

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9/13/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-02A  
Client I.D. Number: MW-3-3

Sampled: 08/30/11 11:02  
Received: 08/31/11  
Extracted: 09/06/11 16:12  
Analyzed: 09/06/11 16:12

### Volatile Organics by GC/MS EPA Method SW8260B

Compound	Concentration	Reporting Limit	Compound	Concentration	Reporting Limit
1 Dichlorodifluoromethane	ND	2.0 µg/L	36 1,1,1,2-Tetrachloroethane	ND	2.0 µg/L
2 Chloromethane	ND	4.0 µg/L	37 Chlorobenzene	ND	2.0 µg/L
3 Vinyl chloride	ND	2.0 µg/L	38 Ethylbenzene	ND	2.0 µg/L
4 Chloroethane	ND	2.0 µg/L	39 m,p-Xylene	ND	2.0 µg/L
5 Bromomethane	ND	4.0 µg/L	40 Bromoform	ND	2.0 µg/L
6 Trichlorofluoromethane	ND	2.0 µg/L	41 Styrene	ND	2.0 µg/L
7 1,1-Dichloroethene	ND	2.0 µg/L	42 o-Xylene	ND	2.0 µg/L
8 Dichloromethane	ND	4.0 µg/L	43 1,1,2,2-Tetrachloroethane	ND	2.0 µg/L
9 Freon-113	ND	2.0 µg/L	44 1,2,3-Trichloropropane	ND	4.0 µg/L
10 trans-1,2-Dichloroethene	ND	2.0 µg/L	45 Isopropylbenzene	ND	2.0 µg/L
11 Methyl tert-butyl ether (MTBE)	ND	2.0 µg/L	46 Bromobenzene	ND	2.0 µg/L
12 1,1-Dichloroethane	ND	2.0 µg/L	47 n-Propylbenzene	ND	2.0 µg/L
13 2-Butanone (MEK)	ND	4.0 µg/L	48 4-Chlorotoluene	ND	2.0 µg/L
14 cis-1,2-Dichloroethene	ND	2.0 µg/L	49 2-Chlorotoluene	ND	2.0 µg/L
15 Bromochloromethane	ND	2.0 µg/L	50 1,3,5-Trimethylbenzene	ND	2.0 µg/L
16 Chloroform	ND	2.0 µg/L	51 tert-Butylbenzene	ND	2.0 µg/L
17 2,2-Dichloropropane	ND	2.0 µg/L	52 1,2,4-Trimethylbenzene	ND	2.0 µg/L
18 1,2-Dichloroethane	ND	2.0 µg/L	53 sec-Butylbenzene	ND	2.0 µg/L
19 1,1,1-Trichloroethane	ND	2.0 µg/L	54 1,3-Dichlorobenzene	ND	2.0 µg/L
20 1,1-Dichloropropene	ND	2.0 µg/L	55 1,4-Dichlorobenzene	ND	2.0 µg/L
21 Carbon tetrachloride	ND	2.0 µg/L	56 4-Isopropyltoluene	ND	2.0 µg/L
22 Benzene	ND	2.0 µg/L	57 1,2-Dichlorobenzene	ND	2.0 µg/L
23 Dibromomethane	ND	2.0 µg/L	58 n-Butylbenzene	ND	2.0 µg/L
24 1,2-Dichloropropane	ND	2.0 µg/L	59 1,2-Dibromo-3-chloropropane (DBCP)	ND	10 µg/L
25 Trichloroethene	ND	2.0 µg/L	60 1,2,4-Trichlorobenzene	ND	4.0 µg/L
26 Bromodichloromethane	ND	2.0 µg/L	61 Naphthalene	ND	4.0 µg/L
27 4-Methyl-2-pentanone (MIBK)	ND	10 µg/L	62 Hexachlorobutadiene	ND	4.0 µg/L
28 cis-1,3-Dichloropropene	ND	2.0 µg/L	63 1,2,3-Trichlorobenzene	ND	4.0 µg/L
29 trans-1,3-Dichloropropene	ND	2.0 µg/L	64 Surr: 1,2-Dichloroethane-d4	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	2.0 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	2.0 µg/L	66 Surr: 4-Bromofluorobenzene	87	(70-130) %REC
32 1,3-Dichloropropane	ND	2.0 µg/L			
33 Dibromochloromethane	ND	2.0 µg/L			
34 1,2-Dibromoethane (EDB)	ND	4.0 µg/L			
35 Tetrachloroethene	ND	2.0 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

Reporting Limits were increased due to sample foaming.

ND = Not Detected

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

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-03A  
Client I.D. Number: MW-3-2

Sampled: 08/30/11 11:27  
Received: 08/31/11  
Extracted: 09/06/11 16:34  
Analyzed: 09/06/11 16:34

### 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-Dichloroethane	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	1.0 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 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.

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9/13/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-04A  
Client I.D. Number: EB-06-8/30/11

Sampled: 08/30/11 10:55  
Received: 08/31/11  
Extracted: 09/06/11 12:36  
Analyzed: 09/06/11 12:36

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 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

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# 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

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

Job: 100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083104-05A  
Client I.D. Number: TB-06-8/30/11

Sampled: 08/30/11 07:00  
Received: 08/31/11  
Extracted: 09/06/11 12:58  
Analyzed: 09/06/11 12:58

### 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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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.

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*[Signature]*  
9/13/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-06A  
Client I.D. Number: MW-4-3

Sampled: 08/30/11 08:43  
Received: 08/31/11  
Extracted: 09/06/11 16:55  
Analyzed: 09/06/11 16:55

### 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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-07A  
Client I.D. Number: MW-4-2

Sampled: 08/30/11 09:07  
Received: 08/31/11  
Extracted: 09/06/11 17:17  
Analyzed: 09/06/11 17:17

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	97	(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	0.75	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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.

9/13/11

Report Date



# Alpha Analytical, Inc.

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

## VOC Sample Preservation Report

**Work Order:** BMI11083104

**Job:** 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11083104-01A	MW-3-4	Aqueous	2
11083104-02A	MW-3-3	Aqueous	2
11083104-03A	MW-3-2	Aqueous	6
11083104-04A	EB-06-8/30/11	Aqueous	2
11083104-05A	TB-06-8/30/11	Aqueous	2
11083104-06A	MW-4-3	Aqueous	2
11083104-07A	MW-4-2	Aqueous	2
11083104-08A	MW-4-1	Aqueous	2

9/13/11

**Report Date**

Page 1 of 1





# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11083104-08A  
Client I.D. Number: MW-4-1

Sampled: 08/30/11 09:28  
Received: 08/31/11  
Extracted: 09/06/11 17:39  
Analyzed: 09/06/11 17:39

### 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	107	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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.

This replaces the report signed 9/13/11 due to a change in the Surrogate Concentration for 4-Bromofluorobenzene, due to lab error.

ND = Not Detected

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) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

10/25/11

Report Date

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.



# Alpha Analytical, Inc.

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

Date:  
13-Sep-11

## QC Summary Report

Work Order:  
11083104

### Method Blank

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

File ID: **14**

Batch ID: **27248**

Analysis Date: **09/06/2011 12:48**

Sample ID: **MB-27248**

Units: **µg/L**

Run ID: **IC\_3\_110906A**

Prep Date: **09/06/2011 11:51**

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: **15**

Batch ID: **27248**

Analysis Date: **09/06/2011 13:06**

Sample ID: **LFB-27248**

Units: **µg/L**

Run ID: **IC\_3\_110906A**

Prep Date: **09/06/2011 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.4	2	25		98	85	115			

### Sample Matrix Spike

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

File ID: **34**

Batch ID: **27248**

Analysis Date: **09/06/2011 18:56**

Sample ID: **11090203-04ALFM**

Units: **µg/L**

Run ID: **IC\_3\_110906A**

Prep Date: **09/06/2011 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.8	2	25	1.821	88	80	120			

### Sample Matrix Spike Duplicate

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

File ID: **35**

Batch ID: **27248**

Analysis Date: **09/06/2011 19:14**

Sample ID: **11090203-04ALFMD**

Units: **µg/L**

Run ID: **IC\_3\_110906A**

Prep Date: **09/06/2011 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.2	2	25	1.821	89	80	120	23.78	1.6(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.



# Alpha Analytical, Inc.

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Date:  
13-Sep-11

## QC Summary Report

Work Order:  
11083104

### Method Blank

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

File ID: 090611.B\105\_M.D\

Batch ID: 27253

Analysis Date: 09/06/2011 22:56

Sample ID: MB-27253

Units : mg/L

Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

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: 090611.B\106\_M.D\

Batch ID: 27253

Analysis Date: 09/06/2011 23:02

Sample ID: LCS-27253

Units : mg/L

Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0502	0.005	0.05		100	85	115			

### Sample Matrix Spike

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

File ID: 090611.B\111\_M.D\

Batch ID: 27253

Analysis Date: 09/06/2011 23:32

Sample ID: 11083104-08AMS

Units : mg/L

Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0523	0.005	0.05	0	105	70	130			

### Sample Matrix Spike Duplicate

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

File ID: 090611.B\112\_M.D\

Batch ID: 27253

Analysis Date: 09/06/2011 23:37

Sample ID: 11083104-08AMSD

Units : mg/L

Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0507	0.005	0.05	0	101	70	130	0.05231	3.2(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:

13-Sep-11

## QC Summary Report

Work Order:

11083104

### Method Blank

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

File ID: **11090606.D**

Batch ID: **MS15W0906M**

Analysis Date: **09/06/2011 10:27**

Sample ID: **MBLK MS15W0906M**

Units : **µg/L**

Run ID: **MSD\_15\_110906A**

Prep Date: **09/06/2011 10:27**

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	10.5		10		105	70	130			
Surr: Toluene-d8	9.89		10		99	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:**

13-Sep-11

## QC Summary Report

**Work Order:**

11083104

Surr: 4-Bromofluorobenzene

8.76

10

88

70

130



# Alpha Analytical, Inc.

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Date:  
13-Sep-11

## QC Summary Report

Work Order:  
11083104

### Laboratory Control Spike

Type: LCS

Test Code: EPA Method SW8260B

File ID: 11090604.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 09:29

Sample ID: LCS MS15W0906M

Units: µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 09:29

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.53	1	10		85	70	130			
Chloromethane	11.2	2	10		112	70	130			
Vinyl chloride	10.3	1	10		103	70	130			
Chloroethane	11.9	1	10		119	70	130			
Bromomethane	7.6	2	10		76	70	130			
Trichlorofluoromethane	12.6	1	10		126	70	130			
1,1-Dichloroethene	9.62	1	10		96	70	130			
Dichloromethane	9.55	2	10		96	70	130			
Freon-113	10.6	1	10		106	70	137			
trans-1,2-Dichloroethene	9.97	1	10		99.7	70	130			
Methyl tert-butyl ether (MTBE)	10.1	0.5	10		101	70	130			
1,1-Dichloroethane	9.92	1	10		99	70	130			
2-Butanone (MEK)	262	10	200		131	70	130(130)			L51
cis-1,2-Dichloroethene	10	1	10		100	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.2	1	10		102	70	130			
2,2-Dichloropropane	10.2	1	10		102	70	130			
1,2-Dichloroethane	10.5	1	10		105	70	130			
1,1,1-Trichloroethane	10.4	1	10		104	70	130			
1,1-Dichloropropene	10.6	1	10		106	70	130			
Carbon tetrachloride	10.2	1	10		102	70	130			
Benzene	10.3	0.5	10		103	70	130			
Dibromomethane	10.5	1	10		105	70	130			
1,2-Dichloropropane	9.75	1	10		98	70	130			
Trichloroethene	10.2	1	10		102	70	130			
Bromodichloromethane	10.5	1	10		105	70	130			
4-Methyl-2-pentanone (MIBK)	28.8	2.5	25		115	20	182			
cis-1,3-Dichloropropene	10.1	1	10		101	70	130			
trans-1,3-Dichloropropene	9.39	1	10		94	70	130			
1,1,2-Trichloroethane	10.5	1	10		105	70	130			
Toluene	9.96	0.5	10		99.6	70	130			
1,3-Dichloropropane	9.73	1	10		97	70	130			
Dibromochloromethane	9.09	1	10		91	70	130			
1,2-Dibromoethane (EDB)	19.7	2	20		98	70	130			
Tetrachloroethene	9.97	1	10		99.7	70	130			
1,1,1,2-Tetrachloroethane	10.3	1	10		103	70	130			
Chlorobenzene	9.73	1	10		97	70	130			
Ethylbenzene	10.7	0.5	10		107	70	130			
m,p-Xylene	10.4	0.5	10		104	70	130			
Bromoform	9.2	1	10		92	70	130			
Styrene	8.86	1	10		89	70	130			
o-Xylene	10.4	0.5	10		104	70	130			
1,1,2,2-Tetrachloroethane	9.34	1	10		93	70	130			
1,2,3-Trichloropropane	20.1	2	20		101	70	130			
Isopropylbenzene	9.46	1	10		95	70	130			
Bromobenzene	9.76	1	10		98	70	130			
n-Propylbenzene	9.78	1	10		98	70	130			
4-Chlorotoluene	9.48	1	10		95	70	130			
2-Chlorotoluene	9.39	1	10		94	70	130			
1,3,5-Trimethylbenzene	10.1	1	10		101	70	130			
tert-Butylbenzene	9.79	1	10		98	70	130			
1,2,4-Trimethylbenzene	10.2	1	10		102	70	130			
sec-Butylbenzene	9.64	1	10		96	70	130			
1,3-Dichlorobenzene	10.3	1	10		103	70	130			
1,4-Dichlorobenzene	9.39	1	10		94	70	130			
4-Isopropyltoluene	10.1	1	10		101	70	130			
1,2-Dichlorobenzene	9.42	1	10		94	70	130			
n-Butylbenzene	10.5	1	10		105	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	49.1	3	50		98	67	130			
1,2,4-Trichlorobenzene	9.36	2	10		94	70	130			
Naphthalene	8.56	2	10		86	70	130			
Hexachlorobutadiene	21.3	2	20		106	70	130			
1,2,3-Trichlorobenzene	9.73	2	10		97	70	130			
Surr: 1,2-Dichloroethane-d4	10.5		10		105	70	130			
Surr: Toluene-d8	9.57		10		96	70	130			



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

Date:

13-Sep-11

## QC Summary Report

Work Order:

11083104

Surr: 4-Bromofluorobenzene

9.17

10

92

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:  
13-Sep-11

## QC Summary Report

Work Order:  
11083104

### Sample Matrix Spike

Type: MS

Test Code: EPA Method SW8260B

File ID: 11090607.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 10:48

Sample ID: 11090203-04AMS

Units: µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 10:48

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	34.6	2.5	50	0	69	21	138			
Chloromethane	48.5	10	50	0	97	23	144			
Vinyl chloride	51.1	2.5	50	0	102	49	136			
Chloroethane	53.4	2.5	50	0	107	21	159			
Bromomethane	37.6	10	50	0	75	10	174			
Trichlorofluoromethane	60	2.5	50	0	120	32	154			
1,1-Dichloroethene	44.4	2.5	50	0	89	64	130			
Dichloromethane	44	10	50	0	88	69	130			
Freon-113	50.6	2.5	50	0	101	55	141			
trans-1,2-Dichloroethene	45.6	2.5	50	0	91	63	130			
Methyl tert-butyl ether (MTBE)	48.6	1.3	50	0	97	47	150			
1,1-Dichloroethane	45.6	2.5	50	0	91	66	130			
2-Butanone (MEK)	893	50	1000	0	89	23	182			
cis-1,2-Dichloroethene	46.9	2.5	50	0	94	70	130			
Bromochloromethane	48.3	2.5	50	0	97	70	132			
Chloroform	50.8	2.5	50	2.66	96	70	130			
2,2-Dichloropropane	46.2	2.5	50	0	92	38	154			
1,2-Dichloroethane	50	2.5	50	0	100	65	134			
1,1,1-Trichloroethane	48	2.5	50	0	96	65	136			
1,1-Dichloropropene	48.9	2.5	50	0	98	68	132			
Carbon tetrachloride	48.1	2.5	50	0	96	58	148			
Benzene	47.5	1.3	50	0	95	59	138			
Dibromomethane	49.9	2.5	50	0	99.7	70	130			
1,2-Dichloropropane	45.7	2.5	50	0	91	70	131			
Trichloroethene	46.9	2.5	50	0	94	65	144			
Bromodichloromethane	48.8	2.5	50	0	98	50	157			
4-Methyl-2-pentanone (MIBK)	132	13	125	0	105	20	182			
cis-1,3-Dichloropropene	45	2.5	50	0	90	63	131			
trans-1,3-Dichloropropene	43.3	2.5	50	0	87	65	136			
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131			
Toluene	45.1	1.3	50	0	90	68	130			
1,3-Dichloropropane	45.5	2.5	50	0	91	70	130			
Dibromochloromethane	42.5	2.5	50	0	85	42	155			
1,2-Dibromoethane (EDB)	92.1	5	100	0	92	70	130			
Tetrachloroethene	48	2.5	50	2.17	92	65	130			
1,1,1,2-Tetrachloroethane	47	2.5	50	0	94	70	130			
Chlorobenzene	44.9	2.5	50	0	90	70	130			
Ethylbenzene	48.3	1.3	50	0	97	68	130			
m,p-Xylene	47.4	1.3	50	0	95	68	131			
Bromoform	43.2	2.5	50	0	86	65	143			
Styrene	40.7	2.5	50	0	81	59	153			
o-Xylene	47.1	1.3	50	0	94	70	130			
1,1,2,2-Tetrachloroethane	45.4	2.5	50	0	91	67	130			
1,2,3-Trichloropropane	96.8	10	100	0	97	70	130			
Isopropylbenzene	43.3	2.5	50	0	87	55	138			
Bromobenzene	45.3	2.5	50	0	91	70	130			
n-Propylbenzene	44.8	2.5	50	0	90	67	133			
4-Chlorotoluene	43.5	2.5	50	0	87	70	130			
2-Chlorotoluene	42.9	2.5	50	0	86	70	130			
1,3,5-Trimethylbenzene	46.6	2.5	50	0	93	67	134			
tert-Butylbenzene	45.1	2.5	50	0	90	55	147			
1,2,4-Trimethylbenzene	46.4	2.5	50	0	93	65	135			
sec-Butylbenzene	44.7	2.5	50	0	89	68	135			
1,3-Dichlorobenzene	47.2	2.5	50	0	94	70	130			
1,4-Dichlorobenzene	43.6	2.5	50	0	87	70	130			
4-Isopropyltoluene	46.6	2.5	50	0	93	68	132			
1,2-Dichlorobenzene	43.6	2.5	50	0	87	70	130			
n-Butylbenzene	48	2.5	50	0	96	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	234	15	250	0	94	64	130			
1,2,4-Trichlorobenzene	43.4	10	50	0	87	62	133			
Naphthalene	39.9	10	50	0	80	32	166			
Hexachlorobutadiene	99	10	100	0	99	63	130			
1,2,3-Trichlorobenzene	45.2	10	50	0	90	55	138			
Surr: 1,2-Dichloroethane-d4	54.4		50		109	70	130			
Surr: Toluene-d8	47.2		50		94	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:

13-Sep-11

## QC Summary Report

Work Order:

11083104

Surr: 4-Bromofluorobenzene

46.2

50

92

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:  
13-Sep-11

## QC Summary Report

Work Order:  
11083104

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11090608.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 11:10

Sample ID: 11090203-04AMSD

Units: µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 11:10

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	35.3	2.5	50	0	71	21	138	34.57	2.2(33)	
Chloromethane	49.1	10	50	0	98	23	144	48.53	1.2(27)	
Vinyl chloride	54	2.5	50	0	108	49	136	51.13	5.4(21)	
Chloroethane	56.7	2.5	50	0	113	21	159	53.38	6.0(40)	
Bromomethane	42.4	10	50	0	85	10	174	37.64	12.0(40)	
Trichlorofluoromethane	61.4	2.5	50	0	123	32	154	59.95	2.5(37)	
1,1-Dichloroethene	46.2	2.5	50	0	92	64	130	44.35	4.1(21)	
Dichloromethane	45.6	10	50	0	91	69	130	44	3.5(20)	
Freon-113	51.4	2.5	50	0	103	55	141	50.58	1.6(40)	
trans-1,2-Dichloroethene	47.9	2.5	50	0	96	63	130	45.58	5.0(20)	
Methyl tert-butyl ether (MTBE)	50.3	1.3	50	0	101	47	150	48.56	3.5(40)	
1,1-Dichloroethane	48	2.5	50	0	96	66	130	45.61	5.2(20)	
2-Butanone (MEK)	881	50	1000	0	88	23	182	893.5	1.4(22)	
cis-1,2-Dichloroethene	48.7	2.5	50	0	97	70	130	46.91	3.8(20)	
Bromochloromethane	50.2	2.5	50	0	100	70	132	48.28	3.9(20)	
Chloroform	53	2.5	50	2.66	101	70	130	50.79	4.2(20)	
2,2-Dichloropropane	48.8	2.5	50	0	98	38	154	46.19	5.5(22)	
1,2-Dichloroethane	51.1	2.5	50	0	102	65	134	49.98	2.2(20)	
1,1,1-Trichloroethane	50.6	2.5	50	0	101	65	136	48.03	5.1(20)	
1,1-Dichloropropene	50.9	2.5	50	0	102	68	132	48.92	3.9(20)	
Carbon tetrachloride	50.5	2.5	50	0	101	58	148	48.08	4.8(20)	
Benzene	49	1.3	50	0	98	59	138	47.52	3.0(21)	
Dibromomethane	49.9	2.5	50	0	99.9	70	130	49.86	0.2(20)	
1,2-Dichloropropane	47	2.5	50	0	94	70	131	45.7	2.7(20)	
Trichloroethene	48.4	2.5	50	0	97	65	144	46.93	3.1(20)	
Bromodichloromethane	49.8	2.5	50	0	99.7	50	157	48.78	2.1(20)	
4-Methyl-2-pentanone (MIBK)	128	13	125	0	102	20	182	131.6	2.7(20)	
cis-1,3-Dichloropropene	45.9	2.5	50	0	92	63	131	44.96	2.1(20)	
trans-1,3-Dichloropropene	43.8	2.5	50	0	88	65	136	43.31	1.1(20)	
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131	49.17	0.1(20)	
Toluene	47.6	1.3	50	0	95	68	130	45.14	5.3(20)	
1,3-Dichloropropane	46.6	2.5	50	0	93	70	130	45.46	2.4(20)	
Dibromochloromethane	44.1	2.5	50	0	88	42	155	42.48	3.6(20)	
1,2-Dibromoethane (EDB)	95.2	5	100	0	95	70	130	92.13	3.3(20)	
Tetrachloroethene	50.5	2.5	50	2.17	97	65	130	48.04	5.0(20)	
1,1,1,2-Tetrachloroethane	49	2.5	50	0	98	70	130	46.97	4.2(20)	
Chlorobenzene	46.2	2.5	50	0	92	70	130	44.87	3.0(20)	
Ethylbenzene	50.6	1.3	50	0	101	68	130	48.32	4.7(20)	
m,p-Xylene	49.1	1.3	50	0	98	68	131	47.38	3.5(20)	
Bromoform	43.9	2.5	50	0	88	65	143	43.24	1.6(20)	
Styrene	42.4	2.5	50	0	85	59	153	40.73	3.9(37)	
o-Xylene	49.2	1.3	50	0	98	70	130	47.08	4.5(20)	
1,1,2,2-Tetrachloroethane	45.4	2.5	50	0	91	67	130	45.42	0.1(20)	
1,2,3-Trichloropropane	96.7	10	100	0	97	70	130	96.75	0.1(20)	
Isopropylbenzene	45.3	2.5	50	0	91	55	138	43.34	4.4(20)	
Bromobenzene	47.3	2.5	50	0	95	70	130	45.25	4.5(20)	
n-Propylbenzene	47	2.5	50	0	94	67	133	44.76	4.9(30)	
4-Chlorotoluene	45.3	2.5	50	0	91	70	130	43.54	4.0(20)	
2-Chlorotoluene	44.9	2.5	50	0	90	70	130	42.89	4.7(20)	
1,3,5-Trimethylbenzene	48.4	2.5	50	0	97	67	134	46.61	3.7(21)	
tert-Butylbenzene	47.1	2.5	50	0	94	55	147	45.05	4.5(20)	
1,2,4-Trimethylbenzene	48.3	2.5	50	0	97	65	135	46.37	4.1(25)	
sec-Butylbenzene	46.6	2.5	50	0	93	68	135	44.7	4.1(20)	
1,3-Dichlorobenzene	49.3	2.5	50	0	99	70	130	47.2	4.4(20)	
1,4-Dichlorobenzene	45.1	2.5	50	0	90	70	130	43.55	3.4(20)	
4-Isopropyltoluene	48.5	2.5	50	0	97	68	132	46.6	4.0(20)	
1,2-Dichlorobenzene	45.1	2.5	50	0	90	70	130	43.59	3.3(20)	
n-Butylbenzene	50.4	2.5	50	0	101	62	134	48.03	4.7(21)	
1,2-Dibromo-3-chloropropane (DBCP)	242	15	250	0	97	64	130	234	3.2(20)	
1,2,4-Trichlorobenzene	47.1	10	50	0	94	62	133	43.43	8.2(29)	
Naphthalene	43.8	10	50	0	88	32	166	39.91	9.2(40)	
Hexachlorobutadiene	108	10	100	0	108	63	130	99.01	8.6(21)	
1,2,3-Trichlorobenzene	49.8	10	50	0	99.5	55	138	45.24	9.5(36)	
Surr: 1,2-Dichloroethane-d4	53.1		50		106	70	130			
Surr: Toluene-d8	48.2		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:**

13-Sep-11

## QC Summary Report

**Work Order:**

11083104

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Surr: 4-Bromofluorobenzene	45.7	50	91	70	130
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**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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L51 = Analyte recovery was above acceptance limits for the LCS, but was acceptable in the MS/MSD.

**Billing Information :**

**CHAIN-OF-CUSTODY RECORD**

**Alpha Analytical, Inc.**

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

**CA**

**WorkOrder : BMIS11083104**  
**Report Due By : 5:00 PM On : 14-Sep-2011**

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

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

EDD Required : Yes

Sampled by : Chase Brogdon

Client's COC # : 25569, 25568    Job : 100006114/JPL Groundwater Monitoring    Cooler Temp    Samples Received    Date Printed  
 0 °C    31-Aug-2011    31-Aug-2011

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

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	Requested Tests			Sample Remarks
				314_W	METALS_D W	VOC_TIC_W	
BM111083104-01A	MW-3-4	AQ 08/30/11 10:41	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-02A	MW-3-3	AQ 08/30/11 11:02	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-03A	MW-3-2	AQ 08/30/11 11:27	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-04A	EB-06-8/30/11	AQ 08/30/11 10:55	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-05A	TB-06-8/30/11	AQ 08/30/11 07:00	1 0 9	Perchlorate	Cr	VOC by 524 Criteria	Reno Trip Blank 6/22/11
BM111083104-06A	MW-4-3	AQ 08/30/11 08:43	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-07A	MW-4-2	AQ 08/30/11 09:07	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	
BM111083104-08A	MW-4-1	AQ 08/30/11 09:28	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	Level IV QC

**Comments:** Security seals intact. Frozen ice. Temp Blank #8743 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).

Signature: *Elizabeth Adcox*    Print Name: Elizabeth Adcox    Date/Time: 8:31 1157  
 Company: Alpha Analytical, Inc.

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:**

Name BATTELLE / GERALD TOMPKINS  
 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?** 25569  
 AZ  CA  NV  WA   
 ID  OR  OTHER   
 Page # 1 of 1

Analyses Required

Required QC Level?  
 I II III IV  
 (III)

EDD/EDF? YES  NO

REMARKS

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by	Lab ID Number (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and Type of containers ** See below	VOC'S (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	REMARKS
1041	8/30/11	AR	BMT11083104-01		MW - 3 - 4	NORM			5 VIALS	X	X	X	
102					MW - 3 - 3				5 VIALS	X	X	X	
1122					MW - 3 - 2				5 VIALS	X	X	X	
1055	8/30/11	AR			53-06-8/30/11				3V 2P	X	X	X	EQUIPMENT'S BLANK
0700	8/30/11	AR			05TB-06-8/30/11				1V	X			TRIP BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHRISTOPHER		8/30/11	1430
<i>[Signature]</i>	Anthony Star	Alpha Analytical	8/30/11	1415
<i>[Signature]</i>	Elizabeth Alder	Alpha	8.31.11	1157

\*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 BARTELLE / GERRARD TOMPKINS  
Address 508 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  NV \_\_\_\_\_ WA \_\_\_\_\_

Page # 1 of 1

Analyses Required

Client Name BARTELLE / DAVID CONNER PO # 287215 Job # 100006114  
 Address 3990 OLD TOWN AVE. C-205 Email Address CONNER.D @ BARTELLE.ORG  
 City, State, Zip San DIEGO, CA 92110 Phone # (619) 726-7311 Fax # (619) 458-6614  
 Time Sampled \_\_\_\_\_ Date Sampled 8/30/11 Matrix\* AO Sampled by \_\_\_\_\_ Lab ID Number \_\_\_\_\_ Office (Use Only) \_\_\_\_\_ Report Attention \_\_\_\_\_ Sample Description \_\_\_\_\_ TAT \_\_\_\_\_ Field Filled \_\_\_\_\_ Total and type of containers \*\* See below  
 Global ID # \_\_\_\_\_ REMARKS \_\_\_\_\_  
 Required QC Level? I II  III IV  
 EDP/EDF? YES  NO \_\_\_\_\_

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by	Lab ID Number	Office (Use Only)	Report Attention	Sample Description	TAT	Field Filled	Total and type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	REMARKS
	<u>8/30/11</u>	<u>AO</u>					<u>mw - 4 - 3</u>			<u>VARIOUS</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>LEVEL IV OC</u>
	<u>8/30/11</u>	<u>AO</u>					<u>mw - 4 - 2</u>			<u>VARIOUS</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>LEVEL IV OC</u>
	<u>8/30/11</u>	<u>AO</u>					<u>mw - 4 - 1</u>			<u>VARIOUS</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>LEVEL IV OC</u>

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
	<u>Elizabeth Aldcox</u>	<u>Alpha Analytical</u>	<u>8/30/11</u>	<u>1400</u>
	<u>Anthony Stark</u>	<u>Alpha Analytical</u>	<u>8/30/11</u>	<u>1415</u>
	<u>Elizabeth Aldcox</u>	<u>Alpha Analytical</u>	<u>8/31/11</u>	<u>1157</u>

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Liter V-Vial 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.



# Alpha Analytical, Inc.

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

Date: 15-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11090105

Cooler Temp: 0 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11090105-01A	MW-22-3	Aqueous
11090105-02A	MW-22-2	Aqueous
11090105-03A	MW-22-1	Aqueous
11090105-04A	EB-07-08/31/11	Aqueous
11090105-05A	TB-07-08/31/11	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11090105-01A	EPA Method 314.0	Perchlorate
11090105-02A	EPA Method 314.0	Perchlorate
11090105-03A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/01/11

Job: 100006114/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography  
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-22-3</b> Lab ID: BMI11090105-01A Perchlorate Date Sampled 08/31/11 08:53	2.72	1.00 µg/L	09/06/11 11:51	09/06/11 15:52
Client ID: <b>MW-22-2</b> Lab ID: BMI11090105-02A Perchlorate Date Sampled 08/31/11 09:16	1.97	1.00 µg/L	09/06/11 11:51	09/06/11 20:10
Client ID: <b>MW-22-1</b> Lab ID: BMI11090105-03A Perchlorate Date Sampled 08/31/11 09:41	98.7	5.00 µg/L	09/06/11 11:51	09/06/11 20:28
Client ID: <b>EB-07-08/31/11</b> Lab ID: BMI11090105-04A Perchlorate Date Sampled 08/31/11 09:32	ND	1.00 µg/L	09/06/11 11:51	09/06/11 17:24

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.

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**9/15/11**

**Report Date**





# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/01/11

Job: 100006114/JPL Groundwater Monitoring

### Metals by ICPMS EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-22-3</b> Lab ID : BMII1090105-01A Chromium (Cr) Date Sampled 08/31/11 08:53	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:02
Client ID: <b>MW-22-2</b> Lab ID : BMII1090105-02A Chromium (Cr) Date Sampled 08/31/11 09:16	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:08
Client ID: <b>MW-22-1</b> Lab ID : BMII1090105-03A Chromium (Cr) Date Sampled 08/31/11 09:41	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:14
Client ID: <b>EB-07-08/31/11</b> Lab ID : BMII1090105-04A Chromium (Cr) Date Sampled 08/31/11 09:32	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:20

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  
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**Report Date**



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-22-3</b> Lab ID : BMII1090105-01A Date Received : 09/01/11 Date Sampled : 08/31/11 08:53	*** None Found ***	ND	2.0 µg/L	09/07/11 13:33 09/07/11 13:33
Client ID : <b>MW-22-2</b> Lab ID : BMII1090105-02A Date Received : 09/01/11 Date Sampled : 08/31/11 09:16	*** None Found ***	ND	2.0 µg/L	09/07/11 15:43 09/07/11 15:43
Client ID : <b>MW-22-1</b> Lab ID : BMII1090105-03A Date Received : 09/01/11 Date Sampled : 08/31/11 09:41	*** None Found ***	ND	2.0 µg/L	09/07/11 16:05 09/07/11 16:05
Client ID : <b>EB-07-08/31/11</b> Lab ID : BMII1090105-04A Date Received : 09/01/11 Date Sampled : 08/31/11 09:32	*** None Found ***	ND	2.0 µg/L	09/07/11 12:07 09/07/11 12:07
Client ID : <b>TB-07-08/31/11</b> Lab ID : BMII1090105-05A Date Received : 09/01/11 Date Sampled : 08/31/11 07:30	*** None Found ***	ND	2.0 µg/L	09/07/11 12:28 09/07/11 12:28

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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9/16/11

**Report Date**

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 10006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090105-01A  
Client I.D. Number: MW-22-3

Sampled: 08/31/11 08:53  
Received: 09/01/11  
Extracted: 09/07/11 13:33  
Analyzed: 09/07/11 13:33

### 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-Dichloroethane	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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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.

J=Estimated: The analyte was positively identified; the quantitation is an estimation.

ND = Not Detected

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

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9/16/11

Report Date

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# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090105-02A  
Client I.D. Number: MW-22-2

Sampled: 08/31/11 09:16  
Received: 09/01/11  
Extracted: 09/07/11 15:43  
Analyzed: 09/07/11 15:43

### 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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/16/11

Report Date

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090105-03A  
Client I.D. Number: MW-22-1

Sampled: 08/31/11 09:41  
Received: 09/01/11  
Extracted: 09/07/11 16:05  
Analyzed: 09/07/11 16:05

### 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	3.8	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	1.7	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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(70-130) %REC
32 1,3-Dichloropropane	ND	0.50 µg/L			
33 Dibromochloromethane	0.89	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

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Report Date

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090105-04A  
Client I.D. Number: EB-07-08/31/11

Sampled: 08/31/11 09:32  
Received: 09/01/11  
Extracted: 09/07/11 12:07  
Analyzed: 09/07/11 12:07

### 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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 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.

9/16/11

Report Date

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.



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090105-05A  
Client I.D. Number: TB-07-08/31/11

Sampled: 08/31/11 07:30  
Received: 09/01/11  
Extracted: 09/07/11 12:28  
Analyzed: 09/07/11 12:28

### 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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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

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9/16/11

Report Date

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.

Page 1 of 1



# Alpha Analytical, Inc.

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---

## VOC Sample Preservation Report

**Work Order:** BMI11090105

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11090105-01A	MW-22-3	Aqueous	2
11090105-02A	MW-22-2	Aqueous	2
11090105-03A	MW-22-1	Aqueous	2
11090105-04A	EB-07-08/31/11	Aqueous	2
11090105-05A	TB-07-08/31/11	Aqueous	2

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**9/16/11**  
**Report Date**

*Page 1 of 1*





# Alpha Analytical, Inc.

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

Date:  
13-Sep-11

## QC Summary Report

Work Order:  
11090105

### Method Blank

File ID: 14	Type: <b>MBLK</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27248</b>	Analysis Date: <b>09/06/2011 12:48</b>						
Sample ID: <b>MB-27248</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110906A</b>	Prep Date: <b>09/06/2011 11:51</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND		1							

### Laboratory Fortified Blank

File ID: 15	Type: <b>LFB</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27248</b>	Analysis Date: <b>09/06/2011 13:06</b>						
Sample ID: <b>LFB-27248</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110906A</b>	Prep Date: <b>09/06/2011 11:51</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.4	2	25		98	85	115			

### Sample Matrix Spike

File ID: 34	Type: <b>LFM</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27248</b>	Analysis Date: <b>09/06/2011 18:56</b>						
Sample ID: <b>11090203-04ALFM</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110906A</b>	Prep Date: <b>09/06/2011 11:51</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.8	2	25	1.821	88	80	120			

### Sample Matrix Spike Duplicate

File ID: 35	Type: <b>LFMD</b>	Test Code: <b>EPA Method 314.0</b>	Batch ID: <b>27248</b>	Analysis Date: <b>09/06/2011 19:14</b>						
Sample ID: <b>11090203-04ALFMD</b>	Units : <b>µg/L</b>	Run ID: <b>IC_3_110906A</b>	Prep Date: <b>09/06/2011 11:51</b>							
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.2	2	25	1.821	89	80	120	23.78	1.6(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:  
15-Sep-11

## QC Summary Report

Work Order:  
11090105

### Method Blank

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

File ID: **090611.B\070\_M.D\**

Batch ID: **27242**

Analysis Date: **09/06/2011 19:29**

Sample ID: **MB-27242**

Units : **mg/L**

Run ID: **ICP/MS\_110906D**

Prep Date: **09/02/2011 18:05**

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: **090611.B\071\_M.D\**

Batch ID: **27242**

Analysis Date: **09/06/2011 19:35**

Sample ID: **LCS-27242**

Units : **mg/L**

Run ID: **ICP/MS\_110906D**

Prep Date: **09/02/2011 18:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0512	0.005	0.05		102	85	115			

### Sample Matrix Spike

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

File ID: **090611.B\076\_M.D\**

Batch ID: **27242**

Analysis Date: **09/06/2011 20:04**

Sample ID: **11083003-04AMS**

Units : **mg/L**

Run ID: **ICP/MS\_110906D**

Prep Date: **09/02/2011 18:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0563	0.005	0.05	0.007226	98	70	130			

### Sample Matrix Spike Duplicate

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

File ID: **090611.B\077\_M.D\**

Batch ID: **27242**

Analysis Date: **09/06/2011 20:10**

Sample ID: **11083003-04AMSD**

Units : **mg/L**

Run ID: **ICP/MS\_110906D**

Prep Date: **09/02/2011 18:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0559	0.005	0.05	0.007226	97	70	130	0.05627	0.7(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:  
16-Sep-11

## QC Summary Report

Work Order:  
11090105

### Method Blank

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

File ID: **11090706.D**

Batch ID: **MS15W0907M**

Analysis Date: **09/07/2011 10:41**

Sample ID: **MBLK MS15W0907M**

Units: **µg/L**

Run ID: **MSD\_15\_110907B**

Prep Date: **09/07/2011 10:41**

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	10.4		10		104	70	130			
Surr: Toluene-d8	9.82		10		98	70	130			



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**Date:**

*16-Sep-11*

## QC Summary Report

**Work Order:**

11090105

Surr: 4-Bromofluorobenzene

9.09

10

91

70

130



# Alpha Analytical, Inc.

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Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090105

### Laboratory Control Spike

Type: LCS

Test Code: EPA Method SW8260B

File ID: 11090704.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 09:46

Sample ID: LCS MS15W0907M

Units: µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 09:46

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	7.21	1	10		72	70	130			
Chloromethane	10.1	2	10		101	70	130			
Vinyl chloride	9.44	1	10		94	70	130			
Chloroethane	11.7	1	10		117	70	130			
Bromomethane	7.52	2	10		75	70	130			
Trichlorofluoromethane	12.6	1	10		126	70	130			
1,1-Dichloroethene	9.35	1	10		94	70	130			
Dichloromethane	9.14	2	10		91	70	130			
Freon-113	10.2	1	10		102	70	137			
trans-1,2-Dichloroethene	9.67	1	10		97	70	130			
Methyl tert-butyl ether (MTBE)	9.55	0.5	10		96	70	130			
1,1-Dichloroethane	9.57	1	10		96	70	130			
2-Butanone (MEK)	235	10	200		118	70	130			
cis-1,2-Dichloroethene	9.74	1	10		97	70	130			
Bromochloromethane	9.99	1	10		99.9	70	130			
Chloroform	9.96	1	10		99.6	70	130			
2,2-Dichloropropane	9.63	1	10		96	70	130			
1,2-Dichloroethane	10.3	1	10		103	70	130			
1,1,1-Trichloroethane	10.1	1	10		101	70	130			
1,1-Dichloropropene	10.3	1	10		103	70	130			
Carbon tetrachloride	9.76	1	10		98	70	130			
Benzene	9.99	0.5	10		99.9	70	130			
Dibromomethane	10.2	1	10		102	70	130			
1,2-Dichloropropane	9.63	1	10		96	70	130			
Trichloroethene	9.91	1	10		99	70	130			
Bromodichloromethane	10.1	1	10		101	70	130			
4-Methyl-2-pentanone (MIBK)	26.6	2.5	25		106	20	182			
cis-1,3-Dichloropropene	9.71	1	10		97	70	130			
trans-1,3-Dichloropropene	9.1	1	10		91	70	130			
1,1,2-Trichloroethane	10.4	1	10		104	70	130			
Toluene	9.91	0.5	10		99	70	130			
1,3-Dichloropropane	9.67	1	10		97	70	130			
Dibromochloromethane	8.87	1	10		89	70	130			
1,2-Dibromoethane (EDB)	19.8	2	20		99	70	130			
Tetrachloroethene	9.93	1	10		99	70	130			
1,1,1,2-Tetrachloroethane	10.2	1	10		102	70	130			
Chlorobenzene	9.8	1	10		98	70	130			
Ethylbenzene	10.7	0.5	10		107	70	130			
m,p-Xylene	10.5	0.5	10		105	70	130			
Bromoform	8.87	1	10		89	70	130			
Styrene	8.91	1	10		89	70	130			
o-Xylene	10.4	0.5	10		104	70	130			
1,1,1,2,2-Tetrachloroethane	9.34	1	10		93	70	130			
1,2,3-Trichloropropane	20.1	2	20		100	70	130			
Isopropylbenzene	9.43	1	10		94	70	130			
Bromobenzene	9.66	1	10		97	70	130			
n-Propylbenzene	9.73	1	10		97	70	130			
4-Chlorotoluene	9.38	1	10		94	70	130			
2-Chlorotoluene	9.35	1	10		94	70	130			
1,3,5-Trimethylbenzene	9.99	1	10		99.9	70	130			
tert-Butylbenzene	9.69	1	10		97	70	130			
1,2,4-Trimethylbenzene	10	1	10		100	70	130			
sec-Butylbenzene	9.58	1	10		96	70	130			
1,3-Dichlorobenzene	10.1	1	10		101	70	130			
1,4-Dichlorobenzene	9.38	1	10		94	70	130			
4-Isopropyltoluene	10	1	10		100	70	130			
1,2-Dichlorobenzene	9.23	1	10		92	70	130			
n-Butylbenzene	10.3	1	10		103	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	47	3	50		94	67	130			
1,2,4-Trichlorobenzene	8.89	2	10		89	70	130			
Naphthalene	7.8	2	10		78	70	130			
Hexachlorobutadiene	20.5	2	20		103	70	130			
1,2,3-Trichlorobenzene	8.97	2	10		90	70	130			
Surr: 1,2-Dichloroethane-d4	10.3		10		103	70	130			
Surr: Toluene-d8	9.67		10		97	70	130			



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

**Date:**

16-Sep-11

## QC Summary Report

**Work Order:**

11090105

Surr: 4-Bromofluorobenzene

9.06

10

91

70

130



# Alpha Analytical, Inc.

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

Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090105

### Sample Matrix Spike

Type: MS Test Code: EPA Method SW8260B

File ID: 11090707.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 11:02

Sample ID: 11090105-01AMS

Units : µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 11:02

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	43.9	2.5	50	0	88	21	138			
Chloromethane	57.2	10	50	0	114	23	144			
Vinyl chloride	58.5	2.5	50	0	117	49	136			
Chloroethane	56.9	2.5	50	0	114	21	159			
Bromomethane	46	10	50	0	92	10	174			
Trichlorofluoromethane	65	2.5	50	0	130	32	154			
1,1-Dichloroethene	46.5	2.5	50	0	93	64	130			
Dichloromethane	44.9	10	50	0	90	69	130			
Freon-113	52.6	2.5	50	0	105	55	141			
trans-1,2-Dichloroethene	47.3	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	45.9	1.3	50	0	92	47	150			
1,1-Dichloroethane	47.1	2.5	50	0	94	66	130			
2-Butanone (MEK)	852	50	1000	0	85	23	182			
cis-1,2-Dichloroethene	47.7	2.5	50	0	95	70	130			
Bromochloromethane	49.1	2.5	50	0	98	70	132			
Chloroform	49.1	2.5	50	0	98	70	130			
2,2-Dichloropropane	47.9	2.5	50	0	96	38	154			
1,2-Dichloroethane	49.6	2.5	50	0	99	65	134			
1,1,1-Trichloroethane	49.2	2.5	50	0	98	65	136			
1,1-Dichloropropene	50.6	2.5	50	0	101	68	132			
Carbon tetrachloride	49.3	2.5	50	0	99	58	148			
Benzene	49.1	1.3	50	0	98	59	138			
Dibromomethane	49.2	2.5	50	0	98	70	130			
1,2-Dichloropropane	46.8	2.5	50	0	94	70	131			
Trichloroethene	48.7	2.5	50	0	97	65	144			
Bromodichloromethane	49.1	2.5	50	0	98	50	157			
4-Methyl-2-pentanone (MIBK)	123	13	125	0	98	20	182			
cis-1,3-Dichloropropene	46.1	2.5	50	0	92	63	131			
trans-1,3-Dichloropropene	43.3	2.5	50	0	87	65	136			
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131			
Toluene	48	1.3	50	0	96	68	130			
1,3-Dichloropropane	45.7	2.5	50	0	91	70	130			
Dibromochloromethane	42.5	2.5	50	0	85	42	155			
1,2-Dibromoethane (EDB)	93.6	5	100	0	94	70	130			
Tetrachloroethene	48.5	2.5	50	0	97	65	130			
1,1,1,2-Tetrachloroethane	48.8	2.5	50	0	98	70	130			
Chlorobenzene	47.4	2.5	50	0	95	70	130			
Ethylbenzene	51.5	1.3	50	0	103	68	130			
m,p-Xylene	50	1.3	50	0	100	68	131			
Bromoform	41.2	2.5	50	0	82	65	143			
Styrene	42.6	2.5	50	0	85	59	153			
o-Xylene	50	1.3	50	0	100	70	130			
1,1,2,2-Tetrachloroethane	43.7	2.5	50	0	87	67	130			
1,2,3-Trichloropropane	94.3	10	100	0	94	70	130			
Isopropylbenzene	46	2.5	50	0	92	55	138			
Bromobenzene	47.5	2.5	50	0	95	70	130			
n-Propylbenzene	48.1	2.5	50	0	96	67	133			
4-Chlorotoluene	45.8	2.5	50	0	92	70	130			
2-Chlorotoluene	45.6	2.5	50	0	91	70	130			
1,3,5-Trimethylbenzene	49.3	2.5	50	0	99	67	134			
tert-Butylbenzene	47.5	2.5	50	0	95	55	147			
1,2,4-Trimethylbenzene	49.1	2.5	50	0	98	65	135			
sec-Butylbenzene	47.2	2.5	50	0	94	68	135			
1,3-Dichlorobenzene	49.7	2.5	50	0	99	70	130			
1,4-Dichlorobenzene	45.6	2.5	50	0	91	70	130			
4-Isopropyltoluene	49.5	2.5	50	0	99	68	132			
1,2-Dichlorobenzene	44.8	2.5	50	0	90	70	130			
n-Butylbenzene	51.3	2.5	50	0	103	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	220	15	250	0	88	64	130			
1,2,4-Trichlorobenzene	45	10	50	0	90	62	133			
Naphthalene	38.7	10	50	0	77	32	166			
Hexachlorobutadiene	106	10	100	0	106	63	130			
1,2,3-Trichlorobenzene	45.5	10	50	0	91	55	138			
Surr: 1,2-Dichloroethane-d4	52.4		50		105	70	130			
Surr: Toluene-d8	48.2		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:**

16-Sep-11

## QC Summary Report

**Work Order:**

11090105

Surr: 4-Bromofluorobenzene

44.9

50

90

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:  
16-Sep-11

## QC Summary Report

Work Order:  
11090105

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11090708.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 11:24

Sample ID: 11090105-01AMSD

Units: µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 11:24

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	51.4	2.5	50	0	103	21	138	43.89	15.7(33)	
Chloromethane	65	10	50	0	130	23	144	57.18	12.9(27)	
Vinyl chloride	68	2.5	50	0	136	49	136	58.49	15.1(21)	
Chloroethane	65.6	2.5	50	0	131	21	159	56.85	14.3(40)	
Bromomethane	54.6	10	50	0	109	10	174	46.03	17.1(40)	
Trichlorofluoromethane	73.5	2.5	50	0	147	32	154	64.96	12.3(37)	
1,1-Dichloroethene	53.5	2.5	50	0	107	64	130	46.48	14.0(21)	
Dichloromethane	51.7	10	50	0	103	69	130	44.85	14.1(20)	
Freon-113	59.7	2.5	50	0	119	55	141	52.58	12.6(40)	
trans-1,2-Dichloroethene	54.6	2.5	50	0	109	63	130	47.34	14.3(20)	
Methyl tert-butyl ether (MTBE)	57.2	1.3	50	0	114	47	150	45.89	21.9(40)	
1,1-Dichloroethane	54.3	2.5	50	0	109	66	130	47.12	14.1(20)	
2-Butanone (MEK)	1030	50	1000	0	103	23	182	851.7	19.1(22)	
cis-1,2-Dichloroethene	55.4	2.5	50	0	111	70	130	47.67	15.0(20)	
Bromochloromethane	57.4	2.5	50	0	115	70	132	49.1	15.5(20)	
Chloroform	56.7	2.5	50	0	113	70	130	49.06	14.4(20)	
2,2-Dichloropropane	56.5	2.5	50	0	113	38	154	47.87	16.6(22)	
1,2-Dichloroethane	58.1	2.5	50	0	116	65	134	49.59	15.9(20)	
1,1,1-Trichloroethane	57.7	2.5	50	0	115	65	136	49.22	15.9(20)	
1,1-Dichloropropene	58.3	2.5	50	0	117	68	132	50.63	14.2(20)	
Carbon tetrachloride	57.7	2.5	50	0	115	58	148	49.25	15.8(20)	
Benzene	56	1.3	50	0	112	59	138	49.08	13.2(21)	
Dibromomethane	58.3	2.5	50	0	117	70	130	49.18	16.9(20)	
1,2-Dichloropropane	54	2.5	50	0	108	70	131	46.83	14.2(20)	
Trichloroethene	55.3	2.5	50	0	111	65	144	48.7	12.7(20)	
Bromodichloromethane	57.4	2.5	50	0	115	50	157	49.11	15.5(20)	
4-Methyl-2-pentanone (MIBK)	152	13	125	0	122	20	182	123	21.3(20)	R5
cis-1,3-Dichloropropene	53.7	2.5	50	0	107	63	131	46.09	15.3(20)	
trans-1,3-Dichloropropene	51.2	2.5	50	0	102	65	136	43.3	16.7(20)	
1,1,2-Trichloroethane	57.6	2.5	50	0	115	70	131	49.2	15.7(20)	
Toluene	54.5	1.3	50	0	109	68	130	47.98	12.8(20)	
1,3-Dichloropropane	54	2.5	50	0	108	70	130	45.68	16.7(20)	
Dibromochloromethane	50.1	2.5	50	0	100	42	155	42.52	16.4(20)	
1,2-Dibromoethane (EDB)	110	5	100	0	110	70	130	93.57	16.1(20)	
Tetrachloroethene	56	2.5	50	0	112	65	130	48.5	14.3(20)	
1,1,1,2-Tetrachloroethane	56	2.5	50	0	112	70	130	48.84	13.7(20)	
Chlorobenzene	53.2	2.5	50	0	106	70	130	47.36	11.7(20)	
Ethylbenzene	58.3	1.3	50	0	117	68	130	51.5	12.3(20)	
m,p-Xylene	56.8	1.3	50	0	114	68	131	50.04	12.7(20)	
Bromoform	50.8	2.5	50	0	102	65	143	41.22	20.8(20)	R5
Styrene	48.7	2.5	50	0	97	59	153	42.62	13.4(37)	
o-Xylene	56.6	1.3	50	0	113	70	130	50.03	12.3(20)	
1,1,1,2,2-Tetrachloroethane	52.7	2.5	50	0	105	67	130	43.7	18.6(20)	
1,2,3-Trichloropropane	112	10	100	0	112	70	130	94.34	17.2(20)	
Isopropylbenzene	50.8	2.5	50	0	102	55	138	45.97	10.0(20)	
Bromobenzene	52.5	2.5	50	0	105	70	130	47.48	10.1(20)	
n-Propylbenzene	52.6	2.5	50	0	105	67	133	48.14	8.8(30)	
4-Chlorotoluene	51.2	2.5	50	0	102	70	130	45.79	11.1(20)	
2-Chlorotoluene	50.8	2.5	50	0	102	70	130	45.59	10.8(20)	
1,3,5-Trimethylbenzene	54.6	2.5	50	0	109	67	134	49.27	10.2(21)	
tert-Butylbenzene	53	2.5	50	0	106	55	147	47.5	10.9(20)	
1,2,4-Trimethylbenzene	54.8	2.5	50	0	110	65	135	49.14	11.0(25)	
sec-Butylbenzene	52.3	2.5	50	0	105	68	135	47.15	10.4(20)	
1,3-Dichlorobenzene	55.9	2.5	50	0	112	70	130	49.69	11.7(20)	
1,4-Dichlorobenzene	51.3	2.5	50	0	103	70	130	45.63	11.8(20)	
4-Isopropyltoluene	54.8	2.5	50	0	110	68	132	49.51	10.2(20)	
1,2-Dichlorobenzene	51.2	2.5	50	0	102	70	130	44.79	13.4(20)	
n-Butylbenzene	57.5	2.5	50	0	115	62	134	51.29	11.3(21)	
1,2-Dibromo-3-chloropropane (DBCP)	274	15	250	0	110	64	130	220.3	21.8(20)	R5
1,2,4-Trichlorobenzene	55.2	10	50	0	110	62	133	44.96	20.4(29)	
Naphthalene	50.7	10	50	0	101	32	166	38.71	26.8(40)	
Hexachlorobutadiene	126	10	100	0	126	63	130	105.8	17.7(21)	
1,2,3-Trichlorobenzene	57.7	10	50	0	115	55	138	45.5	23.7(36)	
Surr: 1,2-Dichloroethane-d4	54.3		50		109	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:**

16-Sep-11

## QC Summary Report

**Work Order:**

11090105

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Surr: Toluene-d8	47.9	50	96	70	130
Surr: 4-Bromofluorobenzene	44.5	50	89	70	130

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**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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

R5 = MS/MSD RPD exceeded the laboratory control limit. Recovery met acceptance criteria.

**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 : BMIS11090105**  
**Report Due By : 5:00 PM On : 16-Sep-2011**

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215  
 Client's COC # : 25567

**Report Attention**      **Phone Number**      **Email Address**  
 David Corner      (619) 726-7311 x      cornerd@battelle.org  
 Betsy Cutie      (614) 424-4899 x      cutiee@battelle.org  
 Shane Walton      (614) 424-4117 x      waltonss@battelle.org

**Job :** 100006114/JPL Groundwater Monitoring  
**QC Level :** DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/Concal data, LCS, MS/MSD With Surrogates  
**Job :** 100006114/JPL Groundwater Monitoring  
**QC Level :** DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/Concal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	Requested Tests			Sample Remarks
				314_W	METALS_D W	VOC_TIC_W	
BMI11090105-01A	MW-22-3	AQ 08/31/11 08:53	5 0 10	Perchlorate	Cr	VOC by 524 Criteria	
BMI11090105-02A	MW-22-2	AQ 08/31/11 09:16	5 0 10	Perchlorate	Cr	VOC by 524 Criteria	
BMI11090105-03A	MW-22-1	AQ 08/31/11 09:41	5 0 10	Perchlorate	Cr	VOC by 524 Criteria	
BMI11090105-04A	EB-07-08/31/11	AQ 08/31/11 09:32	5 0 10	Perchlorate	Cr	VOC by 524 Criteria	
BMI11090105-05A	TB-07-08/31/11	AQ 08/31/11 07:30	1 0 10			VOC by 524 Criteria	Reno Trip Blank 6/7/11

**Comments:** No security seals. Frozen ice. Temp Blank #9025 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).

**Logged in by:** Elizabeth Calder      **Signature**      Elizabeth Adcox      **Print Name**  
 Alpha Analytical, Inc.      **Company**      9-1-11 1601      **Date/Time**

**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:**

Name BATTELLE / GENARD TOMPKINS  
 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  NV \_\_\_\_\_ WA \_\_\_\_\_  
 ID \_\_\_\_\_ OR \_\_\_\_\_ OTHER \_\_\_\_\_ Page # 1 of 1

Analyses Required

Required QC Level?  
 I  II  III  IV

EDV/EDV? YES  NO \_\_\_\_\_

Global ID # \_\_\_\_\_

REMARKS

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by	Lab ID Number (Use Only)	Office (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOC's (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	Other	REMARKS
0853	8/31/11	AQ	CHASSE BRUBON	BMT11090105	61		MW - 22 - 3	NORM		S - VARIATIONS	X	X	X		
0916	8/31/11						MW - 22 - 2			S - VARIATIONS	X	X	X		
0941	8/31/11						MW - 22 - 1			S - VARIATIONS	X	X	X		
0932	8/31/11						ERB-07-08/31/11			3V ZP	X	X	X		COAGULANTS BLANK
0730	8/31/11	AQ					OS-18-07-08/31/11			1V	X				TRAP BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
	Elizabeth Aldox	INSIGHTS ETEL, INC.	8/31/11	1500
	Elizabeth Aldox	Alpha	8/31/11	1500
	Elizabeth Aldox	Alpha	9-1-11	1601

\*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.



# Alpha Analytical, Inc.

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

Date: 15-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11090203

Cooler Temp: 0 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11090203-01A	MW-21-5	Aqueous
11090203-02A	MW-21-4	Aqueous
11090203-03A	MW-21-3	Aqueous
11090203-04A	MW-21-2	Aqueous
11090203-05A	MW-21-1	Aqueous
11090203-06A	EB-08-09/01/11	Aqueous
11090203-07A	TB-08-09/01/11	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11090203-01A	EPA Method 314.0	Perchlorate
11090203-02A	EPA Method 314.0	Perchlorate
11090203-03A	EPA Method 314.0	Perchlorate
11090203-04A	EPA Method 314.0	Perchlorate
11090203-05A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/02/11

Job: 100006114/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography  
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-21-5				
Lab ID: BMII1090203-01A Perchlorate	2.58	1.00 µg/L	09/06/11 11:51	09/06/11 17:42
Date Sampled 09/01/11 09:11				
Client ID: MW-21-4				
Lab ID: BMII1090203-02A Perchlorate	2.20	1.00 µg/L	09/06/11 11:51	09/06/11 18:01
Date Sampled 09/01/11 09:33				
Client ID: MW-21-3				
Lab ID: BMII1090203-03A Perchlorate	2.39	1.00 µg/L	09/06/11 11:51	09/06/11 18:19
Date Sampled 09/01/11 09:54				
Client ID: MW-21-2				
Lab ID: BMII1090203-04A Perchlorate	1.82	1.00 µg/L	09/06/11 11:51	09/16/11 18:37
Date Sampled 09/01/11 10:31				
Client ID: MW-21-1				
Lab ID: BMII1090203-05A Perchlorate	2.40	1.00 µg/L	09/06/11 11:51	09/06/11 19:33
Date Sampled 09/01/11 10:58				
Client ID: EB-08-09/01/11				
Lab ID: BMII1090203-06A Perchlorate	ND	1.00 µg/L	09/06/11 11:51	09/06/11 19:51
Date Sampled 09/01/11 10:49				

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.

9/15/11

Report Date



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/02/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-21-5				
Lab ID: BMII1090203-01A Chromium (Cr)	0.0058	0.0050 mg/L	09/06/11 14:00	09/07/11 00:25
Date Sampled 09/01/11 09:11				
Client ID: MW-21-4				
Lab ID: BMII1090203-02A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:31
Date Sampled 09/01/11 09:33				
Client ID: MW-21-3				
Lab ID: BMII1090203-03A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:37
Date Sampled 09/01/11 09:54				
Client ID: MW-21-2				
Lab ID: BMII1090203-04A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:06
Date Sampled 09/01/11 10:31				
Client ID: MW-21-1				
Lab ID: BMII1090203-05A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:12
Date Sampled 09/01/11 10:58				
Client ID: EB-08-09/01/11				
Lab ID: BMII1090203-06A Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:18
Date Sampled 09/01/11 10:49				

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.

9/15/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : MW-21-5 Lab ID : BMI11090203-01A Date Received : 09/02/11 Date Sampled : 09/01/11 09:11	*** None Found ***	ND	09/06/11 14:03	09/06/11 14:03
Client ID : MW-21-4 Lab ID : BMI11090203-02A Date Received : 09/02/11 Date Sampled : 09/01/11 09:33	*** None Found ***	ND	09/06/11 14:24	09/06/11 14:24
Client ID : MW-21-3 Lab ID : BMI11090203-03A Date Received : 09/02/11 Date Sampled : 09/01/11 09:54	*** None Found ***	ND	09/06/11 14:46	09/06/11 14:46
Client ID : MW-21-2 Lab ID : BMI11090203-04A Date Received : 09/02/11 Date Sampled : 09/01/11 10:31	*** None Found ***	ND	09/06/11 15:08	09/06/11 15:08
Client ID : MW-21-1 Lab ID : BMI11090203-05A Date Received : 09/02/11 Date Sampled : 09/01/11 10:58	*** None Found ***	ND	09/06/11 15:29	09/06/11 15:29
Client ID : EB-08-09/01/11 Lab ID : BMI11090203-06A Date Received : 09/02/11 Date Sampled : 09/01/11 10:49	*** None Found ***	ND	09/06/11 13:20	09/06/11 13:20
Client ID : TB-08-09/01/11 Lab ID : BMI11090203-07A Date Received : 09/02/11 Date Sampled : 09/01/11 07:30	*** None Found ***	ND	09/06/11 13:41	09/06/11 13:41





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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

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*PS*

9/16/11

**Report Date**

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-01A  
Client I.D. Number: MW-21-5

Sampled: 09/01/11 09:11  
Received: 09/02/11  
Extracted: 09/06/11 14:03  
Analyzed: 09/06/11 14:03

### 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	4.9	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	1.2	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

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Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-02A  
Client I.D. Number: MW-21-4

Sampled: 09/01/11 09:33  
Received: 09/02/11  
Extracted: 09/06/11 14:24  
Analyzed: 09/06/11 14:24

### 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	7.1	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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	1.5	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

9/16/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-03A  
Client I.D. Number: MW-21-3

Sampled: 09/01/11 09:54  
Received: 09/02/11  
Extracted: 09/06/11 14:46  
Analyzed: 09/06/11 14:46

### 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	0.58	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	7.1	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	1.4	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	96	(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	3.9	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/16/11

Report Date



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-04A  
Client I.D. Number: MW-21-2

Sampled: 09/01/11 10:31  
Received: 09/02/11  
Extracted: 09/06/11 15:08  
Analyzed: 09/06/11 15:08

### 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	2.7	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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	2.2	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

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9/16/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-05A  
Client I.D. Number: MW-21-1

Sampled: 09/01/11 10:58  
Received: 09/02/11  
Extracted: 09/06/11 15:29  
Analyzed: 09/06/11 15:29

### 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	1.0	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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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	0.54	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

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

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9/16/11

Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-06A  
Client I.D. Number: EB-08-09/01/11

Sampled: 09/01/11 10:49  
Received: 09/02/11  
Extracted: 09/06/11 13:20  
Analyzed: 09/06/11 13:20

### 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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 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

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090203-07A  
Client I.D. Number: TB-08-09/01/11

Sampled: 09/01/11 07:30  
Received: 09/02/11  
Extracted: 09/06/11 13:41  
Analyzed: 09/06/11 13:41

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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

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9/16/11

Report Date

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# Alpha Analytical, Inc.

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

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

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## VOC Sample Preservation Report

**Work Order:** BMI11090203

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11090203-01A	MW-21-5	Aqueous	2
11090203-02A	MW-21-4	Aqueous	2
11090203-03A	MW-21-3	Aqueous	2
11090203-04A	MW-21-2	Aqueous	2
11090203-05A	MW-21-1	Aqueous	2
11090203-06A	EB-08-09/01/11	Aqueous	2
11090203-07A	TB-08-09/01/11	Aqueous	2

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**9/16/11**  
**Report Date**

*Page 1 of 1*



# Alpha Analytical, Inc.

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

Date:  
13-Sep-11

## QC Summary Report

Work Order:  
11090203

### Method Blank

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

File ID: **14** Batch ID: **27248** Analysis Date: **09/06/2011 12:48**  
Sample ID: **MB-27248** Units: **µg/L** Run ID: **IC\_3\_110906A** Prep Date: **09/06/2011 11:51**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual  
Perchlorate ND 1

### Laboratory Fortified Blank

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

File ID: **15** Batch ID: **27248** Analysis Date: **09/06/2011 13:06**  
Sample ID: **LFB-27248** Units: **µg/L** Run ID: **IC\_3\_110906A** Prep Date: **09/06/2011 11:51**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual  
Perchlorate 24.4 2 25 98 85 115

### Sample Matrix Spike

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

File ID: **34** Batch ID: **27248** Analysis Date: **09/06/2011 18:56**  
Sample ID: **11090203-04ALFM** Units: **µg/L** Run ID: **IC\_3\_110906A** Prep Date: **09/06/2011 11:51**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual  
Perchlorate 23.8 2 25 1.821 88 80 120

### Sample Matrix Spike Duplicate

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

File ID: **35** Batch ID: **27248** Analysis Date: **09/06/2011 19:14**  
Sample ID: **11090203-04ALFMD** Units: **µg/L** Run ID: **IC\_3\_110906A** Prep Date: **09/06/2011 11:51**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDPRefVal %RPD(Limit) Qual  
Perchlorate 24.2 2 25 1.821 89 80 120 23.78 1.6(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.



# Alpha Analytical, Inc.

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Date:  
15-Sep-11

## QC Summary Report

Work Order:  
11090203

### Method Blank

File ID: 090611.B\105\_M.D\

Sample ID: MB-27253

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

Type: MBLK Test Code: EPA Method 200.8

Batch ID: 27253

Analysis Date: 09/06/2011 22:56

Units : mg/L Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

### Laboratory Control Spike

File ID: 090611.B\106\_M.D\

Sample ID: LCS-27253

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0502	0.005	0.05		100	85	115			

Type: LCS Test Code: EPA Method 200.8

Batch ID: 27253

Analysis Date: 09/06/2011 23:02

Units : mg/L Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

### Sample Matrix Spike

File ID: 090611.B\111\_M.D\

Sample ID: 11083104-08AMS

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0523	0.005	0.05		0	105	70	130		

Type: MS Test Code: EPA Method 200.8

Batch ID: 27253

Analysis Date: 09/06/2011 23:32

Units : mg/L Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

### Sample Matrix Spike Duplicate

File ID: 090611.B\112\_M.D\

Sample ID: 11083104-08AMSD

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0507	0.005	0.05		0	101	70	130	0.05231 3.2(20)	

Type: MSD Test Code: EPA Method 200.8

Batch ID: 27253

Analysis Date: 09/06/2011 23:37

Units : mg/L Run ID: ICP/MS\_110906E

Prep Date: 09/06/2011 14:00

### 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.



# Alpha Analytical, Inc.

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

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

Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090203

### Method Blank

Type: MBLK Test Code: EPA Method SW8260B

File ID: 11090606.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 10:27

Sample ID: MBLK MS15W0906M

Units : µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 10:27

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	10.5		10		105	70	130			
Surr: Toluene-d8	9.89		10		99	70	130			



# Alpha Analytical, Inc.

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

**Date:**

*16-Sep-11*

## QC Summary Report

**Work Order:**

11090203

Surr: 4-Bromofluorobenzene

8.76

10

88

70

130



# Alpha Analytical, Inc.

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

Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090203

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11090604.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 09:29

Sample ID: LCS MS15W0906M

Units: µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 09:29

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.53	1	10		85	70	130			
Chloromethane	11.2	2	10		112	70	130			
Vinyl chloride	10.3	1	10		103	70	130			
Chloroethane	11.9	1	10		119	70	130			
Bromomethane	7.6	2	10		76	70	130			
Trichlorofluoromethane	12.6	1	10		126	70	130			
1,1-Dichloroethene	9.62	1	10		96	70	130			
Dichloromethane	9.55	2	10		96	70	130			
Freon-113	10.6	1	10		106	70	137			
trans-1,2-Dichloroethene	9.97	1	10		99.7	70	130			
Methyl tert-butyl ether (MTBE)	10.1	0.5	10		101	70	130			
1,1-Dichloroethane	9.92	1	10		99	70	130			
2-Butanone (MEK)	262	10	200		131	70	130(130)			L51
cis-1,2-Dichloroethene	10	1	10		100	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.2	1	10		102	70	130			
2,2-Dichloropropane	10.2	1	10		102	70	130			
1,2-Dichloroethane	10.5	1	10		105	70	130			
1,1,1-Trichloroethane	10.4	1	10		104	70	130			
1,1-Dichloropropene	10.6	1	10		106	70	130			
Carbon tetrachloride	10.2	1	10		102	70	130			
Benzene	10.3	0.5	10		103	70	130			
Dibromomethane	10.5	1	10		105	70	130			
1,2-Dichloropropane	9.75	1	10		98	70	130			
Trichloroethene	10.2	1	10		102	70	130			
Bromodichloromethane	10.5	1	10		105	70	130			
4-Methyl-2-pentanone (MIBK)	28.8	2.5	25		115	20	182			
cis-1,3-Dichloropropene	10.1	1	10		101	70	130			
trans-1,3-Dichloropropene	9.39	1	10		94	70	130			
1,1,2-Trichloroethane	10.5	1	10		105	70	130			
Toluene	9.96	0.5	10		99.6	70	130			
1,3-Dichloropropane	9.73	1	10		97	70	130			
Dibromochloromethane	9.09	1	10		91	70	130			
1,2-Dibromoethane (EDB)	19.7	2	20		98	70	130			
Tetrachloroethene	9.97	1	10		99.7	70	130			
1,1,1,2-Tetrachloroethane	10.3	1	10		103	70	130			
Chlorobenzene	9.73	1	10		97	70	130			
Ethylbenzene	10.7	0.5	10		107	70	130			
m,p-Xylene	10.4	0.5	10		104	70	130			
Bromoform	9.2	1	10		92	70	130			
Styrene	8.86	1	10		89	70	130			
o-Xylene	10.4	0.5	10		104	70	130			
1,1,2,2-Tetrachloroethane	9.34	1	10		93	70	130			
1,2,3-Trichloropropane	20.1	2	20		101	70	130			
Isopropylbenzene	9.46	1	10		95	70	130			
Bromobenzene	9.76	1	10		98	70	130			
n-Propylbenzene	9.78	1	10		98	70	130			
4-Chlorotoluene	9.48	1	10		95	70	130			
2-Chlorotoluene	9.39	1	10		94	70	130			
1,3,5-Trimethylbenzene	10.1	1	10		101	70	130			
tert-Butylbenzene	9.79	1	10		98	70	130			
1,2,4-Trimethylbenzene	10.2	1	10		102	70	130			
sec-Butylbenzene	9.64	1	10		96	70	130			
1,3-Dichlorobenzene	10.3	1	10		103	70	130			
1,4-Dichlorobenzene	9.39	1	10		94	70	130			
4-Isopropyltoluene	10.1	1	10		101	70	130			
1,2-Dichlorobenzene	9.42	1	10		94	70	130			
n-Butylbenzene	10.5	1	10		105	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	49.1	3	50		98	67	130			
1,2,4-Trichlorobenzene	9.36	2	10		94	70	130			
Naphthalene	8.56	2	10		86	70	130			
Hexachlorobutadiene	21.3	2	20		106	70	130			
1,2,3-Trichlorobenzene	9.73	2	10		97	70	130			
Surr: 1,2-Dichloroethane-d4	10.5		10		105	70	130			
Surr: Toluene-d8	9.57		10		96	70	130			



# Alpha Analytical, Inc.

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

Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090203

Surr: 4-Bromofluorobenzene

9.17

10

92

70

130



# Alpha Analytical, Inc.

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Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090203

### Sample Matrix Spike

Type: MS

Test Code: EPA Method SW8260B

File ID: 11090607.D

Batch ID: MS15W0906M

Analysis Date: 09/06/2011 10:48

Sample ID: 11090203-04AMS

Units: µg/L

Run ID: MSD\_15\_110906A

Prep Date: 09/06/2011 10:48

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	34.6	2.5	50	0	69	21	138			
Chloromethane	48.5	10	50	0	97	23	144			
Vinyl chloride	51.1	2.5	50	0	102	49	136			
Chloroethane	53.4	2.5	50	0	107	21	159			
Bromomethane	37.6	10	50	0	75	10	174			
Trichlorofluoromethane	60	2.5	50	0	120	32	154			
1,1-Dichloroethene	44.4	2.5	50	0	89	64	130			
Dichloromethane	44	10	50	0	88	69	130			
Freon-113	50.6	2.5	50	0	101	55	141			
trans-1,2-Dichloroethene	45.6	2.5	50	0	91	63	130			
Methyl tert-butyl ether (MTBE)	48.6	1.3	50	0	97	47	150			
1,1-Dichloroethane	45.6	2.5	50	0	91	66	130			
2-Butanone (MEK)	893	50	1000	0	89	23	182			
cis-1,2-Dichloroethene	46.9	2.5	50	0	94	70	130			
Bromochloromethane	48.3	2.5	50	0	97	70	132			
Chloroform	50.8	2.5	50	2.66	96	70	130			
2,2-Dichloropropane	46.2	2.5	50	0	92	38	154			
1,2-Dichloroethane	50	2.5	50	0	100	65	134			
1,1,1-Trichloroethane	48	2.5	50	0	96	65	136			
1,1-Dichloropropene	48.9	2.5	50	0	98	68	132			
Carbon tetrachloride	48.1	2.5	50	0	96	58	148			
Benzene	47.5	1.3	50	0	95	59	138			
Dibromomethane	49.9	2.5	50	0	99.7	70	130			
1,2-Dichloropropane	45.7	2.5	50	0	91	70	131			
Trichloroethene	46.9	2.5	50	0	94	65	144			
Bromodichloromethane	48.8	2.5	50	0	98	50	157			
4-Methyl-2-pentanone (MIBK)	132	13	125	0	105	20	182			
cis-1,3-Dichloropropene	45	2.5	50	0	90	63	131			
trans-1,3-Dichloropropene	43.3	2.5	50	0	87	65	136			
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131			
Toluene	45.1	1.3	50	0	90	68	130			
1,3-Dichloropropane	45.5	2.5	50	0	91	70	130			
Dibromochloromethane	42.5	2.5	50	0	85	42	155			
1,2-Dibromoethane (EDB)	92.1	5	100	0	92	70	130			
Tetrachloroethene	48	2.5	50	2.17	92	65	130			
1,1,1,2-Tetrachloroethane	47	2.5	50	0	94	70	130			
Chlorobenzene	44.9	2.5	50	0	90	70	130			
Ethylbenzene	48.3	1.3	50	0	97	68	130			
m,p-Xylene	47.4	1.3	50	0	95	68	131			
Bromoform	43.2	2.5	50	0	86	65	143			
Styrene	40.7	2.5	50	0	81	59	153			
o-Xylene	47.1	1.3	50	0	94	70	130			
1,1,2,2-Tetrachloroethane	45.4	2.5	50	0	91	67	130			
1,2,3-Trichloropropane	96.8	10	100	0	97	70	130			
Isopropylbenzene	43.3	2.5	50	0	87	55	138			
Bromobenzene	45.3	2.5	50	0	91	70	130			
n-Propylbenzene	44.8	2.5	50	0	90	67	133			
4-Chlorotoluene	43.5	2.5	50	0	87	70	130			
2-Chlorotoluene	42.9	2.5	50	0	86	70	130			
1,3,5-Trimethylbenzene	46.6	2.5	50	0	93	67	134			
tert-Butylbenzene	45.1	2.5	50	0	90	55	147			
1,2,4-Trimethylbenzene	46.4	2.5	50	0	93	65	135			
sec-Butylbenzene	44.7	2.5	50	0	89	68	135			
1,3-Dichlorobenzene	47.2	2.5	50	0	94	70	130			
1,4-Dichlorobenzene	43.6	2.5	50	0	87	70	130			
4-Isopropyltoluene	46.6	2.5	50	0	93	68	132			
1,2-Dichlorobenzene	43.6	2.5	50	0	87	70	130			
n-Butylbenzene	48	2.5	50	0	96	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	234	15	250	0	94	64	130			
1,2,4-Trichlorobenzene	43.4	10	50	0	87	62	133			
Naphthalene	39.9	10	50	0	80	32	166			
Hexachlorobutadiene	99	10	100	0	99	63	130			
1,2,3-Trichlorobenzene	45.2	10	50	0	90	55	138			
Surr: 1,2-Dichloroethane-d4	54.4		50		109	70	130			
Surr: Toluene-d8	47.2		50		94	70	130			





# Alpha Analytical, Inc.

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

**Date:**  
16-Sep-11

## QC Summary Report

**Work Order:**  
11090203

Surr: 4-Bromofluorobenzene

46.2

50

92

70

130



# Alpha Analytical, Inc.

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

Date:  
16-Sep-11

## QC Summary Report

Work Order:  
11090203

### Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8260B**

File ID: **11090608.D**

Batch ID: **MS15W0906M**

Analysis Date: **09/06/2011 11:10**

Sample ID: **11090203-04AMSD**

Units: **µg/L**

Run ID: **MSD\_15\_110906A**

Prep Date: **09/06/2011 11:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	35.3	2.5	50	0	71	21	138	34.57	2.2(33)	
Chloromethane	49.1	10	50	0	98	23	144	48.53	1.2(27)	
Vinyl chloride	54	2.5	50	0	108	49	136	51.13	5.4(21)	
Chloroethane	56.7	2.5	50	0	113	21	159	53.38	6.0(40)	
Bromomethane	42.4	10	50	0	85	10	174	37.64	12.0(40)	
Trichlorofluoromethane	61.4	2.5	50	0	123	32	154	59.95	2.5(37)	
1,1-Dichloroethene	46.2	2.5	50	0	92	64	130	44.35	4.1(21)	
Dichloromethane	45.6	10	50	0	91	69	130	44	3.5(20)	
Freon-113	51.4	2.5	50	0	103	55	141	50.58	1.6(40)	
trans-1,2-Dichloroethene	47.9	2.5	50	0	96	63	130	45.58	5.0(20)	
Methyl tert-butyl ether (MTBE)	50.3	1.3	50	0	101	47	150	48.56	3.5(40)	
1,1-Dichloroethane	48	2.5	50	0	96	66	130	45.61	5.2(20)	
2-Butanone (MEK)	881	50	1000	0	88	23	182	893.5	1.4(22)	
cis-1,2-Dichloroethene	48.7	2.5	50	0	97	70	130	46.91	3.8(20)	
Bromochloromethane	50.2	2.5	50	0	100	70	132	48.28	3.9(20)	
Chloroform	53	2.5	50	2.66	101	70	130	50.79	4.2(20)	
2,2-Dichloropropane	48.8	2.5	50	0	98	38	154	46.19	5.5(22)	
1,2-Dichloroethane	51.1	2.5	50	0	102	65	134	49.98	2.2(20)	
1,1,1-Trichloroethane	50.6	2.5	50	0	101	65	136	48.03	5.1(20)	
1,1-Dichloropropene	50.9	2.5	50	0	102	68	132	48.92	3.9(20)	
Carbon tetrachloride	50.5	2.5	50	0	101	58	148	48.08	4.8(20)	
Benzene	49	1.3	50	0	98	59	138	47.52	3.0(21)	
Dibromomethane	49.9	2.5	50	0	99.9	70	130	49.86	0.2(20)	
1,2-Dichloropropane	47	2.5	50	0	94	70	131	45.7	2.7(20)	
Trichloroethene	48.4	2.5	50	0	97	65	144	46.93	3.1(20)	
Bromodichloromethane	49.8	2.5	50	0	99.7	50	157	48.78	2.1(20)	
4-Methyl-2-pentanone (MIBK)	128	13	125	0	102	20	182	131.6	2.7(20)	
cis-1,3-Dichloropropene	45.9	2.5	50	0	92	63	131	44.96	2.1(20)	
trans-1,3-Dichloropropene	43.8	2.5	50	0	88	65	136	43.31	1.1(20)	
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131	49.17	0.1(20)	
Toluene	47.6	1.3	50	0	95	68	130	45.14	5.3(20)	
1,3-Dichloropropane	46.6	2.5	50	0	93	70	130	45.46	2.4(20)	
Dibromochloromethane	44.1	2.5	50	0	88	42	155	42.48	3.6(20)	
1,2-Dibromoethane (EDB)	95.2	5	100	0	95	70	130	92.13	3.3(20)	
Tetrachloroethene	50.5	2.5	50	2.17	97	65	130	48.04	5.0(20)	
1,1,1,2-Tetrachloroethane	49	2.5	50	0	98	70	130	46.97	4.2(20)	
Chlorobenzene	46.2	2.5	50	0	92	70	130	44.87	3.0(20)	
Ethylbenzene	50.6	1.3	50	0	101	68	130	48.32	4.7(20)	
m,p-Xylene	49.1	1.3	50	0	98	68	131	47.38	3.5(20)	
Bromoform	43.9	2.5	50	0	88	65	143	43.24	1.6(20)	
Styrene	42.4	2.5	50	0	85	59	153	40.73	3.9(37)	
o-Xylene	49.2	1.3	50	0	98	70	130	47.08	4.5(20)	
1,1,2,2-Tetrachloroethane	45.4	2.5	50	0	91	67	130	45.42	0.1(20)	
1,2,3-Trichloropropane	96.7	10	100	0	97	70	130	96.75	0.1(20)	
Isopropylbenzene	45.3	2.5	50	0	91	55	138	43.34	4.4(20)	
Bromobenzene	47.3	2.5	50	0	95	70	130	45.25	4.5(20)	
n-Propylbenzene	47	2.5	50	0	94	67	133	44.76	4.9(30)	
4-Chlorotoluene	45.3	2.5	50	0	91	70	130	43.54	4.0(20)	
2-Chlorotoluene	44.9	2.5	50	0	90	70	130	42.89	4.7(20)	
1,3,5-Trimethylbenzene	48.4	2.5	50	0	97	67	134	46.61	3.7(21)	
tert-Butylbenzene	47.1	2.5	50	0	94	55	147	45.05	4.5(20)	
1,2,4-Trimethylbenzene	48.3	2.5	50	0	97	65	135	46.37	4.1(25)	
sec-Butylbenzene	46.6	2.5	50	0	93	68	135	44.7	4.1(20)	
1,3-Dichlorobenzene	49.3	2.5	50	0	99	70	130	47.2	4.4(20)	
1,4-Dichlorobenzene	45.1	2.5	50	0	90	70	130	43.55	3.4(20)	
4-Isopropyltoluene	48.5	2.5	50	0	97	68	132	46.6	4.0(20)	
1,2-Dichlorobenzene	45.1	2.5	50	0	90	70	130	43.59	3.3(20)	
n-Butylbenzene	50.4	2.5	50	0	101	62	134	48.03	4.7(21)	
1,2-Dibromo-3-chloropropane (DBCP)	242	15	250	0	97	64	130	234	3.2(20)	
1,2,4-Trichlorobenzene	47.1	10	50	0	94	62	133	43.43	8.2(29)	
Naphthalene	43.8	10	50	0	88	32	166	39.91	9.2(40)	
Hexachlorobutadiene	108	10	100	0	108	63	130	99.01	8.6(21)	
1,2,3-Trichlorobenzene	49.8	10	50	0	99.5	55	138	45.24	9.5(36)	
Surr: 1,2-Dichloroethane-d4	53.1		50		106	70	130			
Surr: Toluene-d8	48.2		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:**

16-Sep-11

## QC Summary Report

**Work Order:**

11090203

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Surr: 4-Bromofluorobenzene	45.7	50	91	70	130
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**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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L51 = Analyte recovery was above acceptance limits for the LCS, but was acceptable in the MS/MSD.

# 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 : BMIS11090203**  
**Report Due By : 5:00 PM On : 16-Sep-2011**

**Client:** Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

**Client's COC # :** 25566

**Report Attention**    **Phone Number**    **Email Address**

David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cuite	(614) 424-4899 x	cuitee@battelle.org
Shane Walton	(614) 424-4117 x	waltonsa@battelle.org

**Job :** 100006114/JPL Groundwater Monitoring    **Job :** 100006114/JPL Groundwater Monitoring

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

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles			314_W	METALS_D W	VOC_TIC_W	VOC_W	Requested Tests	Sample Remarks
			Alpha	Sub	TAT						
BM11090203-01A	NW-21-5	AQ 09/01/11 09:11	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	Level IV QC	
BM11090203-02A	NW-21-4	AQ 09/01/11 09:33	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria		
BM11090203-03A	NW-21-3	AQ 09/01/11 09:54	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria		
BM11090203-04A	NW-21-2	AQ 09/01/11 10:31	10	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	MS/MSD	
BM11090203-05A	NW-21-1	AQ 09/01/11 10:58	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	Level IV QC	
BM11090203-06A	EB-08-09/01/11	AQ 09/01/11 10:49	5	0	9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria		
BM11090203-07A	TB-08-09/01/11	AQ 09/01/11 07:30	1	0	9			VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 4/6/11	

**Comments:** Security seals intact. Frozen ice. Temp Blank #8746 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).:

**Logged in by:** Elizabeth Alder    Elizabeth Alder    Elizabeth Alder    Alpha Analytical, Inc.    9.2.11 1050

**Signature**    **Print Name**    **Company**    **Date/Time**

**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:**

Name BATTELLE / GERALD TAMPLINS  
 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 States? **25566**  
 AZ  CA  NV  WA   
 ID  OR  OTHER   
 Page # 1 of 1

Client Name BATTELLE / DAVID CONNER PO. # 287215 Job # 10006114  
 Address 3990 OLD FAWN AVE. C-205 Email Address CONNER.D@BATTELLE.ORG  
 City, State, Zip SAUN DIEGO, CA 92110 Phone # (619) 726-7311 Fax # (619) 458-6614

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by Lab ID Number (Use City)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	EDD / EDF? YES NO	Global ID #	REMARKS	Required QC Level? I II III IV
0933	9/01/11	AQ	BMT11090203-01		MW - 21 - 5			S-VARIABLES	X	X	X			LEVEL IV QC	
0954	9/01/11	AQ			MW - 21 - 4			S-VARIABLES	X	X	X				
1031	9/01/11	AQ			MW - 21 - 3			S-VARIABLES	X	X	X				
1058	9/01/11	AQ			MW - 21 - 2			10 - VARIABLES	X	X	X			MIS/MISD	
					MW - 21 - 1			S-VARIABLES	X	X	X			LEVEL IV QC	
1049	9/1/11	AQ						3v 2p	X	X	X			EQUIPMENT BLANK	
0730	9/1/11	AQ						1v	X					TRAP BLANK	

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHRIS BRADON	BRADON EET, INC.	09/01/11	1145
<i>[Signature]</i>	Anthony ALEX	Alpha Analytical	9/1/11	1410
<i>[Signature]</i>	Elizabeth Adcox	Alpha	9.2.11	1050

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Lier V-Voa S-Soil Jar O-Orbo T-Tecllar 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.



# Alpha Analytical, Inc.

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

Date: 21-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11090622

Cooler Temp: 0°C

Alpha's Sample ID	Client's Sample ID	Matrix
11090622-01A	MW-20-5	Aqueous
11090622-02A	MW-20-4	Aqueous
11090622-03A	MW-20-3	Aqueous
11090622-04A	MW-20-2	Aqueous
11090622-05A	MW-20-1	Aqueous
11090622-06A	DUPE-04-3Q11	Aqueous
11090622-07A	EB-09-09/02/11	Aqueous
11090622-08A	TB-09-09/02/11	Aqueous

### Manually Integrated Analytes

<u>Alpha's Sample ID</u>	<u>Test Reference</u>	<u>Analyte</u>
11090622-04A	EPA Method 314.0	Perchlorate
11090622-05A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/03/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-20-5</b> Lab ID : BM111090622-01A Perchlorate Date Sampled 09/02/11 08:46	ND	1.00 µg/L	09/12/11 15:22	09/12/11 17:13
Client ID: <b>MW-20-4</b> Lab ID : BM111090622-02A Perchlorate Date Sampled 09/02/11 09:20	ND	1.00 µg/L	09/12/11 15:22	09/12/11 17:32
Client ID: <b>MW-20-3</b> Lab ID : BM111090622-03A Perchlorate Date Sampled 09/02/11 09:47	ND	1.00 µg/L	09/12/11 15:22	09/12/11 17:50
Client ID: <b>MW-20-2</b> Lab ID : BM111090622-04A Perchlorate Date Sampled 09/02/11 10:12	2.50	1.00 µg/L	09/12/11 15:22	09/12/11 18:08
Client ID: <b>MW-20-1</b> Lab ID : BM111090622-05A Perchlorate Date Sampled 09/02/11 10:33	1.27	1.00 µg/L	09/12/11 15:22	09/12/11 18:27
Client ID: <b>DUPE-04-3Q11</b> Lab ID : BM111090622-06A Perchlorate Date Sampled 09/02/11 00:00	ND	1.00 µg/L	09/12/11 15:22	09/12/11 18:45
Client ID: <b>EB-09-09/02/11</b> Lab ID : BM111090622-07A Perchlorate Date Sampled 09/02/11 10:23	ND	1.00 µg/L	09/12/11 15:22	09/12/11 19:04

ND = Not Detected

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

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9/21/11

Report Date



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/03/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-20-5</b> Lab ID : BM11090622-01A Chromium (Cr) Date Sampled 09/02/11 08:46	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-4</b> Lab ID : BM11090622-02A Chromium (Cr) Date Sampled 09/02/11 09:20	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-3</b> Lab ID : BM11090622-03A Chromium (Cr) Date Sampled 09/02/11 09:47	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-2</b> Lab ID : BM11090622-04A Chromium (Cr) Date Sampled 09/02/11 10:12	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-1</b> Lab ID : BM11090622-05A Chromium (Cr) Date Sampled 09/02/11 10:33	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>DUPE-04-3Q11</b> Lab ID : BM11090622-06A Chromium (Cr) Date Sampled 09/02/11 00:00	ND	0.0050 mg/L	09/09/11	09/17/11
Client ID: <b>EB-09-09/02/11</b> Lab ID : BM11090622-07A Chromium (Cr) Date Sampled 09/02/11 10:23	ND	0.0050 mg/L	09/09/11	09/12/11

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

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*PS*  
9/20/11

**Report Date**





# 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: 100006114/JPL Groundwater Monitoring

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

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-20-5</b> Lab ID : <b>BMI11090622-01A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 08:46	Sulfur dioxide	16	2.0 µg/L	09/07/11 16:26 09/07/11 16:26
Client ID : <b>MW-20-4</b> Lab ID : <b>BMI11090622-02A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 09:20	Sulfur dioxide	12	2.0 µg/L	09/07/11 16:48 09/07/11 16:48
Client ID : <b>MW-20-3</b> Lab ID : <b>BMI11090622-03A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 09:47	Sulfur dioxide	12	2.0 µg/L	09/07/11 17:09 09/07/11 17:09
Client ID : <b>MW-20-2</b> Lab ID : <b>BMI11090622-04A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 10:12	Sulfur dioxide	2.8	2.0 µg/L	09/07/11 17:30 09/07/11 17:30
Client ID : <b>MW-20-1</b> Lab ID : <b>BMI11090622-05A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 10:33	Sulfur dioxide	4.3	2.0 µg/L	09/07/11 17:52 09/07/11 17:52
Client ID : <b>DUPE-04-3Q11</b> Lab ID : <b>BMI11090622-06A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 00:00	Sulfur dioxide	11	2.0 µg/L	09/07/11 18:13 09/07/11 18:13
Client ID : <b>EB-09-09/02/11</b> Lab ID : <b>BMI11090622-07A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 10:23	*** None Found ***	ND	2.0 µg/L	09/07/11 12:50 09/07/11 12:50
Client ID : <b>TB-09-09/02/11</b> Lab ID : <b>BMI11090622-08A</b> Date Received : 09/03/11 Date Sampled : 09/02/11 07:00	*** None Found ***	ND	2.0 µg/L	09/07/11 13:11 09/07/11 13:11



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

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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

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*PS*

9/19/11

**Report Date**

Page 1 of 1



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-01A  
Client I.D. Number: MW-20-5

Sampled: 09/02/11 08:46  
Received: 09/03/11  
Extracted: 09/07/11 16:26  
Analyzed: 09/07/11 16:26

### 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinclman, Quality Assurance Officer  
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

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9/19/11

Report Date

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-02A  
Client I.D. Number: MW-20-4

Sampled: 09/02/11 09:20  
Received: 09/03/11  
Extracted: 09/07/11 16:48  
Analyzed: 09/07/11 16:48

### 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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	100	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	85	(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 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

9/19/11

Report Date

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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.



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-03A  
Client I.D. Number: MW-20-3

Sampled: 09/02/11 09:47  
Received: 09/03/11  
Extracted: 09/07/11 17:09  
Analyzed: 09/07/11 17:09

### 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	0.74	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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BII11090622-04A  
Client I.D. Number: MW-20-2

Sampled: 09/02/11 10:12  
Received: 09/03/11  
Extracted: 09/07/11 17:30  
Analyzed: 09/07/11 17:30

### 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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-05A  
Client I.D. Number: MW-20-1

Sampled: 09/02/11 10:33  
Received: 09/03/11  
Extracted: 09/07/11 17:52  
Analyzed: 09/07/11 17:52

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-06A  
Client I.D. Number: DUPE-04-3Q11

Sampled: 09/02/11 00:00  
Received: 09/03/11  
Extracted: 09/07/11 18:13  
Analyzed: 09/07/11 18:13

### 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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-07A  
Client I.D. Number: EB-09-09/02/11

Sampled: 09/02/11 10:23  
Received: 09/03/11  
Extracted: 09/07/11 12:50  
Analyzed: 09/07/11 12:50

### 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	108	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	86	(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 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.

9/19/11

Report Date

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090622-08A  
Client I.D. Number: TB-09-09/02/11

Sampled: 09/02/11 07:00  
Received: 09/03/11  
Extracted: 09/07/11 13:11  
Analyzed: 09/07/11 13:11

### 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	109	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 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.

9/19/11

Report Date

Page 1 of 1



# Alpha Analytical, Inc.

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

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

---

## VOC Sample Preservation Report

**Work Order:** BMI11090622

**Job:** 100006114/JPL Groundwater Monitoring

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Alpha's Sample ID	Client's Sample ID	Matrix	pH
11090622-01A	MW-20-5	Aqueous	2
11090622-02A	MW-20-4	Aqueous	2
11090622-03A	MW-20-3	Aqueous	2
11090622-04A	MW-20-2	Aqueous	2
11090622-05A	MW-20-1	Aqueous	2
11090622-06A	DUPE-04-3Q11	Aqueous	2
11090622-07A	EB-09-09/02/11	Aqueous	2
11090622-08A	TB-09-09/02/11	Aqueous	2

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**9/19/11**

**Report Date**

*Page 1 of 1*



# Alpha Analytical, Inc.

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

Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090622

### Method Blank

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

File ID: **14** Batch ID: **27294** Analysis Date: **09/12/2011 16:18**  
Sample ID: **MB-27294** Units: **µg/L** Run ID: **IC\_3\_110912A** Prep Date: **09/12/2011 15:22**  
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: **15** Batch ID: **27294** Analysis Date: **09/12/2011 16:36**  
Sample ID: **LFB-27294** Units: **µg/L** Run ID: **IC\_3\_110912A** Prep Date: **09/12/2011 15:22**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 24.3 2 25 97 85 115

### Sample Matrix Spike

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

File ID: **31** Batch ID: **27294** Analysis Date: **09/12/2011 21:31**  
Sample ID: **11090825-05ALFM** Units: **µg/L** Run ID: **IC\_3\_110912A** Prep Date: **09/12/2011 15:22**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 26.6 2 25 0 106 80 120

### Sample Matrix Spike Duplicate

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

File ID: **32** Batch ID: **27294** Analysis Date: **09/12/2011 21:49**  
Sample ID: **11090825-05ALFMD** Units: **µg/L** Run ID: **IC\_3\_110912A** Prep Date: **09/12/2011 15:22**  
Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual  
Perchlorate 23.2 2 25 0 93 80 120 26.6 13.6(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.



# Alpha Analytical, Inc.

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Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090622

### Method Blank

Type: MBLK Test Code: EPA Method 200.8

File ID: 091211.B\019\_M.D\

Batch ID: 27282

Analysis Date: 09/12/2011 14:09

Sample ID: MB-27282

Units : mg/L

Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

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: 091211.B\020\_M.D\

Batch ID: 27282

Analysis Date: 09/12/2011 14:15

Sample ID: LCS-27282

Units : mg/L

Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0508	0.005	0.05		102	85	115			

### Sample Matrix Spike

Type: MS Test Code: EPA Method 200.8

File ID: 091211.B\025\_M.D\

Batch ID: 27282

Analysis Date: 09/12/2011 14:44

Sample ID: 11090825-05AMS

Units : mg/L

Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.051	0.005	0.05	0	102	70	130			

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method 200.8

File ID: 091211.B\026\_M.D\

Batch ID: 27282

Analysis Date: 09/12/2011 14:50

Sample ID: 11090825-05AMSD

Units : mg/L

Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0481	0.005	0.05	0	96	70	130	0.05101	6.0(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:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

### Method Blank

Type: MBLK Test Code: EPA Method SW8260B

File ID: 11090706.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 10:41

Sample ID: MBLK MS15W0907M

Units: µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 10:41

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	10.4		10		104	70	130			
Surr: Toluene-d8	9.82		10		98	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:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

Surr: 4-Bromofluorobenzene

9.09

10

91

70

130



# Alpha Analytical, Inc.

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Date:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11090704.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 09:46

Sample ID: LCS MS15W0907M

Units : µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 09:46

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	7.21	1	10		72	70	130			
Chloromethane	10.1	2	10		101	70	130			
Vinyl chloride	9.44	1	10		94	70	130			
Chloroethane	11.7	1	10		117	70	130			
Bromomethane	7.52	2	10		75	70	130			
Trichlorofluoromethane	12.6	1	10		126	70	130			
1,1-Dichloroethene	9.35	1	10		94	70	130			
Dichloromethane	9.14	2	10		91	70	130			
Freon-113	10.2	1	10		102	70	137			
trans-1,2-Dichloroethene	9.67	1	10		97	70	130			
Methyl tert-butyl ether (MTBE)	9.55	0.5	10		96	70	130			
1,1-Dichloroethane	9.57	1	10		96	70	130			
2-Butanone (MEK)	235	10	200		118	70	130			
cis-1,2-Dichloroethene	9.74	1	10		97	70	130			
Bromochloromethane	9.99	1	10		99.9	70	130			
Chloroform	9.96	1	10		99.6	70	130			
2,2-Dichloropropane	9.63	1	10		96	70	130			
1,2-Dichloroethane	10.3	1	10		103	70	130			
1,1,1-Trichloroethane	10.1	1	10		101	70	130			
1,1-Dichloropropene	10.3	1	10		103	70	130			
Carbon tetrachloride	9.76	1	10		98	70	130			
Benzene	9.99	0.5	10		99.9	70	130			
Dibromomethane	10.2	1	10		102	70	130			
1,2-Dichloropropane	9.63	1	10		96	70	130			
Trichloroethene	9.91	1	10		99	70	130			
Bromodichloromethane	10.1	1	10		101	70	130			
4-Methyl-2-pentanone (MIBK)	26.6	2.5	25		106	20	182			
cis-1,3-Dichloropropene	9.71	1	10		97	70	130			
trans-1,3-Dichloropropene	9.1	1	10		91	70	130			
1,1,2-Trichloroethane	10.4	1	10		104	70	130			
Toluene	9.91	0.5	10		99	70	130			
1,3-Dichloropropane	9.67	1	10		97	70	130			
Dibromochloromethane	8.87	1	10		89	70	130			
1,2-Dibromoethane (EDB)	19.8	2	20		99	70	130			
Tetrachloroethene	9.93	1	10		99	70	130			
1,1,1,2-Tetrachloroethane	10.2	1	10		102	70	130			
Chlorobenzene	9.8	1	10		98	70	130			
Ethylbenzene	10.7	0.5	10		107	70	130			
m,p-Xylene	10.5	0.5	10		105	70	130			
Bromoform	8.87	1	10		89	70	130			
Styrene	8.91	1	10		89	70	130			
o-Xylene	10.4	0.5	10		104	70	130			
1,1,2,2-Tetrachloroethane	9.34	1	10		93	70	130			
1,2,3-Trichloropropane	20.1	2	20		100	70	130			
Isopropylbenzene	9.43	1	10		94	70	130			
Bromobenzene	9.66	1	10		97	70	130			
n-Propylbenzene	9.73	1	10		97	70	130			
4-Chlorotoluene	9.38	1	10		94	70	130			
2-Chlorotoluene	9.35	1	10		94	70	130			
1,3,5-Trimethylbenzene	9.99	1	10		99.9	70	130			
tert-Butylbenzene	9.69	1	10		97	70	130			
1,2,4-Trimethylbenzene	10	1	10		100	70	130			
sec-Butylbenzene	9.58	1	10		96	70	130			
1,3-Dichlorobenzene	10.1	1	10		101	70	130			
1,4-Dichlorobenzene	9.38	1	10		94	70	130			
4-Isopropyltoluene	10	1	10		100	70	130			
1,2-Dichlorobenzene	9.23	1	10		92	70	130			
n-Butylbenzene	10.3	1	10		103	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	47	3	50		94	67	130			
1,2,4-Trichlorobenzene	8.89	2	10		89	70	130			
Naphthalene	7.8	2	10		78	70	130			
Hexachlorobutadiene	20.5	2	20		103	70	130			
1,2,3-Trichlorobenzene	8.97	2	10		90	70	130			
Surr: 1,2-Dichloroethane-d4	10.3		10		103	70	130			
Surr: Toluene-d8	9.67		10		97	70	130			





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

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

**Date:**

*19-Sep-11*

## QC Summary Report

**Work Order:**

11090622

Surr: 4-Bromofluorobenzene

9.06

10

91

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:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

### Sample Matrix Spike

Type: MS Test Code: EPA Method SW8260B

File ID: 11090707.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 11:02

Sample ID: 11090105-01AMS

Units: µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 11:02

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	43.9	2.5	50	0	88	21	138			
Chloromethane	57.2	10	50	0	114	23	144			
Vinyl chloride	58.5	2.5	50	0	117	49	136			
Chloroethane	56.9	2.5	50	0	114	21	159			
Bromomethane	46	10	50	0	92	10	174			
Trichlorofluoromethane	65	2.5	50	0	130	32	154			
1,1-Dichloroethene	46.5	2.5	50	0	93	64	130			
Dichloromethane	44.9	10	50	0	90	69	130			
Freon-113	52.6	2.5	50	0	105	55	141			
trans-1,2-Dichloroethene	47.3	2.5	50	0	95	63	130			
Methyl tert-butyl ether (MTBE)	45.9	1.3	50	0	92	47	150			
1,1-Dichloroethane	47.1	2.5	50	0	94	66	130			
2-Butanone (MEK)	852	50	1000	0	85	23	182			
cis-1,2-Dichloroethene	47.7	2.5	50	0	95	70	130			
Bromochloromethane	49.1	2.5	50	0	98	70	132			
Chloroform	49.1	2.5	50	0	98	70	130			
2,2-Dichloropropane	47.9	2.5	50	0	96	38	154			
1,2-Dichloroethane	49.6	2.5	50	0	99	65	134			
1,1,1-Trichloroethane	49.2	2.5	50	0	98	65	136			
1,1-Dichloropropene	50.6	2.5	50	0	101	68	132			
Carbon tetrachloride	49.3	2.5	50	0	99	58	148			
Benzene	49.1	1.3	50	0	98	59	138			
Dibromomethane	49.2	2.5	50	0	98	70	130			
1,2-Dichloropropane	46.8	2.5	50	0	94	70	131			
Trichloroethene	48.7	2.5	50	0	97	65	144			
Bromodichloromethane	49.1	2.5	50	0	98	50	157			
4-Methyl-2-pentanone (MIBK)	123	13	125	0	98	20	182			
cis-1,3-Dichloropropene	46.1	2.5	50	0	92	63	131			
trans-1,3-Dichloropropene	43.3	2.5	50	0	87	65	136			
1,1,2-Trichloroethane	49.2	2.5	50	0	98	70	131			
Toluene	48	1.3	50	0	96	68	130			
1,3-Dichloropropane	45.7	2.5	50	0	91	70	130			
Dibromochloromethane	42.5	2.5	50	0	85	42	155			
1,2-Dibromoethane (EDB)	93.6	5	100	0	94	70	130			
Tetrachloroethene	48.5	2.5	50	0	97	65	130			
1,1,1,2-Tetrachloroethane	48.8	2.5	50	0	98	70	130			
Chlorobenzene	47.4	2.5	50	0	95	70	130			
Ethylbenzene	51.5	1.3	50	0	103	68	130			
m,p-Xylene	50	1.3	50	0	100	68	131			
Bromoform	41.2	2.5	50	0	82	65	143			
Styrene	42.6	2.5	50	0	85	59	153			
o-Xylene	50	1.3	50	0	100	70	130			
1,1,2,2-Tetrachloroethane	43.7	2.5	50	0	87	67	130			
1,2,3-Trichloropropane	94.3	10	100	0	94	70	130			
Isopropylbenzene	46	2.5	50	0	92	55	138			
Bromobenzene	47.5	2.5	50	0	95	70	130			
n-Propylbenzene	48.1	2.5	50	0	96	67	133			
4-Chlorotoluene	45.8	2.5	50	0	92	70	130			
2-Chlorotoluene	45.6	2.5	50	0	91	70	130			
1,3,5-Trimethylbenzene	49.3	2.5	50	0	99	67	134			
tert-Butylbenzene	47.5	2.5	50	0	95	55	147			
1,2,4-Trimethylbenzene	49.1	2.5	50	0	98	65	135			
sec-Butylbenzene	47.2	2.5	50	0	94	68	135			
1,3-Dichlorobenzene	49.7	2.5	50	0	99	70	130			
1,4-Dichlorobenzene	45.6	2.5	50	0	91	70	130			
4-Isopropyltoluene	49.5	2.5	50	0	99	68	132			
1,2-Dichlorobenzene	44.8	2.5	50	0	90	70	130			
n-Butylbenzene	51.3	2.5	50	0	103	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	220	15	250	0	88	64	130			
1,2,4-Trichlorobenzene	45	10	50	0	90	62	133			
Naphthalene	38.7	10	50	0	77	32	166			
Hexachlorobutadiene	106	10	100	0	106	63	130			
1,2,3-Trichlorobenzene	45.5	10	50	0	91	55	138			
Surr: 1,2-Dichloroethane-d4	52.4		50		105	70	130			
Surr: Toluene-d8	48.2		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:**

*19-Sep-11*

## QC Summary Report

**Work Order:**

11090622

Surr: 4-Bromofluorobenzene

44.9

50

90

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:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

### Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8260B

File ID: 11090708.D

Batch ID: MS15W0907M

Analysis Date: 09/07/2011 11:24

Sample ID: 11090105-01AMSD

Units : µg/L

Run ID: MSD\_15\_110907B

Prep Date: 09/07/2011 11:24

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	51.4	2.5	50	0	103	21	138	43.89	15.7(33)	
Chloromethane	65	10	50	0	130	23	144	57.18	12.9(27)	
Vinyl chloride	68	2.5	50	0	136	49	136	58.49	15.1(21)	
Chloroethane	65.6	2.5	50	0	131	21	159	56.85	14.3(40)	
Bromomethane	54.6	10	50	0	109	10	174	46.03	17.1(40)	
Trichlorofluoromethane	73.5	2.5	50	0	147	32	154	64.96	12.3(37)	
1,1-Dichloroethene	53.5	2.5	50	0	107	64	130	46.48	14.0(21)	
Dichloromethane	51.7	10	50	0	103	69	130	44.85	14.1(20)	
Freon-113	59.7	2.5	50	0	119	55	141	52.58	12.6(40)	
trans-1,2-Dichloroethene	54.6	2.5	50	0	109	63	130	47.34	14.3(20)	
Methyl tert-butyl ether (MTBE)	57.2	1.3	50	0	114	47	150	45.89	21.9(40)	
1,1-Dichloroethane	54.3	2.5	50	0	109	66	130	47.12	14.1(20)	
2-Butanone (MEK)	1030	50	1000	0	103	23	182	851.7	19.1(22)	
cis-1,2-Dichloroethene	55.4	2.5	50	0	111	70	130	47.67	15.0(20)	
Bromochloromethane	57.4	2.5	50	0	115	70	132	49.1	15.5(20)	
Chloroform	56.7	2.5	50	0	113	70	130	49.06	14.4(20)	
2,2-Dichloropropane	56.5	2.5	50	0	113	38	154	47.87	16.6(22)	
1,2-Dichloroethane	58.1	2.5	50	0	116	65	134	49.59	15.9(20)	
1,1,1-Trichloroethane	57.7	2.5	50	0	115	65	136	49.22	15.9(20)	
1,1-Dichloropropene	58.3	2.5	50	0	117	68	132	50.63	14.2(20)	
Carbon tetrachloride	57.7	2.5	50	0	115	58	148	49.25	15.8(20)	
Benzene	56	1.3	50	0	112	59	138	49.08	13.2(21)	
Dibromomethane	58.3	2.5	50	0	117	70	130	49.18	16.9(20)	
1,2-Dichloropropane	54	2.5	50	0	108	70	131	46.83	14.2(20)	
Trichloroethene	55.3	2.5	50	0	111	65	144	48.7	12.7(20)	
Bromodichloromethane	57.4	2.5	50	0	115	50	157	49.11	15.5(20)	
4-Methyl-2-pentanone (MIBK)	152	13	125	0	122	20	182	123	21.3(20)	R5
cis-1,3-Dichloropropene	53.7	2.5	50	0	107	63	131	46.09	15.3(20)	
trans-1,3-Dichloropropene	51.2	2.5	50	0	102	65	136	43.3	16.7(20)	
1,1,2-Trichloroethane	57.6	2.5	50	0	115	70	131	49.2	15.7(20)	
Toluene	54.5	1.3	50	0	109	68	130	47.98	12.8(20)	
1,3-Dichloropropane	54	2.5	50	0	108	70	130	45.68	16.7(20)	
Dibromochloromethane	50.1	2.5	50	0	100	42	155	42.52	16.4(20)	
1,2-Dibromoethane (EDB)	110	5	100	0	110	70	130	93.57	16.1(20)	
Tetrachloroethene	56	2.5	50	0	112	65	130	48.5	14.3(20)	
1,1,1,2-Tetrachloroethane	56	2.5	50	0	112	70	130	48.84	13.7(20)	
Chlorobenzene	53.2	2.5	50	0	106	70	130	47.36	11.7(20)	
Ethylbenzene	58.3	1.3	50	0	117	68	130	51.5	12.3(20)	
m,p-Xylene	56.8	1.3	50	0	114	68	131	50.04	12.7(20)	
Bromoform	50.8	2.5	50	0	102	65	143	41.22	20.8(20)	R5
Styrene	48.7	2.5	50	0	97	59	153	42.62	13.4(37)	
o-Xylene	56.6	1.3	50	0	113	70	130	50.03	12.3(20)	
1,1,2,2-Tetrachloroethane	52.7	2.5	50	0	105	67	130	43.7	18.6(20)	
1,2,3-Trichloropropane	112	10	100	0	112	70	130	94.34	17.2(20)	
Isopropylbenzene	50.8	2.5	50	0	102	55	138	45.97	10.0(20)	
Bromobenzene	52.5	2.5	50	0	105	70	130	47.48	10.1(20)	
n-Propylbenzene	52.6	2.5	50	0	105	67	133	48.14	8.8(30)	
4-Chlorotoluene	51.2	2.5	50	0	102	70	130	45.79	11.1(20)	
2-Chlorotoluene	50.8	2.5	50	0	102	70	130	45.59	10.8(20)	
1,3,5-Trimethylbenzene	54.6	2.5	50	0	109	67	134	49.27	10.2(21)	
tert-Butylbenzene	53	2.5	50	0	106	55	147	47.5	10.9(20)	
1,2,4-Trimethylbenzene	54.8	2.5	50	0	110	65	135	49.14	11.0(25)	
sec-Butylbenzene	52.3	2.5	50	0	105	68	135	47.15	10.4(20)	
1,3-Dichlorobenzene	55.9	2.5	50	0	112	70	130	49.69	11.7(20)	
1,4-Dichlorobenzene	51.3	2.5	50	0	103	70	130	45.63	11.8(20)	
4-Isopropyltoluene	54.8	2.5	50	0	110	68	132	49.51	10.2(20)	
1,2-Dichlorobenzene	51.2	2.5	50	0	102	70	130	44.79	13.4(20)	
n-Butylbenzene	57.5	2.5	50	0	115	62	134	51.29	11.3(21)	
1,2-Dibromo-3-chloropropane (DBCP)	274	15	250	0	110	64	130	220.3	21.8(20)	R5
1,2,4-Trichlorobenzene	55.2	10	50	0	110	62	133	44.96	20.4(29)	
Naphthalene	50.7	10	50	0	101	32	166	38.71	26.8(40)	
Hexachlorobutadiene	126	10	100	0	126	63	130	105.8	17.7(21)	
1,2,3-Trichlorobenzene	57.7	10	50	0	115	55	138	45.5	23.7(36)	
Surr: 1,2-Dichloroethane-d4	54.3		50		109	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:  
19-Sep-11

## QC Summary Report

Work Order:  
11090622

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Surr: Toluene-d8	47.9	50	96	70	130
Surr: 4-Bromofluorobenzene	44.5	50	89	70	130

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### 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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

R5 = MS/MSD RPD exceeded the laboratory control limit. Recovery met acceptance criteria.

**Billing Information :**

**CHAIN-OF-CUSTODY RECORD**

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

**CA**

**WorkOrder : BMIS11090622**  
**Report Due By : 5:00 PM On : 19-Sep-11**

**Client:**  
 Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215

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

Client's COC # : 25564 Job : 100006114/JPL Groundwater Monitoring  
 QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Collection Date	No. of Bottles Alpha Sub TAT	Requested Tests				Sample Remarks
				314_W	METALS_D W	VOC_TIC_W	VOC_W	
BMI11090622-01A	NMW-20-5	09/02/11 08:46	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-02A	NMW-20-4	09/02/11 09:20	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-03A	NMW-20-3	09/02/11 09:47	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-04A	NMW-20-2	09/02/11 10:12	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-05A	NMW-20-1	09/02/11 10:33	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-06A	DUPE-04-3Q11	09/02/11 00:00	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-07A	EB-09-09/02/11	09/02/11 10:23	5 0 9	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090622-08A	TB-09-09/02/11	09/02/11 07:00	1 0 9			VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 7/19/11

**Comments:** Security seals intact. Frozen ice. Saturday delivery. Samples kept cold and secure until login on Tuesday. Temp Blank #8404 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).

Logged in by: K Murray K Murray Alpha Analytical, Inc. 9/6/11 1040  
 Signature \_\_\_\_\_ Print Name \_\_\_\_\_ Company \_\_\_\_\_ Date/Time \_\_\_\_\_

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:**

Name BATTILLE / GERARD CONNER  
 Address 508 LIVING 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?** 25564  
 AZ  CA  NV  WA   
 ID  OR  OTHER   
 Page # 1 of 1

Analyses Required

Client Name BATTILLE / DAVID CONNER  
 Address 3490 OLD TOWN AVE C-245  
 City, State, Zip SWAN DIEGO, CA 92110

PO # 287215 Job # 10006114  
 Email Address CONNERD@BATTILLE.ORG Fax # 604) 458-6614  
 Phone # (619) 726-7311

Report Attention DAVID CONNER  
 Sample Description

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled By (Use Only)	Lab ID Number	Office (Use Only)	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOCs (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	Required QC Level?	EDD / EDF? YES NO	Global ID #	REMARKS
0846	9/21/11	AQ	BM111090632-01				MW - 20 - 5	NORM		S - VARIATIONS	X	X	X	I			
0920	9/21/11	AQ					MW - 20 - 4			S - VARIATIONS	X	X	X	II			
0947	9/21/11	AQ					MW - 20 - 3			S - VARIATIONS	X	X	X	III			
1012	9/21/11	AQ					MW - 20 - 2			S - VARIATIONS	X	X	X	IV			
1033	9/21/11	AQ					MW - 20 - 1			S - VARIATIONS	X	X	X				
	9/21/11	AQ					DUP - 04 - 3011			S - VARIATIONS	X	X	X				Duplicate
	9/21/11	AQ					06 DURE - 04 - 3011			S - VARIATIONS	X	X	X				Duplicate
1023	9/21/11	AQ					07 EB - 09 - 09/02/11			S - VARIATIONS	X	X	X				REAGENTS BLANK
0700	9/21/11	AQ					08 TB - 09 - 09/02/11			S - VARIATIONS	X	X	X				TIP BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CIGARETTE BURNER	ENVISIGHT SECURITY	9/21/11	1200
<i>[Signature]</i>	ANTHONY STERK	ENVISIGHT SECURITY	9/21/11	1200
<i>[Signature]</i>	KEMUNARY	ENVISIGHT SECURITY	9/21/11	1020

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Liter V-Vol S-Soil Jar O-Orho 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.



# Alpha Analytical, Inc.

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

Date: 21-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11090748

Cooler Temp: 1 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11090748-01A	MW-26-2	Aqueous
11090748-02A	MW-26-1	Aqueous
11090748-03A	MW-25-5	Aqueous
11090748-04A	MW-25-4	Aqueous
11090748-05A	MW-25-3	Aqueous
11090748-06A	MW-25-2	Aqueous
11090748-07A	MW-25-1	Aqueous
11090748-08A	DUPE-05-3Q11	Aqueous
11090748-09A	EB-10-09/06/11	Aqueous
11090748-10A	TB-10-09/06/11	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11090748-02A	EPA Method 314.0	Perchlorate
11090748-04A	EPA Method 314.0	Perchlorate
11090748-05A	EPA Method 314.0	Perchlorate
11090748-06A	EPA Method 314.0	Perchlorate
11090748-07A	EPA Method 314.0	Perchlorate
11090748-08A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.





# 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

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/07/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-26-2</b> Lab ID : BM111090748-01A Perchlorate Date Sampled 09/06/11 09:17	ND	1.00 µg/L	09/19/11 12:28	09/19/11 13:47
Client ID: <b>MW-26-1</b> Lab ID : BM111090748-02A Perchlorate Date Sampled 09/06/11 09:36	2.19	1.00 µg/L	09/19/11 12:28	09/19/11 15:37
Client ID: <b>MW-25-5</b> Lab ID : BM111090748-03A Perchlorate Date Sampled 09/06/11 10:50	ND	1.00 µg/L	09/19/11 12:28	09/19/11 15:56
Client ID: <b>MW-25-4</b> Lab ID : BM111090748-04A Perchlorate Date Sampled 09/06/11 11:17	7.61	1.00 µg/L	09/19/11 12:28	09/19/11 16:14
Client ID: <b>MW-25-3</b> Lab ID : BM111090748-05A Perchlorate Date Sampled 09/06/11 11:42	9.08	1.00 µg/L	09/19/11 12:28	09/19/11 16:33
Client ID: <b>MW-25-2</b> Lab ID : BM111090748-06A Perchlorate Date Sampled 09/06/11 12:10	13.3	1.00 µg/L	09/19/11 12:28	09/19/11 17:09
Client ID: <b>MW-25-1</b> Lab ID : BM111090748-07A Perchlorate Date Sampled 09/06/11 12:31	8.30	1.00 µg/L	09/19/11 12:28	09/19/11 17:28
Client ID: <b>DUPE-05-3Q11</b> Lab ID : BM111090748-08A Perchlorate Date Sampled 09/06/11 00:00	13.2	1.00 µg/L	09/19/11 12:28	09/19/11 17:46
Client ID: <b>EB-10-09/06/11</b> Lab ID : BM111090748-09A Perchlorate Date Sampled 09/06/11 09:45	ND	1.00 µg/L	09/19/11 18:05	09/19/11 18:05



# Alpha Analytical, Inc.

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---

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

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*PS*

9/21/11

**Report Date**



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/07/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-26-2</b> Lab ID : BMI11090748-01A Chromium (Cr) Date Sampled 09/06/11 09:17	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-26-1</b> Lab ID : BMI11090748-02A Chromium (Cr) Date Sampled 09/06/11 09:36	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-5</b> Lab ID : BMI11090748-03A Chromium (Cr) Date Sampled 09/06/11 10:50	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-4</b> Lab ID : BMI11090748-04A Chromium (Cr) Date Sampled 09/06/11 11:17	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-3</b> Lab ID : BMI11090748-05A Chromium (Cr) Date Sampled 09/06/11 11:42	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-2</b> Lab ID : BMI11090748-06A Chromium (Cr) Date Sampled 09/06/11 12:10	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-1</b> Lab ID : BMI11090748-07A Chromium (Cr) Date Sampled 09/06/11 12:31	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>DUPE-05-3Q11</b> Lab ID : BMI11090748-08A Chromium (Cr) Date Sampled 09/06/11 00:00	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>EB-10-09/06/11</b> Lab ID : BMI11090748-09A Chromium (Cr) Date Sampled 09/06/11 09:45	ND	0.0050 mg/L	10/24/11	10/24/11



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---

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) 281-4848 / Carson, CA • (714) 386-2901 / [info@alpha-analytical.com](mailto:info@alpha-analytical.com)

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

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10/25/11

**Report Date**



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

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

Job: 100006114/JPL Groundwater Monitoring

### Tentatively Identified Compounds - Volatile Organics by GC/MS

	Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-26-2</b>					
Lab ID : BMI11090748-01A	*** None Found ***	ND	2.0 µg/L	09/15/11 12:37	09/15/11 12:37
Date Received : 09/07/11					
Date Sampled : 09/06/11 09:17					
Client ID : <b>MW-26-1</b>					
Lab ID : BMI11090748-02A	*** None Found ***	ND	2.0 µg/L	09/15/11 12:58	09/15/11 12:58
Date Received : 09/07/11					
Date Sampled : 09/06/11 09:36					
Client ID : <b>MW-25-5</b>					
Lab ID : BMI11090748-03A	Sulfur dioxide	14	2.0 µg/L	09/15/11 13:20	09/15/11 13:20
Date Received : 09/07/11					
Date Sampled : 09/06/11 10:50					
Client ID : <b>MW-25-4</b>					
Lab ID : BMI11090748-04A	*** None Found ***	ND	2.0 µg/L	09/15/11 13:41	09/15/11 13:41
Date Received : 09/07/11					
Date Sampled : 09/06/11 11:17					
Client ID : <b>MW-25-3</b>					
Lab ID : BMI11090748-05A	*** None Found ***	ND	2.0 µg/L	09/15/11 14:03	09/15/11 14:03
Date Received : 09/07/11					
Date Sampled : 09/06/11 11:42					
Client ID : <b>MW-25-2</b>					
Lab ID : BMI11090748-06A	*** None Found ***	ND	2.0 µg/L	09/15/11 14:24	09/15/11 14:24
Date Received : 09/07/11					
Date Sampled : 09/06/11 12:10					
Client ID : <b>MW-25-1</b>					
Lab ID : BMI11090748-07A	*** None Found ***	ND	2.0 µg/L	09/15/11 14:46	09/15/11 14:46
Date Received : 09/07/11					
Date Sampled : 09/06/11 12:31					
Client ID : <b>DUPE-05-3Q11</b>					
Lab ID : BMI11090748-08A	*** None Found ***	ND	2.0 µg/L	09/15/11 15:08	09/15/11 15:08
Date Received : 09/07/11					
Date Sampled : 09/06/11 00:00					
Client ID : <b>EB-10-09/06/11</b>					
Lab ID : BMI11090748-09A	*** None Found ***	ND	2.0 µg/L	09/15/11 11:53	09/15/11 11:53
Date Received : 09/07/11					
Date Sampled : 09/06/11 09:45					



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Client ID : **TB-10-09/06/11**  
Lab ID : BMI11090748-10A    \*\*\* None Found \*\*\*    ND    2.0 µg/L    09/15/11 12:15    09/15/11 12:15  
Date Received : 09/07/11  
Date Sampled : 09/06/11 07:30

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

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*PS*

9/21/11

**Report Date**

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-01A  
Client I.D. Number: MW-26-2

Sampled: 09/06/11 09:17  
Received: 09/07/11  
Extracted: 09/15/11 12:37  
Analyzed: 09/15/11 12:37

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date

Page 1 of 1



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-02A  
Client I.D. Number: MW-26-1

Sampled: 09/06/11 09:36  
Received: 09/07/11  
Extracted: 09/15/11 12:58  
Analyzed: 09/15/11 12:58

### 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-Dichloroethane	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	0.62	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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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	1.6	0.50 µg/L			

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date





# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway

San Diego, CA 92101

Job: 100006114/JPL Groundwater Monitoring

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

Alpha Analytical Number: BMI11090748-03A

Client I.D. Number: MW-25-5

Sampled: 09/06/11 10:50

Received: 09/07/11

Extracted: 09/15/11 13:20

Analyzed: 09/15/11 13:20

### 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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 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

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9/21/11

Report Date

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-04A  
Client I.D. Number: MW-25-4

Sampled: 09/06/11 11:17  
Received: 09/07/11  
Extracted: 09/15/11 13:41  
Analyzed: 09/15/11 13:41

### 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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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  
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*AS*  
9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-05A  
Client I.D. Number: MW-25-3

Sampled: 09/06/11 11:42  
Received: 09/07/11  
Extracted: 09/15/11 14:03  
Analyzed: 09/15/11 14:03

### 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	0.59	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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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 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

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9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-06A  
Client I.D. Number: MW-25-2

Sampled: 09/06/11 12:10  
Received: 09/07/11  
Extracted: 09/15/11 14:24  
Analyzed: 09/15/11 14:24

### 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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-07A  
Client I.D. Number: MW-25-1

Sampled: 09/06/11 12:31  
Received: 09/07/11  
Extracted: 09/15/11 14:46  
Analyzed: 09/15/11 14:46

### 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	0.56	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	6.4	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	118	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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Report Date



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-08A  
Client I.D. Number: DUPE-05-3Q11

Sampled: 09/06/11 00:00  
Received: 09/07/11  
Extracted: 09/15/11 15:08  
Analyzed: 09/15/11 15:08

### 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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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.

*[Signature]*  
9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-09A  
Client I.D. Number: EB-10-09/06/11

Sampled: 09/06/11 09:45  
Received: 09/07/11  
Extracted: 09/15/11 11:53  
Analyzed: 09/15/11 11:53

### 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	110	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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.

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9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090748-10A  
Client I.D. Number: TB-10-09/06/11

Sampled: 09/06/11 07:30  
Received: 09/07/11  
Extracted: 09/15/11 12:15  
Analyzed: 09/15/11 12:15

### 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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date

Page 1 of 1





# Alpha Analytical, Inc.

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

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

## VOC Sample Preservation Report

**Work Order:** BMI11090748

**Job:** 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11090748-01A	MW-26-2	Aqueous	2
11090748-02A	MW-26-1	Aqueous	2
11090748-03A	MW-25-5	Aqueous	2
11090748-04A	MW-25-4	Aqueous	2
11090748-05A	MW-25-3	Aqueous	2
11090748-06A	MW-25-2	Aqueous	2
11090748-07A	MW-25-1	Aqueous	2
11090748-08A	DUPE-05-3Q11	Aqueous	2
11090748-09A	EB-10-09/06/11	Aqueous	2
11090748-10A	TB-10-09/06/11	Aqueous	2

9/21/11

Report Date

Page 1 of 1



# Alpha Analytical, Inc.

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

Date:  
22-Sep-11

## QC Summary Report

Work Order:  
11090748

### Method Blank

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

File ID: <b>16</b>				Batch ID: <b>27340</b>				Analysis Date: <b>09/19/2011 12:52</b>		
Sample ID: <b>MB-27340</b>	Units : <b>µg/L</b>			Run ID: <b>IC_3_110919A</b>				Prep Date: <b>09/19/2011 12:28</b>		
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: <b>17</b>				Batch ID: <b>27340</b>				Analysis Date: <b>09/19/2011 13:10</b>		
Sample ID: <b>LFB-27340</b>	Units : <b>µg/L</b>			Run ID: <b>IC_3_110919A</b>				Prep Date: <b>09/19/2011 12:28</b>		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	25.8	2	25		103	85	115			

### Sample Matrix Spike

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

File ID: <b>20</b>				Batch ID: <b>27340</b>				Analysis Date: <b>09/19/2011 14:05</b>		
Sample ID: <b>11090748-01ALFM</b>	Units : <b>µg/L</b>			Run ID: <b>IC_3_110919A</b>				Prep Date: <b>09/19/2011 12:28</b>		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.7	2	25	0	95	80	120			

### Sample Matrix Spike Duplicate

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

File ID: <b>21</b>				Batch ID: <b>27340</b>				Analysis Date: <b>09/19/2011 14:24</b>		
Sample ID: <b>11090748-01ALFMD</b>	Units : <b>µg/L</b>			Run ID: <b>IC_3_110919A</b>				Prep Date: <b>09/19/2011 12:28</b>		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	25.1	2	25	0	100	80	120	23.7	5.8(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.



# Alpha Analytical, Inc.

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

Date: 25-Oct-11 **QC Summary Report** Work Order: 11090748

### Method Blank

File ID:	Type	Test Code:								
102411.B\016_M.D\	MBLK	EPA Method 200.8								
Sample ID: MB-27531	Units : mg/L	Batch ID: 27531	Run ID: ICP/MS_111024A		Analysis Date: 10/24/2011 15:04		Prep Date: 10/24/2011 14:30			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								

### Laboratory Control Spike

File ID:	Type	Test Code:								
102411.B\017_M.D\	LCS	EPA Method 200.8								
Sample ID: LCS-27531	Units : mg/L	Batch ID: 27531	Run ID: ICP/MS_111024A		Analysis Date: 10/24/2011 15:10		Prep Date: 10/24/2011 14:30			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0479	0.005	0.05		96	85	115			

### Sample Matrix Spike

File ID:	Type	Test Code:								
102411.B\022_M.D\	MS	EPA Method 200.8								
Sample ID: 11090748-01AMS	Units : mg/L	Batch ID: 27531	Run ID: ICP/MS_111024A		Analysis Date: 10/24/2011 15:39		Prep Date: 10/24/2011 14:30			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0501	0.005	0.05		0	100	70	130		

### Sample Matrix Spike Duplicate

File ID:	Type	Test Code:								
102411.B\023_M.D\	MSD	EPA Method 200.8								
Sample ID: 11090748-01AMSD	Units : mg/L	Batch ID: 27531	Run ID: ICP/MS_111024A		Analysis Date: 10/24/2011 15:45		Prep Date: 10/24/2011 14:30			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.0439	0.005	0.05		0	88	70	130	0.05012	13.2(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.



# Alpha Analytical, Inc.

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

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

Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

### Method Blank

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

File ID: **11091506.D**

Batch ID: **MS15W0915M**

Analysis Date: **09/15/2011 10:49**

Sample ID: **MBLK MS15W0915M**

Units: **µg/L**

Run ID: **MSD\_15\_110915B**

Prep Date: **09/15/2011 10:49**

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	10.5		10		105	70	130			
Surr: Toluene-d8	9.85		10		99	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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

Surr: 4-Bromofluorobenzene

8.95

10

90

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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

### Laboratory Control Spike

Type LCS Test Code: EPA Method SW8260B

File ID: 11091503.D

Batch ID: MS15W0915M

Analysis Date: 09/15/2011 09:44

Sample ID: LCS MS15W0915M

Units: µg/L

Run ID: MSD\_15\_110915B

Prep Date: 09/15/2011 09:44

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	7.36	1	10		74	70	130			
Chloromethane	11.5	2	10		115	70	130			
Vinyl chloride	9.53	1	10		95	70	130			
Chloroethane	11.1	1	10		111	70	130			
Bromomethane	8.35	2	10		84	70	130			
Trichlorofluoromethane	11.5	1	10		115	70	130			
1,1-Dichloroethene	10	1	10		100	70	130			
Dichloromethane	10.1	2	10		101	70	130			
Freon-113	11.4	1	10		114	70	137			
trans-1,2-Dichloroethene	10.4	1	10		104	70	130			
Methyl tert-butyl ether (MTBE)	11.7	0.5	10		117	70	130			
1,1-Dichloroethane	10.5	1	10		105	70	130			
2-Butanone (MEK)	301	10	200		150	70	130(130)			L51
cis-1,2-Dichloroethene	10.6	1	10		106	70	130			
Bromochloromethane	11.3	1	10		113	70	130			
Chloroform	11	1	10		110	70	130			
2,2-Dichloropropane	11	1	10		110	70	130			
1,2-Dichloroethane	11.8	1	10		118	70	130			
1,1,1-Trichloroethane	10.9	1	10		109	70	130			
1,1-Dichloropropene	11.3	1	10		113	70	130			
Carbon tetrachloride	10.1	1	10		101	70	130			
Benzene	10.8	0.5	10		108	70	130			
Dibromomethane	11.4	1	10		114	70	130			
1,2-Dichloropropane	10.6	1	10		106	70	130			
Trichloroethene	10.9	1	10		109	70	130			
Bromodichloromethane	9.99	1	10		99.9	70	130			
4-Methyl-2-pentanone (MIBK)	32.9	2.5	25		131	20	182			
cis-1,3-Dichloropropene	10.6	1	10		106	70	130			
trans-1,3-Dichloropropene	9.93	1	10		99	70	130			
1,1,2-Trichloroethane	11.4	1	10		114	70	130			
Toluene	10.6	0.5	10		106	70	130			
1,3-Dichloropropane	10.8	1	10		108	70	130			
Dibromochloromethane	8.11	1	10		81	70	130			
1,2-Dibromoethane (EDB)	21.9	2	20		109	70	130			
Tetrachloroethene	10.7	1	10		107	70	130			
1,1,1,2-Tetrachloroethane	10.3	1	10		103	70	130			
Chlorobenzene	10.4	1	10		104	70	130			
Ethylbenzene	11.1	0.5	10		111	70	130			
m,p-Xylene	11	0.5	10		110	70	130			
Bromoform	7.57	1	10		76	70	130			
Styrene	9.59	1	10		96	70	130			
o-Xylene	11	0.5	10		110	70	130			
1,1,2,2-Tetrachloroethane	10.4	1	10		104	70	130			
1,2,3-Trichloropropane	23.1	2	20		115	70	130			
Isopropylbenzene	9.75	1	10		98	70	130			
Bromobenzene	10.3	1	10		103	70	130			
n-Propylbenzene	10.1	1	10		101	70	130			
4-Chlorotoluene	9.97	1	10		99.7	70	130			
2-Chlorotoluene	9.73	1	10		97	70	130			
1,3,5-Trimethylbenzene	10.3	1	10		103	70	130			
tert-Butylbenzene	9.91	1	10		99	70	130			
1,2,4-Trimethylbenzene	10.4	1	10		104	70	130			
sec-Butylbenzene	9.81	1	10		98	70	130			
1,3-Dichlorobenzene	10.8	1	10		108	70	130			
1,4-Dichlorobenzene	10	1	10		100	70	130			
4-Isopropyltoluene	10.2	1	10		102	70	130			
1,2-Dichlorobenzene	10	1	10		100	70	130			
n-Butylbenzene	10.6	1	10		106	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	49	3	50		98	67	130			
1,2,4-Trichlorobenzene	10.5	2	10		105	70	130			
Naphthalene	10.2	2	10		102	70	130			
Hexachlorobutadiene	19.9	2	20		99	70	130			
1,2,3-Trichlorobenzene	11	2	10		110	70	130			
Surr: 1,2-Dichloroethane-d4	11.2		10		112	70	130			
Surr: Toluene-d8	9.62		10		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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

Surr: 4-Bromofluorobenzene

9.3

10

93

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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

### Sample Matrix Spike

File ID: 11091528.D

Type MS

Test Code: EPA Method SW8260B

Batch ID: MS15W0915M

Analysis Date: 09/15/2011 18:43

Sample ID: 11090748-01AMS

Units: µg/L

Run ID: MSD\_15\_110915B

Prep Date: 09/15/2011 18:43

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	42.8	2.5	50	0	86	21	138			
Chloromethane	53.6	10	50	0	107	23	144			
Vinyl chloride	53.9	2.5	50	0	108	49	136			
Chloroethane	47.1	2.5	50	0	94	21	159			
Bromomethane	34.8	10	50	0	70	10	174			
Trichlorofluoromethane	49.9	2.5	50	0	99.7	32	154			
1,1-Dichloroethene	43.5	2.5	50	0	87	64	130			
Dichloromethane	45.4	10	50	0	91	69	130			
Freon-113	50.7	2.5	50	0	101	55	141			
trans-1,2-Dichloroethene	46.1	2.5	50	0	92	63	130			
Methyl tert-butyl ether (MTBE)	53.4	1.3	50	0	107	47	150			
1,1-Dichloroethane	46.5	2.5	50	0	93	66	130			
2-Butanone (MEK)	982	50	1000	0	98	23	182			
cis-1,2-Dichloroethene	46.4	2.5	50	0	93	70	130			
Bromochloromethane	50	2.5	50	0	100	70	132			
Chloroform	48.3	2.5	50	0	97	70	130			
2,2-Dichloropropane	40.3	2.5	50	0	81	38	154			
1,2-Dichloroethane	52.9	2.5	50	0	106	65	134			
1,1,1-Trichloroethane	47.6	2.5	50	0	95	65	136			
1,1-Dichloropropene	49.6	2.5	50	0	99	68	132			
Carbon tetrachloride	43.2	2.5	50	0	86	58	148			
Benzene	47.4	1.3	50	0	95	59	138			
Dibromomethane	51.8	2.5	50	0	104	70	130			
1,2-Dichloropropane	46.3	2.5	50	0	93	70	131			
Trichloroethene	46.4	2.5	50	0	93	65	144			
Bromodichloromethane	45.1	2.5	50	0	90	50	157			
4-Methyl-2-pentanone (MIBK)	142	13	125	0	114	20	182			
cis-1,3-Dichloropropene	42.6	2.5	50	0	85	63	131			
trans-1,3-Dichloropropene	42.3	2.5	50	0	85	65	136			
1,1,2-Trichloroethane	51.9	2.5	50	0	104	70	131			
Toluene	44.6	1.3	50	0	89	68	130			
1,3-Dichloropropane	48	2.5	50	0	96	70	130			
Dibromochloromethane	37.1	2.5	50	0	74	42	155			
1,2-Dibromoethane (EDB)	96.1	5	100	0	96	70	130			
Tetrachloroethene	44.7	2.5	50	0	89	65	130			
1,1,1,2-Tetrachloroethane	44.7	2.5	50	0	89	70	130			
Chlorobenzene	45.4	2.5	50	0	91	70	130			
Ethylbenzene	48.2	1.3	50	0	96	68	130			
m,p-Xylene	47.2	1.3	50	0	94	68	131			
Bromoform	35.2	2.5	50	0	70	65	143			
Styrene	40.9	2.5	50	0	82	59	153			
o-Xylene	47.7	1.3	50	0	95	70	130			
1,1,2,2-Tetrachloroethane	47.8	2.5	50	0	96	67	130			
1,2,3-Trichloropropane	105	10	100	0	105	70	130			
Isopropylbenzene	41.7	2.5	50	0	83	55	138			
Bromobenzene	44.6	2.5	50	0	89	70	130			
n-Propylbenzene	43	2.5	50	0	86	67	133			
4-Chlorotoluene	42	2.5	50	0	84	70	130			
2-Chlorotoluene	42	2.5	50	0	84	70	130			
1,3,5-Trimethylbenzene	44.7	2.5	50	0	89	67	134			
tert-Butylbenzene	43.1	2.5	50	0	86	55	147			
1,2,4-Trimethylbenzene	44.5	2.5	50	0	89	65	135			
sec-Butylbenzene	42.6	2.5	50	0	85	68	135			
1,3-Dichlorobenzene	45.6	2.5	50	0	91	70	130			
1,4-Dichlorobenzene	42.5	2.5	50	0	85	70	130			
4-Isopropyltoluene	44.1	2.5	50	0	88	68	132			
1,2-Dichlorobenzene	42.8	2.5	50	0	86	70	130			
n-Butylbenzene	44.5	2.5	50	0	89	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	224	15	250	0	90	64	130			
1,2,4-Trichlorobenzene	41.8	10	50	0	84	62	133			
Naphthalene	44.4	10	50	0	89	32	166			
Hexachlorobutadiene	85.3	10	100	0	85	63	130			
1,2,3-Trichlorobenzene	45.8	10	50	0	92	55	138			
Surr: 1,2-Dichloroethane-d4	57.2		50		114	70	130			
Surr: Toluene-d8	46.7		50		93	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:**

*21-Sep-11*

## QC Summary Report

**Work Order:**

11090748

Surr: 4-Bromofluorobenzene

45.4

50

91

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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

### Sample Matrix Spike Duplicate

Type MSD Test Code: EPA Method SW8260B

File ID: 11091529.D

Batch ID: MS15W0915M

Analysis Date: 09/15/2011 19:05

Sample ID: 11090748-01AMSD

Units: µg/L

Run ID: MSD\_15\_110915B

Prep Date: 09/15/2011 19:05

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	44.9	2.5	50	0	90	21	138	42.8	4.7(33)	
Chloromethane	57.3	10	50	0	115	23	144	53.6	6.7(27)	
Vinyl chloride	55.9	2.5	50	0	112	49	136	53.92	3.6(21)	
Chloroethane	54.1	2.5	50	0	108	21	159	47.13	13.7(40)	
Bromomethane	42	10	50	0	84	10	174	34.75	18.8(40)	
Trichlorofluoromethane	58.2	2.5	50	0	116	32	154	49.86	15.5(37)	
1,1-Dichloroethene	46.3	2.5	50	0	93	64	130	43.52	6.3(21)	
Dichloromethane	46	10	50	0	92	69	130	45.36	1.4(20)	
Freon-113	52	2.5	50	0	104	55	141	50.73	2.4(40)	
trans-1,2-Dichloroethene	46.8	2.5	50	0	94	63	130	46.05	1.7(20)	
Methyl tert-butyl ether (MTBE)	55.6	1.3	50	0	111	47	150	53.42	3.9(40)	
1,1-Dichloroethane	47.7	2.5	50	0	95	66	130	46.54	2.5(20)	
2-Butanone (MEK)	1000	50	1000	0	100	23	182	981.9	1.9(22)	
cis-1,2-Dichloroethene	47.5	2.5	50	0	95	70	130	46.43	2.3(20)	
Bromochloromethane	52.2	2.5	50	0	104	70	132	50.04	4.2(20)	
Chloroform	50	2.5	50	0	100	70	130	48.3	3.5(20)	
2,2-Dichloropropane	42.2	2.5	50	0	84	38	154	40.26	4.7(22)	
1,2-Dichloroethane	54.3	2.5	50	0	109	65	134	52.87	2.7(20)	
1,1,1-Trichloroethane	49.6	2.5	50	0	99	65	136	47.59	4.2(20)	
1,1-Dichloropropene	50.7	2.5	50	0	101	68	132	49.59	2.1(20)	
Carbon tetrachloride	47.2	2.5	50	0	94	58	148	43.15	8.9(20)	
Benzene	48.7	1.3	50	0	97	59	138	47.44	2.5(21)	
Dibromomethane	54	2.5	50	0	108	70	130	51.8	4.1(20)	
1,2-Dichloropropane	47.8	2.5	50	0	96	70	131	46.34	3.2(20)	
Trichloroethene	48	2.5	50	0	96	65	144	46.42	3.4(20)	
Bromodichloromethane	48	2.5	50	0	96	50	157	45.07	6.3(20)	
4-Methyl-2-pentanone (MIBK)	148	13	125	0	119	20	182	142.2	4.1(20)	
cis-1,3-Dichloropropene	45.1	2.5	50	0	90	63	131	42.57	5.7(20)	
trans-1,3-Dichloropropene	44.3	2.5	50	0	89	65	136	42.25	4.7(20)	
1,1,2-Trichloroethane	53.1	2.5	50	0	106	70	131	51.9	2.3(20)	
Toluene	46.5	1.3	50	0	93	68	130	44.6	4.1(20)	
1,3-Dichloropropane	49.9	2.5	50	0	99.7	70	130	47.95	3.9(20)	
Dibromochloromethane	40.2	2.5	50	0	80	42	155	37.05	8.1(20)	
1,2-Dibromoethane (EDB)	101	5	100	0	101	70	130	96.08	4.6(20)	
Tetrachloroethene	46.2	2.5	50	0	92	65	130	44.65	3.5(20)	
1,1,1,2-Tetrachloroethane	47.3	2.5	50	0	95	70	130	44.74	5.6(20)	
Chlorobenzene	46.7	2.5	50	0	93	70	130	45.35	2.9(20)	
Ethylbenzene	49.7	1.3	50	0	99	68	130	48.21	3.1(20)	
m,p-Xylene	48.4	1.3	50	0	97	68	131	47.16	2.6(20)	
Bromoform	38.7	2.5	50	0	77	65	143	35.22	9.3(20)	
Styrene	42	2.5	50	0	84	59	153	40.88	2.6(37)	
o-Xylene	49	1.3	50	0	98	70	130	47.7	2.7(20)	
1,1,2,2-Tetrachloroethane	49.4	2.5	50	0	99	67	130	47.75	3.5(20)	
1,2,3-Trichloropropane	108	10	100	0	108	70	130	105.2	2.3(20)	
Isopropylbenzene	43.2	2.5	50	0	86	55	138	41.69	3.6(20)	
Bromobenzene	46.4	2.5	50	0	93	70	130	44.63	3.8(20)	
n-Propylbenzene	44.6	2.5	50	0	89	67	133	43.03	3.5(30)	
4-Chlorotoluene	43.5	2.5	50	0	87	70	130	42	3.6(20)	
2-Chlorotoluene	43.2	2.5	50	0	86	70	130	41.99	2.7(20)	
1,3,5-Trimethylbenzene	45.9	2.5	50	0	92	67	134	44.65	2.7(21)	
tert-Butylbenzene	44.7	2.5	50	0	89	55	147	43.07	3.7(20)	
1,2,4-Trimethylbenzene	46.1	2.5	50	0	92	65	135	44.47	3.5(25)	
sec-Butylbenzene	44	2.5	50	0	88	68	135	42.6	3.2(20)	
1,3-Dichlorobenzene	47.4	2.5	50	0	95	70	130	45.56	4.0(20)	
1,4-Dichlorobenzene	44.4	2.5	50	0	89	70	130	42.53	4.2(20)	
4-Isopropyltoluene	45.6	2.5	50	0	91	68	132	44.09	3.3(20)	
1,2-Dichlorobenzene	44.6	2.5	50	0	89	70	130	42.77	4.3(20)	
n-Butylbenzene	46.5	2.5	50	0	93	62	134	44.45	4.4(21)	
1,2-Dibromo-3-chloropropane (DBCP)	241	15	250	0	96	64	130	223.8	7.3(20)	
1,2,4-Trichlorobenzene	45	10	50	0	90	62	133	41.8	7.3(29)	
Naphthalene	46.3	10	50	0	93	32	166	44.35	4.2(40)	
Hexachlorobutadiene	90.7	10	100	0	91	63	130	85.28	6.2(21)	
1,2,3-Trichlorobenzene	49.2	10	50	0	98	55	138	45.83	7.0(36)	
Surr: 1,2-Dichloroethane-d4	56.9		50		114	70	130			
Surr: Toluene-d8	47.2		50		94	70	130			



# Alpha Analytical, Inc.

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

Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090748

Surr: 4-Bromofluorobenzene

45.4

50

91

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.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L51 = Analyte recovery was above acceptance limits for the LCS, but was acceptable in the MS/MSD.

Billing Information :

**CHAIN-OF-CUSTODY RECORD**

AMENDED  
**CA RUSH**

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

WorkOrder : BMIS11090748  
Report Due By : 5:00 PM On : 21-Sep-11  
*Amendment due : ASAP*

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@battelle.org  
Shane Walton (614) 424-4117 x waltonsh@battelle.org

EDD Required : No  
Sampled by : Chase Brogdon

PO : 287215  
Client's COC # : none  
Job : 100006114/JPL Groundwater Monitoring  
Cooler Temp 1°C Samples Received 07-Sep-11 Date Printed 21-Oct-11

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

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles		TAT	Requested Tests			Sample Remarks
			Alpha	Sub		314_W	METALS_D W	VOC_TIC_W	
BM111090748-01A	MW-26-2	AQ 09/06/11 09:17	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-02A	MW-26-1	AQ 09/06/11 09:36	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-03A	MW-25-5	AQ 09/06/11 10:50	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-04A	MW-25-4	AQ 09/06/11 11:17	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-05A	MW-25-3	AQ 09/06/11 11:42	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-06A	MW-25-2	AQ 09/06/11 12:10	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-07A	MW-25-1	AQ 09/06/11 12:31	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-08A	DUPE-05-3Q11	AQ 09/06/11 00:00	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-09A	EB-10-09/06/11	AQ 09/06/11 09:45	5	0	10	Perchlorate	Cr	VOC by 524 Criteria	
BM111090748-10A	TB-10-09/06/11	AQ 09/06/11 07:30	1	0	10			VOC by 524 Criteria	RENO TRIP BLANK 6/7/11

Comments: Security seals intact. Frozen ice. Temp Blank #7651 received @ 1°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Amended 10/21/11 to change Metals AQ to Metals DW due to login error. Due ASAP. CG.

Logged in by:  Signature  
Cheryl Gamble Print Name  
Alpha Analytical, Inc. 10/21/11 13:33 Company Date/Time

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-Orto T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

# CHAIN-OF-CUSTODY RECORD

## Alpha Analytical, Inc.

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

# CA

WorkOrder : BMIS11090748

Report Due By : 5:00 PM On : 21-Sep-11

Client: Battelle Memorial Institute  
655 West Broadway  
Suite 1420  
San Diego, CA 92101  
PO : 287215

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

EDD Required : Yes

Sampled by : Chase Brogdon

Client's COC # : none Job : 100006114/JPL Groundwater Monitoring

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

Cooler Temp 1 °C

Samples Received 07-Sep-11

Date Printed 07-Sep-11

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub	TAT	Requested Tests			Sample Remarks			
					314_W	METALS_A Q	VOC_TIC_W				
BM111090748-01A	MMW-26-2	AQ 09/06/11 09.17	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC_W	VOC by S24 Criteria		
BM111090748-02A	MMW-26-1	AQ 09/06/11 09.36	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-03A	MMW-25-5	AQ 09/06/11 10.50	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-04A	MMW-25-4	AQ 09/06/11 11.17	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-05A	MMW-25-3	AQ 09/06/11 11.42	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-06A	MMW-25-2	AQ 09/06/11 12.10	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-07A	MMW-25-1	AQ 09/06/11 12.31	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-08A	DUPE-05-3Q11	AQ 09/06/11 00:00	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-09A	EB-10-09/06/11	AQ 09/06/11 09.45	5 0	10	Perchlorate	Cr	VOC by S24 Criteria	VOC by S24 Criteria			
BM111090748-10A	TB-10-09/06/11	AQ 09/06/11 07.30	1 0	10			VOC by S24 Criteria	VOC by S24 Criteria			RENO TRIP BLANK 6/7/11

Comments: Security seals intact. Frozen ice. Temp Blank #7651 received @ 1°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E. MS/MSD).

Logged in by:  Signature  Print Name  Company  Date/Time

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-Orho T-Tedlar B-Brass P-Plastic OT-Other

**Billing Information:**

Name BATTELLE / GERALD THOMPSON  
 Address SOS LINE 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  NV  WA   
 ID  OR  OTHER

Page # 1 of 1

**Analyses Required**

VOCS (524.2)   
 TOTAL CR (200.8)   
 PERCHLORATE (314.0)

Required QC Level?  
 I  II  III  IV

EDD / EDF? YES  NO

Global ID # \_\_\_\_\_

REMARKS

Client Name	Address	City, State, Zip	PO. #	Job #	Phone #	Fax #	Sample Description	TAT	Field Filtered	Total and Type of containers ** See below	VOCS (524.2)	TOTAL CR (200.8)	PERCHLORATE (314.0)	EDD / EDF? YES	NO	REMARKS
BATTELLE / DAVID CONNER	3990 OLD TOWN AVE - C-205	DIEGO, CA 92110	287215	180006114	(619) 726-7311	(619) 726-7311	MW-26-2	NRM		5-Vials	X	X	X			
							MW-25-5			3v 2p	X	X	X			
							MW-25-4			3v 2p	X	X	X			
							MW-25-3			3v 2p	X	X	X			
							MW-25-2			3v 2p	X	X	X			
							MW-25-1			3v 2p	X	X	X			
							DUP-05-3Q11			3v 2p	X	X	X			Duplicate
							EB-10-09/06/11			3v 2p	X	X	X			EARLY PREP BLANK
							TB-10-09/06/11			1v	X	X	X			TRAP BLANK

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	DAVID CONNER	BATTELLE	09/06/11	13:45
<i>[Signature]</i>	ARTHUR STARK	BATTELLE	9/10/11	15:30
<i>[Signature]</i>	CHERYL GAMBLE	BATTELLE	9/17/11	13:39

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* - L-Liter V-Vol 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.



# Alpha Analytical, Inc.

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

Date: 21-Sep-11

David Conner  
Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
(619) 726-7311

Suite 1420

## CASE NARRATIVE

Job: 100006114/JPL Groundwater Monitoring

Work Order: BMI11090825

Cooler Temp: 0°C

Alpha's Sample ID	Client's Sample ID	Matrix
11090825-01A	MW-12-5	Aqueous
11090825-02A	MW-12-4	Aqueous
11090825-03A	MW-12-3	Aqueous
11090825-04A	MW-12-2	Aqueous
11090825-05A	MW-12-1	Aqueous
11090825-06A	EB-11-09/07/11	Aqueous
11090825-07A	TB-11-09/07/11	Aqueous
11090825-08A	MW-11-4	Aqueous
11090825-09A	MW-11-3	Aqueous
11090825-10A	MW-11-2	Aqueous
11090825-11A	MW-11-1	Aqueous
11090825-12A	DUPE-06-3Q11	Aqueous

### Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
11090825-01A	EPA Method 314.0	Perchlorate
11090825-02A	EPA Method 314.0	Perchlorate
11090825-03A	EPA Method 314.0	Perchlorate
11090825-11A	EPA Method 314.0	Perchlorate

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

*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.



# Alpha Analytical, Inc.

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

## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/08/11

Job: 100006114/JPL Groundwater Monitoring

### Anions by IC EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-11-1				
Lab ID: BM111090825-11A Chloride	23	0.50 mg/L	09/09/11 11:53	09/09/11 11:55
Date Sampled 09/07/11 13:16 Nitrite (NO2) - N	ND	0.25 mg/L	09/09/11 11:53	09/09/11 11:55
Nitrate (NO3) - N	0.91	0.25 mg/L	09/09/11 11:53	09/09/11 11:55
Phosphate, ortho - P	ND	0.50 mg/L	09/09/11 11:53	09/09/11 11:55
Sulfate (SO4)	52	0.50 mg/L	09/09/11 11:53	09/09/11 11:55
Client ID: DUPE-06-3Q11				
Lab ID: BM111090825-12A Chloride	23	0.50 mg/L	09/09/11 11:53	09/09/11 12:14
Date Sampled 09/07/11 00:00 Nitrite (NO2) - N	ND	0.25 mg/L	09/09/11 11:53	09/09/11 12:14
Nitrate (NO3) - N	0.91	0.25 mg/L	09/09/11 11:53	09/09/11 12:14
Phosphate, ortho - P	ND	0.50 mg/L	09/09/11 11:53	09/09/11 12:14
Sulfate (SO4)	52	0.50 mg/L	09/09/11 11:53	09/09/11 12:14

ND = Not Detected

*Roger Scholl*      *Randy Gardner*      *Walter Hinchman*

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*9/20/11*

**Report Date**





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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/08/11

Job: 100006114/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography  
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-12-5</b> Lab ID : BM11090825-01A Perchlorate Date Sampled 09/07/11 09:10	1.61	1.00 µg/L	09/12/11 15:22	09/12/11 19:22
Client ID: <b>MW-12-4</b> Lab ID : BM11090825-02A Perchlorate Date Sampled 09/07/11 09:28	3.49	1.00 µg/L	09/12/11 15:22	09/12/11 19:40
Client ID: <b>MW-12-3</b> Lab ID : BM11090825-03A Perchlorate Date Sampled 09/07/11 09:51	4.29	1.00 µg/L	09/12/11 15:22	09/12/11 19:59
Client ID: <b>MW-12-2</b> Lab ID : BM11090825-04A Perchlorate Date Sampled 09/07/11 10:11	6.10	1.00 µg/L	09/12/11 15:22	09/12/11 20:54
Client ID: <b>MW-12-1</b> Lab ID : BM11090825-05A Perchlorate Date Sampled 09/07/11 10:42	ND	1.00 µg/L	09/12/11 15:22	09/12/11 21:13
Client ID: <b>EB-11-09/07/11</b> Lab ID : BM11090825-06A Perchlorate Date Sampled 09/07/11 10:29	ND	1.00 µg/L	09/12/11 15:22	09/12/11 22:08
Client ID: <b>MW-11-4</b> Lab ID : BM11090825-08A Perchlorate Date Sampled 09/07/11 11:51	ND	1.00 µg/L	09/12/11 15:22	09/12/11 22:26
Client ID: <b>MW-11-3</b> Lab ID : BM11090825-09A Perchlorate Date Sampled 09/07/11 12:16	ND	1.00 µg/L	09/12/11 15:22	09/19/11 12:33
Client ID: <b>MW-11-2</b> Lab ID : BM11090825-10A Perchlorate Date Sampled 09/07/11 12:38	ND	1.00 µg/L	09/12/11 15:22	09/12/11 23:03
Client ID: <b>MW-11-1</b> Lab ID : BM11090825-11A Perchlorate Date Sampled 09/07/11 13:16	ND	1.00 µg/L	09/12/11 15:22	09/12/11 23:21
Client ID: <b>DUPE-06-3Q11</b> Lab ID : BM11090825-12A Perchlorate Date Sampled 09/07/11 00:00	ND	1.00 µg/L	09/12/11 15:22	09/12/11 23:40



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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](mailto:info@alpha-analytical.com)

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*PS*

9/21/11

**Report Date**



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

Attn: David Conner  
Phone: (619) 726-7311  
Fax: (614) 458-6641  
Date Received : 09/08/11

Job: 100006114/JPL Groundwater Monitoring

Metals by ICPMS  
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-12-3</b> Lab ID: BM111090825-03A Chromium (Cr) Date Sampled 09/07/11 09:51	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:02
Client ID: <b>MW-12-2</b> Lab ID: BM111090825-04A Chromium (Cr) Date Sampled 09/07/11 10:11	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:08
Client ID: <b>MW-12-1</b> Lab ID: BM111090825-05A Chromium (Cr) Date Sampled 09/07/11 10:42	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 14:38
Client ID: <b>EB-11-09/07/11</b> Lab ID: BM111090825-06A Chromium (Cr) Date Sampled 09/07/11 10:29	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:14
Client ID: <b>MW-11-3</b> Lab ID: BM111090825-09A Chromium (Cr) Date Sampled 09/07/11 12:16	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 05:21
Client ID: <b>MW-11-2</b> Lab ID: BM111090825-10A Chromium (Cr) Date Sampled 09/07/11 12:38	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:31
Client ID: <b>MW-11-1</b> Lab ID: BM111090825-11A Chromium (Cr) Date Sampled 09/07/11 13:16	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:37
Client ID: <b>DUPE-06-3Q11</b> Lab ID: BM111090825-12A Chromium (Cr) Date Sampled 09/07/11 00:00	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:42

ND = Not Detected

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

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9/20/11

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101

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

Job: 100006114/JPL Groundwater Monitoring

### Tentatively Identified Compounds - Volatile Organics by GC/MS

Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : <b>MW-12-5</b> Lab ID : BMI11090825-01A Date Received : 09/08/11 Date Sampled : 09/07/11 09:10	Sulfur dioxide	2.8	2.0 µg/L	09/16/11 11:58 09/16/11 11:58
Client ID : <b>MW-12-4</b> Lab ID : BMI11090825-02A Date Received : 09/08/11 Date Sampled : 09/07/11 09:28	Sulfur dioxide	3.1	2.0 µg/L	09/16/11 12:20 09/16/11 12:20
Client ID : <b>MW-12-3</b> Lab ID : BMI11090825-03A Date Received : 09/08/11 Date Sampled : 09/07/11 09:51	Sulfur dioxide	4.1	2.0 µg/L	09/16/11 12:41 09/16/11 12:41
Client ID : <b>MW-12-2</b> Lab ID : BMI11090825-04A Date Received : 09/08/11 Date Sampled : 09/07/11 10:11	Sulfur dioxide	2.6	2.0 µg/L	09/16/11 13:03 09/16/11 13:03
Client ID : <b>MW-12-1</b> Lab ID : BMI11090825-05A Date Received : 09/08/11 Date Sampled : 09/07/11 10:42	*** None Found ***	ND	2.0 µg/L	09/16/11 13:24 09/16/11 13:24
Client ID : <b>EB-11-09/07/11</b> Lab ID : BMI11090825-06A Date Received : 09/08/11 Date Sampled : 09/07/11 10:29	*** None Found ***	ND	2.0 µg/L	09/16/11 13:46 09/16/11 13:46
Client ID : <b>TB-11-09/07/11</b> Lab ID : BMI11090825-07A Date Received : 09/08/11 Date Sampled : 09/07/11 07:30	*** None Found ***	ND	2.0 µg/L	09/16/11 14:07 09/16/11 14:07
Client ID : <b>MW-11-4</b> Lab ID : BMI11090825-08A Date Received : 09/08/11 Date Sampled : 09/07/11 11:51	Sulfur dioxide	5.8	2.0 µg/L	09/16/11 14:29 09/16/11 14:29
Client ID : <b>MW-11-3</b> Lab ID : BMI11090825-09A Date Received : 09/08/11 Date Sampled : 09/07/11 12:16	Sulfur dioxide	4.5	2.0 µg/L	09/16/11 14:50 09/16/11 14:50



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Client ID :	<b>MW-11-2</b>				
Lab ID :	BMI11090825-10A	Sulfur dioxide	3.0	2.0 µg/L	09/16/11 15:12 09/16/11 15:12
Date Received :	09/08/11				
Date Sampled :	09/07/11 12:38				
Client ID :	<b>MW-11-1</b>				
Lab ID :	BMI11090825-11A	Sulfur dioxide	2.5	2.0 µg/L	09/16/11 15:33 09/16/11 15:33
Date Received :	09/08/11				
Date Sampled :	09/07/11 13:16				
Client ID :	<b>DUPE-06-3Q11</b>				
Lab ID :	BMI11090825-12A	Sulfur dioxide	2.2	2.0 µg/L	09/16/11 15:55 09/16/11 15:55
Date Received :	09/08/11				
Date Sampled :	09/07/11 00:00				

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  
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9/21/11

**Report Date**

Page 1 of 1



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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-01A  
Client I.D. Number: MW-12-5

Sampled: 09/07/11 09:10  
Received: 09/08/11  
Extracted: 09/16/11 11:58  
Analyzed: 09/16/11 11:58

### 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	0.65	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	111	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 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.

9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-02A  
Client I.D. Number: MW-12-4

Sampled: 09/07/11 09:28  
Received: 09/08/11  
Extracted: 09/16/11 12:20  
Analyzed: 09/16/11 12:20

### 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	0.86	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	1.3	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	112	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	91	(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

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9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-03A  
Client I.D. Number: MW-12-3

Sampled: 09/07/11 09:51  
Received: 09/08/11  
Extracted: 09/16/11 12:41  
Analyzed: 09/16/11 12:41

### 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	0.91	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	1.8	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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date





# 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: 100006114/JPL Groundwater Monitoring

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

Alpha Analytical Number: BMI11090825-04A

Client I.D. Number: MW-12-2

Sampled: 09/07/11 10:11

Received: 09/08/11

Extracted: 09/16/11 13:03

Analyzed: 09/16/11 13:03

### 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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	96	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-05A  
Client I.D. Number: MW-12-1

Sampled: 09/07/11 10:42  
Received: 09/08/11  
Extracted: 09/16/11 13:24  
Analyzed: 09/16/11 13:24

### 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	114	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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			

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

J=Estimated: The analyte was positively identified; the quantitation is an estimation.

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date



# Alpha Analytical, Inc.

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## ANALYTICAL REPORT

Battelle Memorial Institute  
655 West Broadway  
San Diego, CA 92101  
Job: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-06A  
Client I.D. Number: EB-11-09/07/11

Sampled: 09/07/11 10:29  
Received: 09/08/11  
Extracted: 09/16/11 13:46  
Analyzed: 09/16/11 13:46

### 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	116	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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

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*[Signature]*  
9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-07A  
Client I.D. Number: TB-11-09/07/11

Sampled: 09/07/11 07:30  
Received: 09/08/11  
Extracted: 09/16/11 14:07  
Analyzed: 09/16/11 14:07

### 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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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9/21/11

Report Date

Page 1 of 1



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-08A  
Client I.D. Number: MW-11-4

Sampled: 09/07/11 11:51  
Received: 09/08/11  
Extracted: 09/16/11 14:29  
Analyzed: 09/16/11 14:29

### 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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	90	(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 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

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9/21/11

Report Date



# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-09A  
Client I.D. Number: MW-11-3

Sampled: 09/07/11 12:16  
Received: 09/08/11  
Extracted: 09/16/11 14:50  
Analyzed: 09/16/11 14:50

### 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	115	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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  
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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-10A  
Client I.D. Number: MW-11-2

Sampled: 09/07/11 12:38  
Received: 09/08/11  
Extracted: 09/16/11 15:12  
Analyzed: 09/16/11 15:12

### 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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	98	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	89	(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  
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*AS*

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Report Date

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# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-11A  
Client I.D. Number: MW-11-1

Sampled: 09/07/11 13:16  
Received: 09/08/11  
Extracted: 09/16/11 15:33  
Analyzed: 09/16/11 15:33

### 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	97	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	88	(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 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.

9/21/11

Report Date

Page 1 of 1





# 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: 100006114/JPL Groundwater Monitoring

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

Alpha Analytical Number: BMI11090825-12A  
Client I.D. Number: DUPE-06-3Q11

Sampled: 09/07/11 00:00  
Received: 09/08/11  
Extracted: 09/16/11 15:55  
Analyzed: 09/16/11 15:55

### 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-Dichloroethane	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-Dichloroethane	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-Dichloroethane	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 Trichloroethane	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	113	(70-130) %REC
30 1,1,2-Trichloroethane	ND	0.50 µg/L	65 Surr: Toluene-d8	99	(70-130) %REC
31 Toluene	ND	0.50 µg/L	66 Surr: 4-Bromofluorobenzene	87	(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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer  
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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.

9/21/11

Report Date



# Alpha Analytical, Inc.

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

## VOC Sample Preservation Report

Work Order: BMI11090825

Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11090825-01A	MW-12-5	Aqueous	2
11090825-02A	MW-12-4	Aqueous	2
11090825-03A	MW-12-3	Aqueous	2
11090825-04A	MW-12-2	Aqueous	2
11090825-05A	MW-12-1	Aqueous	2
11090825-06A	EB-11-09/07/11	Aqueous	2
11090825-07A	TB-11-09/07/11	Aqueous	2
11090825-08A	MW-11-4	Aqueous	2
11090825-09A	MW-11-3	Aqueous	2
11090825-10A	MW-11-2	Aqueous	2
11090825-11A	MW-11-1	Aqueous	2
11090825-12A	DUPE-06-3Q11	Aqueous	2

9/21/11  
Report Date



# Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778  
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Date:  
15-Sep-11

## QC Summary Report

Work Order:  
11090825

### Method Blank

Type **MBLK** Test Code: **EPA Method 300.0**

File ID: **24**

Batch ID: **27283**

Analysis Date: **09/09/2011 13:10**

Sample ID: **MB-27283**

Units : **mg/L**

Run ID: **IC\_1\_110909A**

Prep Date: **09/09/2011 11:53**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

### Laboratory Fortified Blank

Type **LFB** Test Code: **EPA Method 300.0**

File ID: **25**

Batch ID: **27283**

Analysis Date: **09/09/2011 13:28**

Sample ID: **LFB-27283**

Units : **mg/L**

Run ID: **IC\_1\_110909A**

Prep Date: **09/09/2011 11:53**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	49.2	0.5	50		98	90	110			
Phosphate, ortho - P	5.04	0.5	5		101	90	110			
Sulfate (SO4)	101	0.5	100		101	90	110			

### Sample Matrix Spike

Type **LFM** Test Code: **EPA Method 300.0**

File ID: **22**

Batch ID: **27283**

Analysis Date: **09/09/2011 12:32**

Sample ID: **11090825-11ALFM**

Units : **mg/L**

Run ID: **IC\_1\_110909A**

Prep Date: **09/09/2011 11:53**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	71.8	0.5	50	23.29	97	80	120			
Phosphate, ortho - P	5.86	0.5	5	0	117	80	120			
Sulfate (SO4)	148	0.5	100	52.02	96	80	120			

### Sample Matrix Spike Duplicate

Type **LFMD** Test Code: **EPA Method 300.0**

File ID: **23**

Batch ID: **27283**

Analysis Date: **09/09/2011 12:51**

Sample ID: **11090825-11ALFMD**

Units : **mg/L**

Run ID: **IC\_1\_110909A**

Prep Date: **09/09/2011 11:53**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	73.2	0.5	50	23.29	99.8	80	120	71.76	2.0(15)	
Phosphate, ortho - P	5.88	0.5	5	0	118	80	120	5.863	0.3(15)	
Sulfate (SO4)	152	0.5	100	52.02	99.6	80	120	148.3	2.2(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.



# Alpha Analytical, Inc.

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Date:  
20-Sep-11

## QC Summary Report

Work Order:  
11090825

### Method Blank

File ID: 14	Type	MBLK	Test Code: EPA Method 314.0							
Sample ID: MB-27294	Units : µg/L		Batch ID: 27294				Analysis Date: 09/12/2011 16:18			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND		1							

### Laboratory Fortified Blank

File ID: 15	Type	LFB	Test Code: EPA Method 314.0							
Sample ID: LFB-27294	Units : µg/L		Batch ID: 27294				Analysis Date: 09/12/2011 16:36			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.3	2	25		97	85	115			

### Sample Matrix Spike

File ID: 31	Type	LFM	Test Code: EPA Method 314.0							
Sample ID: 11090825-05ALFM	Units : µg/L		Batch ID: 27294				Analysis Date: 09/12/2011 21:31			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	26.6	2	25	0	106	80	120			

### Sample Matrix Spike Duplicate

File ID: 32	Type	LFMD	Test Code: EPA Method 314.0							
Sample ID: 11090825-05ALFMD	Units : µg/L		Batch ID: 27294				Analysis Date: 09/12/2011 21:49			
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.2	2	25	0	93	80	120	26.6	13.6(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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

### Method Blank

File ID: 091211.B\019\_M.D\

Sample ID: MB-27282

Analyte

Chromium (Cr)

Type: MBLK Test Code: EPA Method 200.8

Batch ID: 27282

Analysis Date: 09/12/2011 14:09

Units : mg/L Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

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

### Laboratory Control Spike

File ID: 091211.B\020\_M.D\

Sample ID: LCS-27282

Analyte

Chromium (Cr)

Type: LCS Test Code: EPA Method 200.8

Batch ID: 27282

Analysis Date: 09/12/2011 14:15

Units : mg/L Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
0.0508	0.005	0.05		102	85	115			

### Sample Matrix Spike

File ID: 091211.B\025\_M.D\

Sample ID: 11090825-05AMS

Analyte

Chromium (Cr)

Type: MS Test Code: EPA Method 200.8

Batch ID: 27282

Analysis Date: 09/12/2011 14:44

Units : mg/L Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
0.051	0.005	0.05	0	102	70	130			

### Sample Matrix Spike Duplicate

File ID: 091211.B\026\_M.D\

Sample ID: 11090825-05AMSD

Analyte

Chromium (Cr)

Type: MSD Test Code: EPA Method 200.8

Batch ID: 27282

Analysis Date: 09/12/2011 14:50

Units : mg/L Run ID: ICP/MS\_110912A

Prep Date: 09/09/2011 11:02

Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
0.0481	0.005	0.05	0	96	70	130	0.05101	6.0(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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

### Method Blank

Type: MBLK Test Code: EPA Method SW8260B

File ID: 11091606.D

Batch ID: MS15W0916M

Analysis Date: 09/16/2011 10:11

Sample ID: MBLK MS15W0916M

Units : µg/L

Run ID: MSD\_15\_110916B

Prep Date: 09/16/2011 10:11

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	11.1		10		111	70	130			
Surr: Toluene-d8	9.69		10		97	70	130			



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**Date:**  
21-Sep-11

## QC Summary Report

**Work Order:**  
11090825

Surr: 4-Bromofluorobenzene

8.84

10

88

70

130



# Alpha Analytical, Inc.

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Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

### Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8260B

File ID: 11091603.D

Batch ID: MS15W0916M

Analysis Date: 09/16/2011 09:06

Sample ID: LCS MS15W0916M

Units : µg/L

Run ID: MSD\_15\_110916B

Prep Date: 09/16/2011 09:06

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.59	1	10		96	70	130			
Chloromethane	12.1	2	10		121	70	130			
Vinyl chloride	10.9	1	10		109	70	130			
Chloroethane	11.9	1	10		119	70	130			
Bromomethane	9.73	2	10		97	70	130			
Trichlorofluoromethane	12.9	1	10		129	70	130			
1,1-Dichloroethene	10.3	1	10		103	70	130			
Dichloromethane	10.1	2	10		101	70	130			
Freon-113	11.8	1	10		118	70	137			
trans-1,2-Dichloroethene	10.5	1	10		105	70	130			
Methyl tert-butyl ether (MTBE)	11.7	0.5	10		117	70	130			
1,1-Dichloroethane	10.7	1	10		107	70	130			
2-Butanone (MEK)	252	10	200		126	70	130			
cis-1,2-Dichloroethene	10.6	1	10		106	70	130			
Bromochloromethane	11.4	1	10		114	70	130			
Chloroform	11.1	1	10		111	70	130			
2,2-Dichloropropane	11.2	1	10		112	70	130			
1,2-Dichloroethane	11.7	1	10		117	70	130			
1,1,1-Trichloroethane	11.2	1	10		112	70	130			
1,1-Dichloropropene	11.5	1	10		115	70	130			
Carbon tetrachloride	10.6	1	10		106	70	130			
Benzene	10.9	0.5	10		109	70	130			
Dibromomethane	11.6	1	10		116	70	130			
1,2-Dichloropropane	10.5	1	10		105	70	130			
Trichloroethene	10.8	1	10		108	70	130			
Bromodichloromethane	10.8	1	10		108	70	130			
4-Methyl-2-pentanone (MIBK)	31	2.5	25		124	20	182			
cis-1,3-Dichloropropene	10.7	1	10		107	70	130			
trans-1,3-Dichloropropene	10.3	1	10		103	70	130			
1,1,2-Trichloroethane	11.4	1	10		114	70	130			
Toluene	10.5	0.5	10		105	70	130			
1,3-Dichloropropane	10.6	1	10		106	70	130			
Dibromochloromethane	8.94	1	10		89	70	130			
1,2-Dibromoethane (EDB)	21.4	2	20		107	70	130			
Tetrachloroethene	10.5	1	10		105	70	130			
1,1,1,2-Tetrachloroethane	10.5	1	10		105	70	130			
Chlorobenzene	10.3	1	10		103	70	130			
Ethylbenzene	11.1	0.5	10		111	70	130			
m,p-Xylene	11	0.5	10		110	70	130			
Bromoform	8.56	1	10		86	70	130			
Styrene	9.44	1	10		94	70	130			
o-Xylene	11	0.5	10		110	70	130			
1,1,2,2-Tetrachloroethane	10.4	1	10		104	70	130			
1,2,3-Trichloropropane	22.7	2	20		113	70	130			
Isopropylbenzene	9.69	1	10		97	70	130			
Bromobenzene	10.2	1	10		102	70	130			
n-Propylbenzene	10.1	1	10		101	70	130			
4-Chlorotoluene	9.82	1	10		98	70	130			
2-Chlorotoluene	9.62	1	10		96	70	130			
1,3,5-Trimethylbenzene	10.3	1	10		103	70	130			
tert-Butylbenzene	10	1	10		100	70	130			
1,2,4-Trimethylbenzene	10.4	1	10		104	70	130			
sec-Butylbenzene	9.92	1	10		99	70	130			
1,3-Dichlorobenzene	10.6	1	10		106	70	130			
1,4-Dichlorobenzene	9.78	1	10		98	70	130			
4-Isopropyltoluene	10.3	1	10		103	70	130			
1,2-Dichlorobenzene	9.81	1	10		98	70	130			
n-Butylbenzene	10.7	1	10		107	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	51.1	3	50		102	67	130			
1,2,4-Trichlorobenzene	9.77	2	10		98	70	130			
Naphthalene	9.44	2	10		94	70	130			
Hexachlorobutadiene	20.5	2	20		103	70	130			
1,2,3-Trichlorobenzene	10.4	2	10		104	70	130			
Surr: 1,2-Dichloroethane-d4	11.4		10		114	70	130			
Surr: Toluene-d8	9.49		10		95	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:**

21-Sep-11

## QC Summary Report

**Work Order:**

11090825

Surr: 4-Bromofluorobenzene

9.01

10

90

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:

21-Sep-11

## QC Summary Report

Work Order:

11090825

Sample Matrix Spike

Type: MS

Test Code: EPA Method SW8260B

File ID: 11091607.D

Batch ID: MS15W0916M

Analysis Date: 09/16/2011 10:32

Sample ID: 11090825-05AMS

Units : µg/L

Run ID: MSD\_15\_110916B

Prep Date: 09/16/2011 10:32

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	47.8	2.5	50	0	96	21	138			
Chloromethane	56.7	10	50	0	113	23	144			
Vinyl chloride	56.2	2.5	50	0	112	49	136			
Chloroethane	56.1	2.5	50	0	112	21	159			
Bromomethane	44.7	10	50	0	89	10	174			
Trichlorofluoromethane	60.4	2.5	50	0	121	32	154			
1,1-Dichloroethene	46.1	2.5	50	0	92	64	130			
Dichloromethane	43.8	10	50	0	88	69	130			
Freon-113	52.7	2.5	50	0	105	55	141			
trans-1,2-Dichloroethene	46.1	2.5	50	0	92	63	130			
Methyl tert-butyl ether (MTBE)	48.6	1.3	50	0	97	47	150			
1,1-Dichloroethane	46.8	2.5	50	0	94	66	130			
2-Butanone (MEK)	860	50	1000	0	86	23	182			
cis-1,2-Dichloroethene	46.2	2.5	50	0	92	70	130			
Bromochloromethane	48.1	2.5	50	0	96	70	132			
Chloroform	48	2.5	50	0	96	70	130			
2,2-Dichloropropane	49	2.5	50	0	98	38	154			
1,2-Dichloroethane	50	2.5	50	0	99.9	65	134			
1,1,1-Trichloroethane	48.4	2.5	50	0	97	65	136			
1,1-Dichloropropene	49.9	2.5	50	0	99.8	68	132			
Carbon tetrachloride	46.4	2.5	50	0	93	58	148			
Benzene	47.4	1.3	50	0	95	59	138			
Dibromomethane	48.3	2.5	50	0	97	70	130			
1,2-Dichloropropane	45.4	2.5	50	0	91	70	131			
Trichloroethene	46.5	2.5	50	0	93	65	144			
Bromodichloromethane	44.7	2.5	50	0	89	50	157			
4-Methyl-2-pentanone (MIBK)	124	13	125	0	99	20	182			
cis-1,3-Dichloropropene	44.3	2.5	50	0	89	63	131			
trans-1,3-Dichloropropene	41.5	2.5	50	0	83	65	136			
1,1,2-Trichloroethane	47.7	2.5	50	0	95	70	131			
Toluene	45.1	1.3	50	0	90	68	130			
1,3-Dichloropropane	44.1	2.5	50	0	88	70	130			
Dibromochloromethane	36.1	2.5	50	0	72	42	155			
1,2-Dibromoethane (EDB)	88.1	5	100	0	88	70	130			
Tetrachloroethene	45.5	2.5	50	0	91	65	130			
1,1,1,2-Tetrachloroethane	44.1	2.5	50	0	88	70	130			
Chlorobenzene	44.3	2.5	50	0	89	70	130			
Ethylbenzene	48.2	1.3	50	0	96	68	130			
m,p-Xylene	47.2	1.3	50	0	94	68	131			
Bromoform	33.5	2.5	50	0	67	65	143			
Styrene	40.3	2.5	50	0	81	59	153			
o-Xylene	47.1	1.3	50	0	94	70	130			
1,1,2,2-Tetrachloroethane	42.4	2.5	50	0	85	67	130			
1,2,3-Trichloropropane	92.1	10	100	0	92	70	130			
Isopropylbenzene	43.4	2.5	50	0	87	55	138			
Bromobenzene	44.3	2.5	50	0	89	70	130			
n-Propylbenzene	44.9	2.5	50	0	90	67	133			
4-Chlorotoluene	42.8	2.5	50	0	86	70	130			
2-Chlorotoluene	43.1	2.5	50	0	86	70	130			
1,3,5-Trimethylbenzene	46.1	2.5	50	0	92	67	134			
tert-Butylbenzene	44.7	2.5	50	0	89	55	147			
1,2,4-Trimethylbenzene	46	2.5	50	0	92	65	135			
sec-Butylbenzene	44.2	2.5	50	0	88	68	135			
1,3-Dichlorobenzene	46.1	2.5	50	0	92	70	130			
1,4-Dichlorobenzene	42.5	2.5	50	0	85	70	130			
4-Isopropyltoluene	46	2.5	50	0	92	68	132			
1,2-Dichlorobenzene	42.2	2.5	50	0	84	70	130			
n-Butylbenzene	46.9	2.5	50	0	94	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	203	15	250	0	81	64	130			
1,2,4-Trichlorobenzene	40	10	50	0	80	62	133			
Naphthalene	36.4	10	50	0	73	32	166			
Hexachlorobutadiene	87	10	100	0	87	63	130			
1,2,3-Trichlorobenzene	40.2	10	50	0	80	55	138			
Surr: 1,2-Dichloroethane-d4	55		50		110	70	130			
Surr: Toluene-d8	47.8		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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

Surr: 4-Bromofluorobenzene

46.2

50

92

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:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

### Sample Matrix Spike Duplicate

File ID: 11091608.D

Sample ID: 11090825-05AMSD

Type: MSD

Test Code: EPA Method SW8260B

Batch ID: MS15W0916M

Analysis Date: 09/16/2011 10:54

Run ID: MSD\_15\_110916B

Prep Date: 09/16/2011 10:54

Units: µg/L

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	47.2	2.5	50	0	94	21	138	47.83	1.4(33)	
Chloromethane	54.4	10	50	0	109	23	144	56.72	4.3(27)	
Vinyl chloride	62.9	2.5	50	0	126	49	136	56.16	11.3(21)	
Chloroethane	53.7	2.5	50	0	107	21	159	56.06	4.4(40)	
Bromomethane	32	10	50	0	64	10	174	44.69	33.2(40)	
Trichlorofluoromethane	63.5	2.5	50	0	127	32	154	60.41	5.0(37)	
1,1-Dichloroethene	47.7	2.5	50	0	95	64	130	46.1	3.4(21)	
Dichloromethane	43.3	10	50	0	87	69	130	43.77	1.1(20)	
Freon-113	55.7	2.5	50	0	111	55	141	52.73	5.6(40)	
trans-1,2-Dichloroethene	49	2.5	50	0	98	63	130	46.14	6.1(20)	
Methyl tert-butyl ether (MTBE)	51.8	1.3	50	0	104	47	150	48.56	6.4(40)	
1,1-Dichloroethane	49.3	2.5	50	0	99	66	130	46.79	5.2(20)	
2-Butanone (MEK)	812	50	1000	0	81	23	182	859.6	5.7(22)	
cis-1,2-Dichloroethene	47	2.5	50	0	94	70	130	46.19	1.7(20)	
Bromochloromethane	47.6	2.5	50	0	95	70	132	48.12	1.1(20)	
Chloroform	50	2.5	50	0	99.9	70	130	47.99	4.0(20)	
2,2-Dichloropropane	51.8	2.5	50	0	104	38	154	49.01	5.5(22)	
1,2-Dichloroethane	50.3	2.5	50	0	101	65	134	49.96	0.7(20)	
1,1,1-Trichloroethane	51.2	2.5	50	0	102	65	136	48.41	5.6(20)	
1,1-Dichloropropene	51.6	2.5	50	0	103	68	132	49.9	3.3(20)	
Carbon tetrachloride	49.2	2.5	50	0	98	58	148	46.4	5.9(20)	
Benzene	48.4	1.3	50	0	97	59	138	47.42	1.9(21)	
Dibromomethane	46.8	2.5	50	0	94	70	130	48.25	3.1(20)	
1,2-Dichloropropane	44.6	2.5	50	0	89	70	131	45.41	1.7(20)	
Trichloroethene	46.7	2.5	50	0	93	65	144	46.52	0.4(20)	
Bromodichloromethane	44.8	2.5	50	0	90	50	157	44.69	0.2(20)	
4-Methyl-2-pentanone (MIBK)	111	13	125	0	89	20	182	123.9	10.9(20)	
cis-1,3-Dichloropropene	39.5	2.5	50	0	79	63	131	44.34	11.5(20)	
trans-1,3-Dichloropropene	34.5	2.5	50	0	69	65	136	41.53	18.6(20)	
1,1,2-Trichloroethane	43.2	2.5	50	0	86	70	131	47.67	9.8(20)	
Toluene	49.1	1.3	50	0	98	68	130	45.1	8.4(20)	
1,3-Dichloropropane	45.9	2.5	50	0	92	70	130	44.12	3.9(20)	
Dibromochloromethane	38.6	2.5	50	0	77	42	155	36.07	6.8(20)	
1,2-Dibromoethane (EDB)	92.5	5	100	0	92	70	130	88.08	4.9(20)	
Tetrachloroethene	48.4	2.5	50	0	97	65	130	45.54	6.0(20)	
1,1,1,2-Tetrachloroethane	45.9	2.5	50	0	92	70	130	44.1	3.9(20)	
Chlorobenzene	45.8	2.5	50	0	92	70	130	44.31	3.3(20)	
Ethylbenzene	49.4	1.3	50	0	99	68	130	48.23	2.5(20)	
m,p-Xylene	48.2	1.3	50	0	96	68	131	47.2	2.0(20)	
Bromofom	36.5	2.5	50	0	73	65	143	33.48	8.7(20)	
Styrene	41.2	2.5	50	0	82	59	153	40.28	2.2(37)	
o-Xylene	48.2	1.3	50	0	96	70	130	47.11	2.2(20)	
1,1,2,2-Tetrachloroethane	43.8	2.5	50	0	88	67	130	42.39	3.3(20)	
1,2,3-Trichloropropane	94.9	10	100	0	95	70	130	92.1	3.0(20)	
Isopropylbenzene	43.2	2.5	50	0	86	55	138	43.37	0.4(20)	
Bromobenzene	44.4	2.5	50	0	89	70	130	44.3	0.2(20)	
n-Propylbenzene	44.5	2.5	50	0	89	67	133	44.86	0.7(30)	
4-Chlorotoluene	42.7	2.5	50	0	85	70	130	42.76	0.1(20)	
2-Chlorotoluene	42.7	2.5	50	0	85	70	130	43.11	0.9(20)	
1,3,5-Trimethylbenzene	45.9	2.5	50	0	92	67	134	46.14	0.6(21)	
tert-Butylbenzene	44.1	2.5	50	0	88	55	147	44.73	1.4(20)	
1,2,4-Trimethylbenzene	45.8	2.5	50	0	92	65	135	46.02	0.4(25)	
sec-Butylbenzene	43.8	2.5	50	0	88	68	135	44.18	1.0(20)	
1,3-Dichlorobenzene	46.9	2.5	50	0	94	70	130	46.07	1.8(20)	
1,4-Dichlorobenzene	42.6	2.5	50	0	85	70	130	42.54	0.1(20)	
4-Isopropyltoluene	45.3	2.5	50	0	91	68	132	46.03	1.6(20)	
1,2-Dichlorobenzene	43.3	2.5	50	0	87	70	130	42.16	2.7(20)	
n-Butylbenzene	46.6	2.5	50	0	93	62	134	46.88	0.6(21)	
1,2-Dibromo-3-chloropropane (DBCP)	231	15	250	0	92	64	130	202.9	13.1(20)	
1,2,4-Trichlorobenzene	47.5	10	50	0	95	62	133	39.98	17.2(29)	
Naphthalene	49.1	10	50	0	98	32	166	36.36	29.8(40)	
Hexachlorobutadiene	99.5	10	100	0	99	63	130	87	13.4(21)	
1,2,3-Trichlorobenzene	53.8	10	50	0	108	55	138	40.2	28.9(36)	
Surr: 1,2-Dichloroethane-d4	54.6		50		109	70	130			
Surr: Toluene-d8	51.3		50		103	70	130			



# Alpha Analytical, Inc.

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

Date:  
21-Sep-11

## QC Summary Report

Work Order:  
11090825

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Surr: 4-Bromofluorobenzene	45.4	50	91	70	130
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**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**

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

**CA**  
**WorkOrder : BMIS11090825**  
**Report Due By : 5:00 PM On : 21-Sep-11**

**Client:** Battelle Memorial Institute  
 655 West Broadway  
 Suite 1420  
 San Diego, CA 92101  
 PO : 287215  
 Clients COC # : 26618

**Report Attention** Phone Number **Email Address**  
 David Conner (619) 726-7311 x connerd@battelle.org  
 Betsy Cuite (614) 424-4899 x cuitee@battelle.org  
 Shane Walton (614) 424-4117 x waltonsh@battelle.org

Job : 100006114/JPL Groundwater Monitoring  
 QC Level : DSA = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates  
 Requested Tests  
 300\_0\_W 314\_W METALS\_D W VOC\_TIC\_W VOC\_W  
 Cooler Temp 0 °C Samples Received 08-Sep-11 Date Printed 08-Sep-11

Alpha Sample ID	Client Sample ID	Collection Date	No. of Bottles Alpha Sub	TAT	Requested Tests					Sample Remarks
					300_0_W	314_W	METALS_D W	VOC_TIC_W	VOC_W	
BMI11090825-01A	MMW-12-5	09/07/11 09:10	4	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-02A	MMW-12-4	09/07/11 09:28	4	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-03A	MMW-12-3	09/07/11 09:51	5	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-04A	MMW-12-2	09/07/11 10:11	5	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-05A	MMW-12-1	09/07/11 10:42	10	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		MS/MSD
BMI11090825-06A	EB-11-09/07/11	09/07/11 10:29	5	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-07A	TB-11-09/07/11	09/07/11 07:30	1	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		Reno Trip Blank 6/7/11
BMI11090825-08A	MMW-11-4	09/07/11 11:51	8	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		MS/MSD
BMI11090825-09A	MMW-11-3	09/07/11 12:16	5	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		
BMI11090825-10A	MMW-11-2	09/07/11 12:38	5	0	9	Perchlorate	VOC by 524 Criteria	VOC by 524 Criteria		

Comments: Security seals intact. Frozen ice. Temp Blank #5060 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E., MS/MSD).

Logged in by: K Murray Signature K Murray Print Name K Murray Company Alpha Analytical, Inc. Date/Time 9/8/11 11:25

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

# CHAIN-OF-CUSTODY RECORD

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

# CA

**WorkOrder : BMIS11090825**  
**Report Due By : 5:00 PM On : 21-Sep-11**

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

**Report Attention**    **Phone Number**    **Email Address**  
 David Connor    (619) 726-7311 x    connord@battelle.org  
 Betsy Cutie    (614) 424-4899 x    cutie@battelle.org  
 Shane Walton    (614) 424-4117 x    waltonsh@battelle.org

EDD Required : Yes

Sampled by : Chase Brogdon

PO : 287215  
 Client's COC # : 26618

Job : 100006114/JPL Groundwater Monitoring

Cooler Temp    Samples Received    Date Printed  
 0 °C    08-Sep-11    08-Sep-11

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

Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	Requested Tests				Sample Remarks	
				300_0_W	314_W	METALS_D W	VOC_TIC_W		VOC_W
BMI11090825-11A	MW-11-1	AQ 09/07/11 13:16	5 0 9	Cl, NO2, NO3, PO4, SO4	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11090825-12A	DUPE-06-3Q11	AQ 09/07/11 00:00	5 0 9	Cl, NO2, NO3, PO4, SO4	Perchlorate	Cr	VOC by 524 Criteria	VOC by 524 Criteria	

Comments: Security seals intact. Frozen ice. Temp Blank #5060 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD).

Logged in by: K Murray    Signature: \_\_\_\_\_    Print Name: \_\_\_\_\_    Company: Alpha Analytical, Inc.    Date/Time: 9/8/11 1125

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:**

Name: BATTELLE / GERALD TOMPKINS  
 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 States? 26618

AZ  CA  NV  WA   
 ID  OR  OTHER

Analyses Required

VOCS (524.2)  
 TOTAL CR (200.8)  
 PERCHLORINE  
 CHLORIDE, NITRATE,  
 NITRITE, PHOSPHATE,  
 SULFATE (200.0)

Required QC Level?  
 I  II  III  IV

EDD / EDF? YES  NO

Global ID # \_\_\_\_\_  
 REMARKS

Client Name	Address	City, State, Zip	PO #	Email Address	Job #	Phone #	Fax #	Report Attention	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Global ID #	REMARKS
BATTELLE / DAVID CONNEN	3990 OLD TOWN AVE. C-205	DIEGO, CA 92110	287215	CONNARD @ BATTELLE.ORG	100006114	(619) 726-7311	(614) 458-6614	DAVID CONNEN				4 VIALS		
0928									MW-12-5			4 VIALS		
0951									MW-12-3			5 VIALS		
1011									MW-12-2			5 VIALS		
1042									MW-12-1			10 VIALS		MS/MSD
1029									EB-11-09/07/11			3V 2P		COMPONENT BLANK
0330									TB-11-09/07/11			1V		TRIP BLANK
1151									MW-11-4			6V 2P		MS/MSD
1216									MW-11-3			3V 2P		
1238									MW-11-2			3V 2P		
1316									MW-11-1			3V 2P		
9/7/11									Dupe-06-3011			3V 2P		DUPLICATE

**ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
<i>[Signature]</i>	CHARL BRONSON	INTEGRAL REG. INC	9/7/11	1430
<i>[Signature]</i>	ARTHUR STARK	ALPHAS ANALYTICAL	9/7/11	1430
<i>[Signature]</i>	EMUNNY	AAI	9/8/11	1110

\*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air \*\* L-Liter V-Vol 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.



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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL-GW-3Q11 / 100006114**

Dear David:

Enclosed are the results of the sample submitted to our laboratory on August 23, 2011. For your reference, this analysis has been assigned our service request number P1103204.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 12:18 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL-GW-3Q11 / 100006114

CAS Project No: P1103204

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## CASE NARRATIVE

The sample was received intact under chain of custody on August 23, 2011 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL-GW-3Q11 / 100006114

Service Request: P1103204

Date Received: 8/23/2011  
 Time Received: 16:03

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-7	P1103204-001	Water	8/23/2011	10:35	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

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



**Client:** Battelle**Service Request:** P1103204**Project:** JPL-GW-3Q11/100006114

<b>Bottle ID</b>	<b>Tests</b>	<b>Date</b>	<b>Time</b>	<b>Sample Location / User</b>	<b>Disposed On</b>
P1103204-001.01	7196A	8/23/11	1620	SMO / SSTAPLES	
		8/23/11	1620	P-37 / SSTAPLES	
		8/23/11	1631	In Lab / SANDERSON	
		8/23/11	1810	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103204

Project: JPL-GW3Q11 / 100006114

Sample(s) received on: 8/23/11 Date opened: 8/23/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 3° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103204-001.01	125mL Plastic NP					

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103204  
Date Collected : 08/23/11  
Date Received : 08/23/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-7	P1103204-001	0.010	0.003	1	NA	08/23/11 17:15	ND	
Method Blank	P1103204-MB	0.010	0.003	1	NA	08/23/11 17:15	ND	

Approved By Kanu Rya Date : 8/29/11



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL-GW-3Q11 / 100006114

**Service Request:** P1103204  
**Date Analyzed:** 08/23/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 8/29/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL-GW-3Q11 / 100006114

**Service Request:** P1103204  
**Date Analyzed:** 08/23/11

**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	0.0500	0.0523	105	90-110
CCV1	0.0500	0.0514	103	90-110
CCV2	0.0500	0.0514	103	90-110

Approved By: Kam Rya Date: 8/29/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103204  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/23/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103204-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0418	105	90-110	

Approved By Kam Rya

Date : 8/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103204  
Date Collected : 08/23/11  
Date Received : 08/23/11  
Date Extracted : NA  
Date Analyzed : 08/23/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-7 Units : mg/L (ppm)  
Lab Code : P1103204-001MS P1103204-001DMS Basis : NA  
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0470	0.0470	94	94	73-119	<1	

Approved By Kara Rya Date : 8/29/11

# pH Run Log

Service Request #(s): P1103199 P1103204 P1103205

Time: 0807

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/2012	} 98.4%	—
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/2013		—
pH 10 Buffer	524-04261102	9/30/12		—

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	5,6	1.997	21.1°	P1103199-5.01 <sup>Ⓟ</sup>	6	9.337	15.6°
pH 4.000	—	3.989	21.3°	↓ -6.01 <sup>Ⓟ</sup>	↓	9.362	13.8°
pH 7.000	↓	7.016	21.3°	↓ -7.01 <sup>Ⓟ</sup>	↓	9.428	17.0°
pH 10.000	↓	10.017	21.1°	P1103204-1.01	5	1.818	13.0°
Ref#: 7196A EXP: 3/2013 524-05201102	↓	7.398	21.3°	P1103205-1.01	↓	1.874	8.2°
DI	5	2.085	21.2°	↓ -2.01	↓	1.860	9.1°
DI <sup>Ⓟ</sup>	6	9.426	21.4°	pH 2.000	5,6	2.016	21.0°
pH 10.000	5,6	10.021	21.4°				
TIME: 1445	Done						
pH 10.000	6	10.001	22.8°				
P1103199-1.01 <sup>Ⓟ</sup>	↓	9.215	19.0°				
↓ -2.01 <sup>Ⓟ</sup>	↓	9.291	20.9°				
↓ -3.01 <sup>Ⓟ</sup>	↓	9.213	20.6°				
pH 10.000	↓	10.011	21.9°				
TIME 1623	Done						
pH 10.000	5,6	10.003	21.2°				
P1103199-4.01 <sup>Ⓟ</sup>	6	9.138	15.6°				

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> AND 46284 EXP: 11/20/14

7199A: Diluted NaOH 524-04151102 EXP: 4/15/12

Comments: Ⓟ filtered prior to pH ADJUST

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

Date buffers and filling solution changed: 8/22/11

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

Analyst: [Signature]

Date: 8/23/11

Reviewer: [Signature]

Date: 8/25/11

Method EPA 7196A

Service Request#(s): P1103204 P1103205  
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12  
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Run#: 258710  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 44284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999908407
Absorbance @ 540 nm	0.000	0.010	0.057	0.113	

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	0.000426	10.003
2 ICV 0.05PPM		-	✓	0.000	0.059	0.059	0.0523	105%
3 MB		-	✓	0.000	0.000	0.000	0.000426	10.003
4 LCS 0.04PPM		-	✓	0.000	0.047	0.047	0.0418	105%
5 P1103204-1.01		-	✓	0.000	0.001	0.001	0.00130	10.003
6 -1.01 MS 0.05PPM		-	✓	0.000	0.048	0.048	0.0426	85% 2.1%
7 -1.01 MSD		-	✓	0.000	0.048	0.048	0.0426	85% 5 RPD
8 -2.01		-	✓	0.001	0.002	0.001	0.00130	10.003
9 -2.01 VS 0.03PPM		-	✓	0.001	0.030	0.029	0.0259	86%
10 P1103204-1.01		-	✓	0.000	0.002	0.002	0.00218	10.003
11 -1.01 MS 0.05PPM		-	✓	0.000	0.053	0.053	0.0470	94% 2.1%
12 -1.01 MSP		-	✓	0.000	0.053	0.053	0.0470	94% 5 RPD
13 CCV1		-	✓	0.000	0.058	0.058	0.0514	103%
14 CCV1		-	✓	0.000	0.070	0.070	0.000426	10.003
15 P1103204-1.01 VS 0.03PPM		-	✓	0.000	0.030	0.030	0.0268	89%
16 CCV2 0.05PPM		-	✓	0.000	0.058	0.058	0.0514	103%
17 CCV2		-	✓	0.000	0.070	0.070	0.000426	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 <sup>10</sup> 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 <sup>10</sup> 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of \_\_\_\_\_ <sup>10</sup> 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of \_\_\_\_\_ <sup>10</sup> 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 8/23/11 @ 1700

Date/Time: 8/23/11 @ 1715

Date: 8/25/11

10/6/10  
SA

524-10061001 25133ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10  
SA

524-10061002 25133ppb ION/CON for O3

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

EXP: 10/20/10

10/6/10  
SA

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA

524-10151001 Cr6+ ION/CON Stock  
Purchased 100ppm Cr6+

RICCA Chemical Co Cat No 2095-16  
500ml Plastic  
LOT # 1010177  
EXP: 3/20/12

10/15/10  
SA

524-10151002 500ppm NO2 Stock

Purchased  
RICCA Chemical Co Cat No: 5444-5-4  
LOT # 1010271 120ml amber glass

2/21/11  
JW 524-02211101 1:1 H<sub>2</sub>SO<sub>4</sub>  
250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

2/21/11  
JW 524-02211102 Carb Coloring Reagent  
0.2500g 1,5-diphenylcarbonylhydrazide (EMD lot 471039  
EXP: 4/30/13) ↑ 50 ml w/ Acetone (EMD  
lot #471540; EXP: 9/30/12).  
EXP: 3/31/11

2/28/11  
JW 524-02281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

2/28/11  
JW 524-02281102 1001<sup>mg</sup> Carb  
Purchased  
Inorganic Ventures CGCR(6)1-1  
125 ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012



2/28/11 524-02281103 10ppm Cr6+ Soln  
1.0 mL 524-02281102 (1000ppm Cr6+; EXP: 3/1/12) ↑  
100ml w/ DI H2O  
EXP: 2/28/12

3/7/11 524-03071101 Cr6+ Colony Reagent  
0.2500g 1,5-Diphenylcarbazide  
(EMD Lot 47103721, EXP: 1/30/13) ↑ 50ml w/  
Acetone (EMD 47154; EXP: 9/24/12).  
EXP: 4/7/11

3/7/11 524-03071102 500ppm NO2  
Purchased  
Ricca Chem Co Cat No 5444.5-4  
Lot # 1162544  
EXP: 8/20/11

3/17/11 524-03271101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
w/ DI H2O.  
EXP: 4/17/11

Reviewed And Approved By:

Initial: KL Date: 3/18/11

4/14/11 524-04141101 ICO2 Eluent  
75ml 524-04291002 (10x Conc Eluent, exp 4/29/11)  
↑ 750ml w/ DI H2O. DEGAS  
EXP: 4/28/11

524-04261102 pH 10.000 Buffer  
4/26/11 Purchased  
SN JT Baker Cat No: 5655-01 (500ml)  
Lot # J33524  
EXP: 9/30/12

4/26/11 524-04261103 NH3 FUMING SOLN  
SN Purchased  
Thermo Orion Orion 951202 (60ml)  
Lot # OX1 P/N: 70263-A04  
EXP: 4/26/12

4/26/11 524-04261103<sup>9/4/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
SN 250 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

4/27/11 524-04271101 Ammonio Sulfuric Soln  
SN 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
2.5ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxidant (Fisher 136338613408204; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
Jr  
524-04271102 A&B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5646-500 mL  
LOT # 1163379  
EXP: 3/30/13

4/28/11  
Jr  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
Jr  
524-05041101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
Jr  
524-05051101 Urlet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml W/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
Jr  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent. EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O. Degassed

5/19/11  
Jr

524-0591103

PCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD <sup>JT BAKER</sup> 305641 exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

524-05201101

pH 2.000 BUFFER

purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/30/11  
Jr

524-05201102

pH 4.000 BUFFER

purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

9/22/11  
Jr

524-05201103

pH 7.38 BUFFER

purchased

BDH CAT# BDH5058-500mL

LOT# 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564,  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 EXP: 9/5/11

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 EXP: 9/5/11

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426).  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 0.25  
 0.5 mL Ref 524-0151001 @  $\frac{1}{10}$  exp: 3/2012 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

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**LABORATORY REPORT**

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 23, 2011. For your reference, these analyses have been assigned our service request number P1103205.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 12:25 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103205

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 23, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103205

Date Received: 8/23/2011  
 Time Received: 16:03

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
EB-01-8/23/11	P1103205-001	Water	8/23/2011	11:20	X
SB-01-8/23/11	P1103205-002	Water	8/23/2011	11:29	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No: 1103205  
 CAS Contact: \_\_\_\_\_

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

Project Name: PL 64 MON. SOIL  
 Project Number: 5486090

P.O. # / Billing Information  
285671 / BATTLETT  
ATTN: GENALE TOMPKINS  
505 KINK AVE.  
COLUMBUS, OH 43201

Project Manager: DAVID CONNER

Phone: (619) 726-7311 Fax: (619) 458-6614

Email Address for Result Reporting: CHUCK BYRSON

Client Sample ID: SB-01-8/23/11 Laboratory ID Number: \_\_\_\_\_ Date Collected: 8/23/11 Time Collected: 1129 Matrix: SW Number of Containers: 1

Sampler (Print & Sign): CHUCK BYRSON

Analysis Method and/or Analytes	Preservative Code	Requested by (Signature)		Received by (Signature)	
		Date	Time	Date	Time
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/>					
TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/>					
TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted)					
TPH FC <input type="checkbox"/> 8015M (Subcontracted)					
Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)					
<u>CX III (7196)</u>					

Remarks: Equipment Blank  
Sample Blank

Project Requirements (MRLs, GAPP)  
 Cooler / Blank / Ice / No Ice 3  
 Temperature \_\_\_\_\_ °C

**Report Tier Levels - Please select**

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

Reinquired by (Signature): \_\_\_\_\_ Date: 8/23/11 Time: 1300 Received by (Signature): \_\_\_\_\_ Date: 8/23/11 Time: 1300

Reinquired by (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by (Signature): \_\_\_\_\_ Date: 8/23/11 Time: 1603

**Client:** Battelle

**Service Request:** P1103205

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103205-001.01	7196A	8/23/11	1633	SMO / SSTAPLES	
		8/23/11	1634	P-37 / SSTAPLES	
		8/23/11	1646	In Lab / SANDERSON	
		8/23/11	1810	P-37 / SANDERSON	
P1103205-002.01	7196A	8/23/11	1633	SMO / SSTAPLES	
		8/23/11	1634	P-37 / SSTAPLES	
		8/23/11	1646	In Lab / SANDERSON	
		8/23/11	1810	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103205  
 Project: JPL GW Mon 3Q11 / 100006114  
 Sample(s) received on: 8/23/11 Date opened: 8/23/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 3° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103205-001.01	125mL Plastic NP					
P1103205-002.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Amended project number per client instruction: \_\_\_\_\_

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103205  
Date Collected : 08/23/11  
Date Received : 08/23/11

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
EB-01-8/23/11	P1103205-001	0.010	0.003	1	NA	08/23/11 17:15	ND	
SB-01-8/23/11	P1103205-002	0.010	0.003	1	NA	08/23/11 17:15	ND	
Method Blank	P1103205-MB	0.010	0.003	1	NA	08/23/11 17:15	ND	

Approved By

*Kanu Rya*

Date :

*8/29/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103205  
**Date Analyzed:** 08/23/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 8/29/11  
ICCBMDL120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103205  
**Date Analyzed:** 08/23/11

**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	0.0500	0.0523	105	90-110
CCV1	0.0500	0.0514	103	90-110
CCV2	0.0500	0.0514	103	90-110

Approved By: Kare Rya Date: 8/29/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103205  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/23/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103205-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0418	105	90-110	

Approved By Kanu Rya

Date : 8/29/11



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103205  
Date Collected : 08/23/11  
Date Received : 08/23/11  
Date Extracted : NA  
Date Analyzed : 08/23/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : EB-01-8/23/11 Units : mg/L (ppm)  
Lab Code : P1103205-001MS P1103205-001DMS Basis : NA  
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0426	0.0426	85	85	73-119	<1	

Approved By Kam Rya Date : 8/29/11

### pH Run Log

Service Request #(s): P1103199 P1103204 P1103205

Time: 0807

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/2012	} 98.4%	—
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/2013		—
pH 10 Buffer	524-04261102	9/30/12		—

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	5,6	1.997	21.1°	P1103199-5.01 <sup>Ⓢ</sup>	6	9.337	15.6°
pH 4.000	—	3.989	21.3°	↓ -6.01 <sup>Ⓢ</sup>	↓	9.362	13.8°
pH 7.000	↓	7.016	21.3°	↓ -7.01 <sup>Ⓢ</sup>	↓	9.428	17.0°
pH 10.000	↓	10.017	21.1°	P1103204-1.01	5	1.818	13.0°
Ref#: 7196A EXP: 3/2013 524-05201102	↓	7.398	21.3°	P1103205-1.01	↓	1.874	8.2°
DI	5	2.085	21.2°	↓ -2.01	↓	1.860	9.1°
DI <sup>Ⓢ</sup>	6	9.426	21.4°	pH 2.000	5,6	2.016	21.0°
pH 10.000	5,6	10.021	21.4°				
TIME: 1445	Done						
pH 10.000	6	10.001	22.8°				
P1103199-1.01 <sup>Ⓢ</sup>	↓	9.215	19.0°				
↓ -2.01 <sup>Ⓢ</sup>	↓	9.291	20.9°				
↓ -3.01 <sup>Ⓢ</sup>	↓	9.213	20.6°				
pH 10.000	↓	10.011	21.9°				
TIME 1623	Done						
pH 10.000	5,6	10.003	21.2°				
P1103199-4.01 <sup>Ⓢ</sup>	6	9.138	15.6°				

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> AND 46284 EXP: 11/20/14

7199A: Diluted NaOH 524-04151102 EXP: 4/15/12

Comments: Ⓢ filtered prior to pH ADJUST

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

Date buffers and filling solution changed: 8/22/11

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

Analyst: [Signature]

Date: 8/23/11

Reviewer: [Signature]

Date: 8/25/11

Method EPA 7196A

Service Request#(s): P1103204 P1103205  
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12  
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/2012

Run#: 258710  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 44284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999908407
Absorbance @ 540 nm	0.000	0.010	0.057	0.113	

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	0.000426	10.003
2 ICV 0.05PPM		-	✓	0.000	0.059	0.059	0.0523	105%
3 MB		-	✓	0.000	0.000	0.000	0.000426	10.003
4 LCS 0.04PPM		-	✓	0.000	0.047	0.047	0.0418	105%
5 P1103204-1.01		-	✓	0.000	0.001	0.001	0.00130	10.003
6 -1.01 MS 0.05PPM		-	✓	0.000	0.048	0.048	0.0426	85% 2.1%
7 -1.01 MSD		-	✓	0.000	0.048	0.048	0.0426	85% 5 RPD
8 -2.01		-	✓	0.001	0.002	0.001	0.00130	10.003
9 -2.01 VS 0.03PPM		-	✓	0.001	0.030	0.029	0.0259	86%
10 P1103204-1.01		-	✓	0.000	0.002	0.002	0.00218	10.003
11 -1.01 MS 0.05PPM		-	✓	0.000	0.053	0.053	0.0470	94% 2.1%
12 -1.01 MSP		-	✓	0.000	0.053	0.053	0.0470	94% 5 RPD
13 CCV1		-	✓	0.000	0.058	0.058	0.0514	103%
14 CCV1		-	✓	0.000	0.070	0.070	0.000426	10.003
15 P1103204-1.01 VS 0.03PPM		-	✓	0.000	0.030	0.030	0.0268	89%
16 CCV2 0.05PPM		-	✓	0.000	0.058	0.058	0.0514	103%
17 CCV2		-	✓	0.000	0.070	0.070	0.000426	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 <sup>10</sup> 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 <sup>10</sup> 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of \_\_\_\_\_ <sup>10</sup> 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of \_\_\_\_\_ <sup>10</sup> 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 8/23/11 @ 1700

Date/Time: 8/23/11 @ 1715

Date: 8/25/11

10/6/10  
SA

524-10061001 25133ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
(10146598 ; Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10  
SA

524-10061002 25133ppb ION/CON for O3

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

EXP: 10/20/10

10/6/10  
SA

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; Exp 11/12

EXP: 10/7/10

10/15/10  
SA

524-10151001 Cr6+ ION/CON Stock  
Purchased 100ppm Cr6+

RICCA Chemical Co Cat No 2095-16  
500ml Plastic  
LOT # 1010177  
EXP: 3/20/12

10/15/10  
SA

524-10151002 500ppm NO2 Stock

Purchased  
RICCA Chemical Co Cat No: 5444-5-4  
LOT # 1010271 120ml amber glass

2/21/11  
JW 524-02211101 1:1 H<sub>2</sub>SO<sub>4</sub>  
250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

2/21/11  
JW 524-02211102 Carb Coloring Reagent  
0.2500g 1,5-diphenylcarbonylhydrazide (EMD lot 471039  
EXP: 4/30/13) ↑ 50 ml w/ Acetone (EMD  
lot #471540; EXP: 9/30/12).  
EXP: 3/31/11

2/28/11  
JW 524-02281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

2/28/11  
JW 524-02281102 1001<sup>19</sup>1/2 Carb  
Purchased  
Inorganic Ventures CGCR(6)1-1  
125 ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

2/28/11 524-02281103 10ppm Cr6+ Soln  
1.0 mL 524-02281102 (1000ppm Cr6+; EXP: 3/1/12) ↑  
100ml w/ DI H2O  
EXP: 2/28/12

3/7/11 524-03071101 Cr6+ Colony Reagent  
0.2500g 1,5-Diphenylcarbazide  
(EMD Lot 47103721; EXP: 1/30/13) ↑ 50ml w/  
Acetone (EMD 47154; EXP: 9/24/12).  
EXP: 4/7/11

3/7/11 524-03071102 500ppm NO2  
Purchased  
Ricca Chem Co Cat No 5444.5-4  
Lot # 1162544  
EXP: 8/20/11

3/17/11 524-03271101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
w/ DI H2O.  
EXP: 4/17/11

Reviewed And Approved By:

Initial: KL Date: 3/18/11

4/14/11 524-04141101 ICO2 Eluent  
75ml 524-04291002 (10x Conc Eluent; EXP 4/29/11)  
↑ 750ml w/ DI H2O. DEGAS  
EXP: 4/28/11

524-04261102 pH 10.000 Buffer  
4/26/11 Purchased  
SN JT Baker Cat No: 5655-01 (500ml)  
Lot # J33524  
EXP: 9/30/12

4/26/11 524-04261103 NH3 FUMING SOLN  
SN Purchased  
Thermo Orion Orion 951202 (60ml)  
Lot # OX1 P/N: 70263-A04  
EXP: 4/26/12

4/26/11 524-04261103<sup>9/4/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
SN 250 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

4/27/11 524-04271101 Ammonio Sulfuric Soln  
SN 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
2.5ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxidant (Fisher 136338613408204; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
Jr  
524-04271102 A&B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5646-500 mL  
LOT # 1163379  
EXP: 3/30/13

4/28/11  
Jr  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
Jr  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
Jr  
524-05051101 Urlet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml W/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
Jr  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent. EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O. Degassed



5/19/11  
Jr

524-0591103

PCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD <sup>JT BAKER</sup> 305641 exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

524-05201101

pH 2.000 BUFFER

purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/30/11  
Jr

524-05201102

pH 4.000 BUFFER

purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

9/22/11  
Jr

524-05201103

pH 7.38 BUFFER

purchased

BDH CAT# BDH5058-500mL

LOT# 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564,  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 SA

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 SA

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 SA  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; EXP: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426).  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 SA  
<sup>0.25</sup>  
 0.5 mL Ref 524-0151001 @  $\frac{1}{10}$  exp: 3/2012 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2011. For your reference, these analyses have been assigned our service request number P1103220.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 4:16 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / G486090

CAS Project No: P1103220

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103220

Date Received: 8/24/2011  
 Time Received: 15:51

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-14-3	P1103220-001	Water	8/24/2011	10:02	X
MW-14-2	P1103220-002	Water	8/24/2011	10:23	X
MW-14-1	P1103220-003	Water	8/24/2011	10:54	X
DUPE-02-3Q11	P1103220-004	Water	8/24/2011	00:00	X
EB-02-08/24/11	P1103220-005	Water	8/24/2011	10:40	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No. 1103220  
 CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information)  
**BRATTLE**  
 3990 Old Town Ave, #205  
 San Diego, CA 92110

Project Name  
 JPLGW. MON. 3011  
 Project # 00006114  
~~64800910~~

Project Manager  
**DAVID CONNER**

Phone 619 726-7311 Fax 619 458-6614  
 Email Address for Result Reporting \_\_\_\_\_

P.O. # / Billing Information  
285651 / BRATTLE  
 ATTN: GERALD TOMPKINS  
 505 SANDHURST KING AVE  
 COLLETON BOS, CA 93201

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Sampler (Print & Sign)
MW-14-3		8/24/11	1002	W	1	<i>[Signature]</i>
MW-14-2		8/24/11	1023	↓	1	<i>[Signature]</i>
MW-14-1		8/24/11	1054	↓	1	<i>[Signature]</i>
DUPC =		1/11		W	1	
DUPC-02-3011		8/24/11		W	1	

Analysis Method and/or Analytes	Preservative Code	
	0	1
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted)		
Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)		
CR VI (7196)		

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

**Report Tier Levels - please select**

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

MRL required Yes / No \_\_\_\_\_ MDL / POL / U required Yes / No \_\_\_\_\_  
 EDD required Yes / No \_\_\_\_\_ Type: \_\_\_\_\_

Reinquired by (Signature)	Date	Time	Received by (Signature)	Date	Time
<i>[Signature]</i>	8/24/11	1400	<i>[Signature]</i>	8/24/11	1401
<i>[Signature]</i>	8/24/11	1551	<i>[Signature]</i>	8/24/11	1551

Cooler / Blank / Ice / No Ice \_\_\_\_\_  
 Temperature \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103220

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103220-001.01	7196A	8/24/11	1614	SMO / SSTAPLES	
		8/24/11	1625	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1751	P-37 / SANDERSON	
P1103220-002.01	7196A	8/24/11	1614	SMO / SSTAPLES	
		8/24/11	1625	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1751	P-37 / SANDERSON	
P1103220-003.01	7196A	8/24/11	1614	SMO / SSTAPLES	
		8/24/11	1625	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1751	P-37 / SANDERSON	
P1103220-004.01	7196A	8/24/11	1614	SMO / SSTAPLES	
		8/24/11	1625	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1751	P-37 / SANDERSON	
P1103220-005.01	7196A	8/24/11	1614	SMO / SSTAPLES	
		8/24/11	1625	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1751	P-37 / SANDERSON	



**Sample Acceptance Check Form**

Client: Battelle Work order: P1103220

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/24/11 Date opened: 8/24/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 3° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103220-001.01	125mL Plastic NP					
P1103220-002.01	125mL Plastic NP					
P1103220-003.01	125mL Plastic NP					
P1103220-004.01	125mL Plastic NP					
P1103220-005.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Sample -005 was not listed on the COC. Information for this sample was taken from the sample container.

Analytical Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103220  
 Date Collected : 08/24/11  
 Date Received : 08/24/11

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-14-3	P1103220-001	0.010	0.003	1	NA	08/24/11 17:25	ND	
MW-14-2	P1103220-002	0.010	0.003	1	NA	08/24/11 17:25	ND	
MW-14-1	P1103220-003	0.010	0.003	1	NA	08/24/11 17:25	ND	
DUPE-02-3Q11	P1103220-004	0.010	0.003	1	NA	08/24/11 17:25	ND	
EB-02-08/24/11	P1103220-005	0.010	0.003	1	NA	08/24/11 17:25	ND	
Method Blank	P1103220-MB	0.010	0.003	1	NA	08/24/11 17:25	ND	

Approved By Kam Rya Date : 8/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103220  
**Date Analyzed:** 08/24/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 8/29/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103220  
**Date Analyzed:** 08/24/11

**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	0.0500	0.0518	104	90-110
CCV1	0.0500	0.0518	104	90-110
CCV2	0.0500	0.0518	104	90-110

Approved By: Karen Rya Date: 8/29/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103220  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/24/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103220-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0384	96	90-110	

Approved By Kanu Rya

Date : 8/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103220  
Date Collected : 08/24/11  
Date Received : 08/24/11  
Date Extracted : NA  
Date Analyzed : 08/24/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-14-3 Units : mg/L (ppm)  
Lab Code : P1103220-001MS P1103220-001DMS Basis : NA  
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0393	0.0393	79	79	73-119	<1	

Approved By Kam Rya Date : 8/29/11

# pH Run Log

Service Request #(s): P1103220 P1103223

Time: 0910

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.4%	✓
	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	56	2.009	20.8°				
pH 4.000	T	4.006	20.9°				
pH 7.000	J	7.030	21.1°				
pH 10.000	J	10.013	21.3°				
Ref#: 524-05201103	J	7.402	21.3°				
DI	5	2.092	20.8°				
DI	6	9.440	22.5°				
pH 10.000	56	10.017	21.8°				
TIME: 1650							
pH 2.000	5	2.009	20.1°				
P1103220-1.01	T	2.010	12.7°				
-2.01	J	2.001	12.6°				
-3.01	J	1.800	12.9°				
-4.01	J	1.895	13.0°				
-5.01	J	1.893	13.3°				
P1103223-1.01	J	1.916	13.9°				
pH 2.000	J	2.012	20.0°				

pH Adjustments: ~~X~~ 7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMD 49284 EXP: 11/20/14

~~X~~ 7199A: Diluted NaOH 524-04151102 EXP: 4/15/12

Comments: \_\_\_\_\_

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

Date buffers and filling solution changed: 8/22/11

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

Analyst: [Signature]

Date: 8/24/11

Reviewer: [Signature]

Date: 8/25/11

Method EPA 7196A

Service Request#(s): P1103220 P1103223  
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12  
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Run#: 258843  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999867505
Absorbance @ 540 nm	0.000	0.010	0.057	0.112	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB				0.000	0.000	0.000	0.000308	10.003
ICW 0.05PPM	10ml	-	✓	0.000	0.058	0.058	0.0518	104%
MB		-	✓	0.000	0.000	0.000	0.000308	10.003
US 0.04PPM		-	✓	0.000	0.043	0.043	0.0384	96%
P1103220-1.01		-	✓	0.000	0.000	0.000	0.000308	10.003
-1.01 MS 0.05PPM		-	✓	0.000	0.044	0.044	0.0393	79% 110%
-1.01 MSD ↓		-	✓	0.000	0.044	0.044	0.0393	79% 140%
-2.01		-	✓	0.000	0.000	0.000	0.000308	10.003
-2.01 VS 0.03PPM		-	✓	0.000	0.029	0.029	0.0260	87%
-3.01		-	✓	0.000	0.000	0.000	0.000308	10.003
-4.01		-	✓	0.000	0.000	0.000		
-5.01		-	✓	0.000	0.000	0.000		
CCV1 0.05PPM		-	✓	0.000	0.058	0.058	0.0518	104%
CCV2		-	✓	0.000	0.000	0.000	0.000308	10.003
P1103223-1.01		-	✓	0.000	0.000	0.000		
-1.01 VS 0.03PPM		-	✓	0.000	0.029	0.029	0.0260	87%
-1.01 MS 0.05PPM		-	✓	0.000	0.045	0.045	0.0402	80% 110%
-1.01 MSD ↓		-	✓	0.000	0.045	0.045	0.0402	80% 140%
CCV2		-	✓	0.000	0.058	0.058	0.0518	104%
CCV2		-	✓	0.000	0.000	0.000	0.000308	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 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 0.2 ml of \_\_\_\_\_ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/24/11 @ 1710  
 Date/Time: 8/24/11 @ 1725  
 Date: 8/25/11



10/6/10  
SA

524-10061001 25133 ppb stock for 03

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ;Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA

524-10061002 25133 ppb ION/CON for 0:

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

EXP: 10/20/10

10/6/10  
SA

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54646EK ;Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA

524-10151001 Cr6+ ION/CON Stock

Purchased 100ppm Cr6+  
FICCA Chemical Co Cut No 2095-16

500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA

524-10151002 500ppm NO<sub>2</sub> Stock

Purchased  
RECT Chemical Co Cut No: 5444-54

LOT # 1010271

120ml amber glass

524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
2/21/11  
JW 250ml H<sub>2</sub>SO<sub>4</sub> (END 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

524-0221102 Orbt Coloring Reagent  
2/21/11  
JW 0.2500g 4,5-diphenylcarbonylhydrazide (END lot 471039  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (END  
LOT # 471540; EXP: 9/24/12).  
EXP: 3/31/11

524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
2/28/11  
JW 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (END 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

524-0228102 1001 mg/L Orbt  
2/28/11  
JW purchased  
Inorganic Ventures CGCR (6)1-1  
125 ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

2/28/11  
JL  
S24-02281103 10ppm Cr<sup>6+</sup> Sol'n  
1.0 mL S24-02281102 (1000ppm Cr<sup>6+</sup>; EXP: 3/1/12) ↑  
100ml w/ DI H<sub>2</sub>O  
EXP: 2/28/12

3/7/11  
JL  
S24-03071101 Cr<sup>6+</sup> Colony Reagent  
0.2500g 1,5-Diphenylcarbazide  
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/  
Acetone (EMD 47154; EXP: 9/24/12).  
EXP: 4/7/11

3/7/11  
JL  
S24-03071102 500ppm NO<sub>2</sub>  
Purchased  
Ricca Chem Co Cat No 5444.5-4  
Lot # 1102544  
EXP: 8/20/11

3/17/11  
JL  
S24-03171101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
w/ DI H<sub>2</sub>O.  
EXP: 4/17/11

Reviewed And Approved By:

Initial: JL Date: 3/18/11

4/14/11  
JL  
S24-04141101 ICO<sub>2</sub> Eluent  
75ml S24-04291002 (10x Conc Eluent, exp 4/29/11)  
↑ 750ml w/ DI H<sub>2</sub>O. DEGAS  
EXP: 4/28/11

SN 4/26/11 524-04261102 pH 10.000 Buffer  
Purchased  
JT Baker Cat No: 5655-01 (500ml)  
LOT # J33524  
EXP: 9/30/12

SN 4/26/11 524-04261103 NH3 FUMING SOLN  
Purchased  
Thermo Orion Orion 951202 (60ml)  
LOT # 0X1 P/N: 70263-A04  
EXP: 4/26/12

SN 4/26/11 524-04261104<sup>9/4/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
250 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

SN 4/27/11 524-04271101 Amino Sulfuric Soln  
6.25 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added.  
2.5 ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxide (Fisher 1363386 13408209; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250 ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
SR  
524-04271102 A/B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1163379  
EXP: 3/20/13

4/28/11  
SR  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
SR  
524-05041101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
SR  
524-05051101 Violet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml W/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
SR  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O - Degassed

5/19/11  
JZ

S24-0591103 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker <sup>EM 305641</sup> exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
JZ

S24-05201101 pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT # 1101225

EXP: 12/2012

5/20/11  
JZ

S24-05201102 pH 4.000 BUFFER

Purchased

JT Baker CAT # 5657-01 500 mL

LOT # J36503

EXP: 9/30/12

5/22/11  
JZ

S24-05201103 pH 7.38 BUFFER

Purchased

BDH CAT # BDH5058-500 mL

LOT # 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 502564)  
 exp: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D exp: 9/24/12)  
 exp: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 exp: 9/5/11

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

exp: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 exp: 9/5/11

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

exp: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 exp: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 0.25  
 0.5 mL Ref 524-10151001 @  $\frac{0.1}{10}$  exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

exp: 9/6/11

---

## LABORATORY REPORT

August 31, 2011

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

**RE: JP-GW-3Q11 / 100006114**

Dear David:

Enclosed are the results of the sample submitted to our laboratory on August 24, 2011. For your reference, this analysis has been assigned our service request number P1103223.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 4:23 pm, Aug 31, 2011

Sue Anderson  
Project Manager



Client: Battelle  
Project: JP-GW-3Q11 / 100006114

CAS Project No: P1103223

---

## CASE NARRATIVE

The sample was received intact under chain of custody on August 24, 2011 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

---

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

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL-GW-3Q11 / 100006114

Service Request: P1103223

Date Received: 8/24/2011  
 Time Received: 15:51

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-8	P1103223-001	Water	8/24/2011	10:45	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

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



**Client:** Battelle **Service Request:** P1103223  
**Project:** JPL-GW-3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103223-001.01	7196A	8/24/11	1637	SMO / SSTAPLES	
		8/24/11	1638	P-37 / SSTAPLES	
		8/24/11	1644	In Lab / SANDERSON	
		8/24/11	1752	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103223

Project: JPL-GW-3Q11 / 100006114

Sample(s) received on: 8/24/11 Date opened: 8/24/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 3° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103223-001.01	125mL Plastic NP					

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

Analytical Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103223  
Date Collected : 08/24/11  
Date Received : 08/24/11

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-8	P1103223-001	0.010	0.003	1	NA	08/24/11 17:25	ND	
Method Blank	P1103223-MB	0.010	0.003	1	NA	08/24/11 17:25	ND	

Approved By

*Kam Rya*

Date :

*8/29/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL-GW-3Q11 / 100006114

**Service Request:** P1103223  
**Date Analyzed:** 08/24/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_\_

*Karu Rya*

Date: \_\_\_\_\_

*8/29/11*

ICCBMDL/120594



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL-GW-3Q11 / 100006114

Service Request: P1103223  
Date Analyzed: 08/24/11

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	0.0500	0.0518	104	90-110
CCV1	0.0500	0.0518	104	90-110
CCV2	0.0500	0.0518	104	90-110

Approved By: \_\_\_\_\_

*Karu Rya*

Date: \_\_\_\_\_

*8/29/11*

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103223  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/24/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103223-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0384	96	90-110	

Approved By

*Kam Rya*

Date :

*8/29/11*

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL-GW-3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103223  
**Date Collected :** 08/24/11  
**Date Received :** 08/24/11  
**Date Extracted :** NA  
**Date Analyzed :** 08/24/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-8 Units : mg/L (ppm)  
 Lab Code : P1103223-001MS P1103223-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0402	0.0402	80	80	73-119	<1	

Approved By Kam Rya Date : 8/29/11

# pH Run Log

Service Request #(s): P1103220 P1103223

Time: 0910

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.4%	✓
	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	56	2.009	20.8°				
pH 4.000	T	4.006	20.9°				
pH 7.000	J	7.030	21.1°				
pH 10.000	J	10.013	21.3°				
Ref#: 524-05201103	J	7.402	21.3°				
DI	5	2.092	20.8°				
DI	6	9.440	22.5°				
pH 10.000	56	10.017	21.8°				
TIME: 1650							
pH 2.000	5	2.009	20.1°				
P1103220-1.01	T	2.010	12.7°				
-2.01	J	2.001	12.6°				
-3.01	J	1.800	12.9°				
-4.01	J	1.895	13.0°				
-5.01	J	1.893	13.3°				
P1103223-1.01	J	1.916	13.9°				
pH 2.000	J	2.012	20.0°				

pH Adjustments: ~~X~~ 7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMD 49284 EXP: 11/20/14

~~X~~ 7199A: Diluted NaOH 524-04151102 EXP: 4/15/12

Comments: \_\_\_\_\_

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

Date buffers and filling solution changed: 8/22/11

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

Analyst: [Signature]

Date: 8/24/11

Reviewer: [Signature]

Date: 8/25/11

Service Request#(s): P1103220 P1103223

Run#: 258843

Stock#: 524-02281103 T.V.=100PPM EXP: 2/28/12

Prep Run#:

CV/CCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999867505
Absorbance @ 540 nm	0.000	0.010	0.057	0.112	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB				0.000	0.000	0.000	0.000308	10.003
ICW 0.05PPM	10ml			0.000	0.058	0.058	0.0518	104%
MB				0.000	0.000	0.000	0.000308	10.003
US 0.04PPM				0.000	0.043	0.043	0.0384	96%
P1103220-1.01				0.000	0.000	0.000	0.000308	10.003
-1.01 MS 0.05PPM				0.000	0.044	0.044	0.0393	79% 110%
-1.01 MSD ↓				0.000	0.044	0.044	0.0393	79% 84%
-2.01				0.000	0.000	0.000	0.000308	10.003
-2.01 VS 0.03PPM				0.000	0.029	0.029	0.0260	87%
-3.01				0.000	0.000	0.000	0.000308	10.003
-4.01				0.000	0.000	0.000		
-5.01				0.000	0.000	0.000		
CV1 0.05PPM				0.000	0.058	0.058	0.0518	104%
CV2				0.000	0.000	0.000	0.000308	10.003
P1103223-1.01				0.000	0.000	0.000		
-1.01 VS 0.03PPM				0.000	0.029	0.029	0.0260	87%
-1.01 MS 0.05PPM				0.000	0.045	0.045	0.0402	80% 110%
-1.01 MSD ↓				0.000	0.045	0.045	0.0402	80% 84%
CV2				0.000	0.058	0.058	0.0518	104%
CV2				0.000	0.000	0.000	0.000308	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-08221104 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.2 ml of 524-08221104 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/24/11 @ 1710  
 Date/Time: 8/24/11 @ 1725  
 Date: 8/25/11

10/6/10  
SA

524-10061001 25133 ppb stock for 03

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ;Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA

524-10061002 25133 ppb ION/CON for 0:

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

EXP: 10/20/10

10/6/10  
SA

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54646EK ;Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA

524-10151001 Cr6+ ION/CON Stock

Purchased 100ppm Cr6+  
FICCA Chemical Co Cat No 2095-16  
500ml Plastic

LOT # 1010177  
EXP: 3/20/12

10/15/10  
SA

524-10151002 500ppm NO<sub>2</sub> Stock

Purchased  
RECT Chemical Co Cat No: 5444-54  
LOT # 1010271 120ml amber glass

524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
2/21/11  
JW 250ml H<sub>2</sub>SO<sub>4</sub> (END 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

524-0221102 Orbt Coloring Reagent  
2/21/11  
JW 0.2500g 4,5-diphenylcarbonylhydrazide (END lot 471039  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (END  
LOT # 471540; EXP: 9/24/12).  
EXP: 3/31/11

524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
2/28/11  
JW 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (END 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

524-0228102 1001 mg/L Orbt  
2/28/11  
JW purchased  
Inorganic Ventures CGCR (6)1-1  
125 ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

2/28/11  
JL  
S24-02281103 10ppm Cr6+ Soln  
1.0ml S24-02281102 (1000ppm Cr6+; EXP: 3/1/12) ↑  
100ml w/ DI H2O  
EXP: 2/28/12

3/7/11  
JL  
S24-03071101 Cr6+ Colony Reagent  
0.2500g 1,5-Diphenylcarbazide  
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/  
Acetone (EMD 47154; EXP: 9/24/12).  
EXP: 4/7/11

3/7/11  
JL  
S24-03071102 500ppm NO2  
Purchased  
Ricca Chem Co Cat No 5444.5-4  
Lot # 1102544  
EXP: 8/20/11

3/17/11  
JL  
S24-03171101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
w/ DI H2O.  
EXP: 4/17/11

Reviewed And Approved By:

Initial: JL Date: 3/18/11

4/14/11  
JL  
S24-04141101 ICO2 Eluent  
75ml S24-04291002 (10x Conc Eluent, exp 4/29/11)  
↑ 750ml w/ DI H2O. DEGAS  
EXP: 4/28/11



SN 4/26/11 524-04261102 pH 10.000 Buffer  
Purchased  
JT Baker Cat No: 5655-01 (500ml)  
LOT # J33524  
EXP: 9/30/12

SN 4/26/11 524-04261103 NH3 FUMING SOLN  
Purchased  
Thermo Orion Orion 951202 (60ml)  
LOT # 0X1 P/N: 70263-A04  
EXP: 4/26/12

SN 4/26/11 524-04261103<sup>9/4/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
250 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

SN 4/27/11 524-04271101 Amino Sulfuric Soln  
6.25 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added.  
2.5 ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxide (Fisher 1363386 13408209; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250 ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
SR  
524-04271102 A/B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1163379  
EXP: 3/20/13

4/28/11  
SR  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
SR  
524-05041101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
SR  
524-05051101 Violet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml W/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
SR  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O - Degassed

5/19/11  
JZ

S24-0591103 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker <sup>EM 305641</sup> exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
JZ

S24-05201101 pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT # 1101225

EXP: 12/2012

5/20/11  
JZ

S24-05201102 pH 4.000 BUFFER

Purchased

JT Baker CAT # 5657-01 500 mL

LOT # J36503

EXP: 9/30/12

5/22/11  
JZ

S24-05201103 pH 7.38 BUFFER

Purchased

BDH CAT # BDH5058-500 mL

LOT # 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 502564)  
 exp: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D exp: 9/24/12)  
 exp: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 exp: 9/5/11

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

exp: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 exp: 9/5/11

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

exp: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 exp: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 0.25  
 0.5 mL Ref 524-10151001 @  $\frac{0.1}{10}$  exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

exp: 9/6/11

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## LABORATORY REPORT

August 31, 2011

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

**RE: JP-GW-3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 25, 2011. For your reference, these analyses have been assigned our service request number P1103244.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 4:29 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JP-GW-3Q11 / 100006114

CAS Project No: P1103244

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 25, 2011 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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL-GW-3Q11 / 10000614

Service Request: P1103244

Date Received: 8/25/2011  
 Time Received: 15:44

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-13	P1103244-001	Water	8/25/2011	08:43	X
MW-5	P1103244-002	Water	8/25/2011	11:00	X
MW-10	P1103244-003	Water	8/25/2011	13:57	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No. 17105244  
 CAS Contact:

Company Name & Address (Reporting Information) **Project Name** **Analysis Method and/or Analytes** **Preservative Code** **Preservative Key**

Battelle  
505 Kings Ave  
Columbus OH 43201  
Project Number: JPL-6W-3811  
100006114

Project Manager: David Conner  
 P.O. # / Billing Information: 285651/Battelle  
 505 Kings Ave

Phone: 614-726-7311  
 Fax: 614-458-6641  
 Columbus OH 43201

Email Address for Result Reporting: **connerd@battelle.com**  
 Sampler (Print & Sign): David Loera / Dumber

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Analysis Method and/or Analytes	Preservative Code	Remarks
MW-13		8/25/11	0843	AD	1P			
MW-5		8/25/11	1100	AD	1P			
MW-10		8/25/11	1357	AD	1P			
						Hexavalent Cr 7196	XXX	

**Report Tier Levels - please select**

Tier I - (Results/Default if not specified) \_\_\_\_\_ Tier III - (Data Validation Package) 10% Surcharge  MRL required Yes / No MDL / PCL / J required Yes / No EDD required (Yes) No Type: \_\_\_\_\_

Tier II - (Results + QC) \_\_\_\_\_ Tier V - (client specified) \_\_\_\_\_

Reinquished by: (Signature) *[Signature]* Date: *[Date]* Time: *[Time]*

Reinquished by: (Signature) *[Signature]* Date: *[Date]* Time: *[Time]*

Reinquished by: (Signature) *[Signature]* Date: *[Date]* Time: *[Time]*

Reinquished by: (Signature) *[Signature]* Date: *[Date]* Time: *[Time]*

Cooler / Blank / Ice / No Ice  
 Temperature \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103244

**Project:** JPL-GW-3Q11/10000614

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103244-001.01	7196A	8/25/11	1548	SMO / SSTAPLES	
		8/25/11	1548	P-37 / SSTAPLES	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1730	P-37 / SANDERSON	
P1103244-002.01	7196A	8/25/11	1548	SMO / SSTAPLES	
		8/25/11	1548	P-37 / SSTAPLES	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1730	P-37 / SANDERSON	
P1103244-003.01	7196A	8/25/11	1548	SMO / SSTAPLES	
		8/25/11	1548	P-37 / SSTAPLES	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1730	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103244

Project: JPL-GW-3Q11 / 10000614

Sample(s) received on: 8/25/11 Date opened: 8/25/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103244-001.01	125mL Plastic NP					
P1103244-002.01	125mL Plastic NP					
P1103244-003.01	125mL Plastic NP					

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL-GW-3Q11  
Project Number : 10000614  
Sample Matrix : WATER

Service Request : P1103244  
Date Collected : 08/25/11  
Date Received : 08/25/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-13	P1103244-001	0.01	0.003	1	NA	08/25/11 17:05	0.006	J
MW-5	P1103244-002	0.01	0.003	1	NA	08/25/11 17:05	ND	
MW-10	P1103244-003	0.01	0.003	1	NA	08/25/11 17:05	ND	
Method Blank	P1103244-MB	0.01	0.003	1	NA	08/25/11 17:05	ND	

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

Approved By Kam Rya Date : 8/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL-GW-3Q11 / 100006114

**Service Request:** P1103244  
**Date Analyzed:** 08/25/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Karu Rya Date: 8/29/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL-GW-3Q11 / 100006114

**Service Request:** P1103244  
**Date Analyzed:** 08/25/11

**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	0.0500	0.0521	104	90-110
CCV1	0.0500	0.0512	102	90-110
CCV2	0.0500	0.0512	102	90-110

Approved By: Kanu Rya Date: 8/29/11  
CCV1A/120594

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL-GW-3Q11  
**Project Number :** 10000614  
**Sample Matrix :** WATER

**Service Request :** P1103244  
**Date Collected :** NA  
**Date Received :** NA  
**Date Extracted :** NA  
**Date Analyzed :** 08/25/11

Laboratory Control Sample Summary  
 Inorganic Parameters

**Sample Name :** Laboratory Control Sample  
**Lab Code :** P1103244-LCS  
**Test Notes :**

**Units :** mg/L (ppm)  
**Basis :** NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0404	101	90-110	

Approved By

*Kam Rya*

Date :

*8/29/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL-GW-3Q11  
 Project Number : 10000614  
 Sample Matrix : WATER

Service Request : P1103244  
 Date Collected : 08/25/11  
 Date Received : 08/25/11  
 Date Extracted : NA  
 Date Analyzed : 08/25/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-13  
 Lab Code : P1103244-001MS  
 Test Notes :

P1103244-001DMS

Units : mg/L (ppm)  
 Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.01	0.0500	0.0500	0.0056	0.0467	0.0476	82	84	73-119	2	J

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

Approved By Kam Ryan Date : 8/29/11



### pH Run Log

Service Request #(s): P1103244 P1103245

Time: 0734

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.0%	—
	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	1.995	20.2
pH 4.000	—	4.012	20.9
pH 7.000	—	7.009	21.0°
pH 10.000	—	10.015	21.0°
TIME: 7:30 EXP: 3/2013 Reff#: 524-05201102	—	7.400	21.5°
DI	—	2.049	21.3°
pH 2.000	—	1.993	20.2°
TIME: 1630	—	—	—
pH 2.000	5	2.013	22.0°
P1103244-1.01	—	2.019	13.3°
J -2.01	—	1.807	12.9°
J -3.01	—	1.871	13.3°
P1103245-1.01	—	1.977	12.5°
J -2.01	—	1.823	13.1°
J -3.01	—	1.801	13.9°
J -4.01	—	1.796	14.1°
J -5.01	—	2.086	13.9°

Sample	#	pH	Temp. °C
P1103245-6.01	5	1.869	14.4°
J -7.01	—	1.785	14.7°
pH 2.000	—	2.022	21.8°
P1103245-8.01	—	1.917	15.1°
pH 2.000	—	2.022	21.7°
SEARCHED / INDEXED			

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> P11044284 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: 8/22/11

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

Analyst: SR

Date: 8/25/11

Reviewer: KR

Date: 8/26/11

Method EPA 7196A

Service Request#(s): P1103244 P1103245 Run#: 249092  
 Stock#: 524-02281103 T.V.=100PPM EXP: 2/08/12 Prep Run#:             
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/30/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-05221104 EXP 9/22/11

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	0.99952401
Absorbance @ 540 nm	0.000	0.011	0.065	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	0.000245	10.003
2	ICV 0.05PPM	-	-	✓ 0.000	0.058	0.058	0.0521	104%
3	MB	-	-	✓ 0.000	0.000	0.000	0.000215	10.003
4	LCS 0.04PPM	-	-	✓ 0.000	0.045	0.045	0.0404	101%
5	P1103244-1.01	-	-	✓ 0.000	0.006	0.006	0.00561	87%
6	-1.01 MS 0.05PPM	-	-	✓ 0.000	0.052	0.052	0.0467	82%
7	-1.01 MSD ↓	-	-	✓ 0.000	0.053	0.053	0.0476	84%
8	-2.01	-	-	✓ 0.000	0.000	0.000	0.000245	10.003
9	-2.01 VS 0.05PPM	-	-	✓ 0.000	0.029	0.029	0.0262	87%
10	✓ -3.01	-	-	✓ 0.001	0.002	0.001	0.00114	10.003
11	P1103245-1.01	-	-	✓ 0.003	0.004	0.001	0.00114	10.003
12	↓ -1.01 VS 1.03PPM	-	-	✓ 0.003	0.029	0.029	0.0262	87%
13	CCV1 0.05PPM	-	-	✓ 0.000	0.057	0.057	0.0512	102%
14	CCV1	-	-	✓ 0.000	0.000	0.000	0.000245	10.003
15	P1103245-2.01	-	-	✓ 0.005	0.006	0.001	0.00114	10.003
16	↓ -2.01 MS 0.05PPM	-	-	✓ 0.005	0.053	0.048	0.0431	86%
17	↓ -2.01 MSD ↓	-	-	✓ 0.005	0.053	0.048	0.0431	86%

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

ICV/CCV spiked with 0.25 ml of 524-10151001 (10%) \* 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 \* 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 ml of sample (T.V. = 0.02 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/25/11 @ 1050  
 Date/Time: 8/25/11 @ 1705  
 Date: 8/26/11



10/6/10  
SW524-10061001 25133ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061002 25133ppb ION/COV for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
(IGINC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061003 MBTH Sol'n0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 49284; EXP 11/2

EXP: 10/7/10

10/15/10  
SW524-10151001 Cr6+ ION/COV StockPurchased 100ppm Cr6+  
Ricca Chemical Co Cut No 2095-16

500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SW524-10151002 500ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cut No: 5444.5-4

LOT # 1010271

120ml amber glass

2/21/11 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 JG 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/11)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11 524-0221102 Cr6+ Coloring Reagent  
 JG 0.2500g 1,5-diphenylcarbonylhydrazide (EMD lot 47103;  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 lot #47154D; EXP: 9/24/12).  
 EXP: 3/31/11

2/28/11 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 JG 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11 524-0228102 1001 mg/L Cr6+  
 JG Purchased  
 Inorganic Ventures CGCR (6)1-1  
 125ml Clear Glass  
 LOT# D2-CR03040  
 EXP: 3/1/2012

2/28/11  
 JZ  
 S24-02281103 10ppm Cr6+ Soln  
 1.0 ml S24-02281102 (1000 ppm Cr6+; EXP: 3/1/12) ↑  
 100ml w/ DI H2O  
 EXP: 2/28/12

3/7/11  
 JZ  
 S24-03071101 Cr6+ Coloring Reagent  
 0.2500g 1,5-Diphenylcarbohydrazide  
 (EMD Lot 47103721, EXP: 1/30/12) ↑ 50 ml w/  
 Acetone (EMD 47154; EXP: 9/24/12).  
 EXP: 4/7/11

3/7/11  
 JZ  
 S24-03071102 500ppm NO2  
 Purchased  
 RICCA Chem Co Cat No 5444.5-4  
 Lot # 1162544  
 EXP: 8/20/11

3/17/11  
 JZ  
 S24-03271101 Alkaline Digestion Soln  
 20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
 Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
 w/ DI H2O.  
 EXP: 4/17/11

Reviewed And Approved By:

Initial: KL Date: 3/18/11

4/14/11  
 JZ  
 S24-04141101 ICO2 Eluent  
 75ml S24-04291002 (10x Conc Eluent, exp 4/29/11)  
 ↑ 750ml w/ DI H2O. DEGAS  
 EXP: 4/28/11

524-04261102 pH 10.000 Buffer  
 4/26/11 SN Purchased  
 JT Baker Cat No: 5655-01 (500)  
 Lot # J33524  
 EXP: 9/30/12

4/26/11 SN 524-04261103 NH3 Fixing Soln  
 Purchased  
 Thermo Orion Orion 951202 (60M)  
 Lot # OX1 P/N: 70263-A04  
 EXP: 4/26/12

4/26/11 SN 524-04261103<sup>4/26/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

4/27/11 SN 524-04271101 Amine Sulfuric Soln  
 6.25 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
 2.5 ml DI H<sub>2</sub>O. Let Cool.  
 DISSOLVE 1.6875g N,N-dimethyl-p-phenylenediamine  
 oxalate (Fluka 1363386 B408200; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250 ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
 EXP: 5/25/11

4/27/11  
JA  
524-04271102 A/B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1103379  
EXP: 3/30/13

4/28/11  
JA  
524-04281101 0.1N H2SO4  
5.6 ml conc H2SO4 (EMD 49284; EXP: 11/20/14)  
↑ 2L w/DI H2O  
EXP: 4/28/12

5/4/11  
JA  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na2CO3 (EMD 46321715B; EXP: 10/11/12)  
↑ 1L w/DI H2O  
EXP: 06/04/11

6/6/11  
JA  
524-05051101 Crat Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
JA  
524-05051102 ICO2 Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L w/DI H2O - Degassed



5/19/11  
Jr524-0591103

IC02 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker  
EM 305641 exp: 4/15/16) in 100 mL Methanol (B&J A0806 exp: 5/13/16).  
Add to 1 L volumetric flask containing 500 mL DI water +  
5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring  
up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr524-05201101

pH 2.000 BUFFER

purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/30/11  
Jr524-05201102

pH 4.000 BUFFER

purchased

JT Baker CAT# 5657-01 500 mL

LOT# J36503

EXP: 9/30/12

9/22/11  
Jr524-05201103

pH 7.38 BUFFER

purchased

BDH CAT# BDH5058-500 mL

LOT# 1103361

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; J0564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D EXP: 9/24/10)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> ION/CA  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> ION/CA  
 0.25 mL Ref 524-0151001 @  $\frac{0.1}{10}$  exp: 3/2012 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 25, 2011. For your reference, these analyses have been assigned our service request number P1103245.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 4:33 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103245

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 25, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103245

Date Received: 8/25/2011  
 Time Received: 15:44

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-17-4	P1103245-001	Water	8/25/2011	08:51	X
MW-17-3	P1103245-002	Water	8/25/2011	09:23	X
MW-17-2	P1103245-003	Water	8/25/2011	09:53	X
EB-03-8/25/11	P1103245-004	Water	8/25/2011	09:42	X
MW-18-4	P1103245-005	Water	8/25/2011	11:44	X
MW-18-3	P1103245-006	Water	8/25/2011	12:13	X
MW-18-2	P1103245-007	Water	8/25/2011	12:51	X
DUPE-03-3Q11	P1103245-008	Water	8/25/2011	00:00	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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

**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. P10324K  
CAS Contact:

Company Name & Address (Reporting Information) **Project Name**  
**BAYTELLE** **SPL. GW MON. 3A11**

3990 OLD TOWN AVE. C-205 **Project Number**  
 SAN DIEGO, CA 92110 **100806114**

Project Manager: **DAVID COWEN** **PO # / Billing Information**  
**2856ST1 / BAYTELLE**

Phone: **(619) 726-7311** Fax: **(619) 458-6614** **ATTN: GERALD TEMPLEMS**  
**505 KING AVE.**  
**COLUMBUS, OH 43201**

Email Address for Result Reporting: **Phase 1** **Phase 2** **Phase 3** **Phase 4**

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS	TPH Gas 8015B	BTEX 8021B	MTBE 8021B	TPH Diesel 8015B	TPH Diesel Low Level 8015B	TPH FC	Semi-Volatile Organics GC/MS	Preservative Code	Remarks
MW-17-4	1	8/25/11	0851	W	1										
MW-17-3	2	8/25/11	0923	W	2										MMS / MSD
MW-17-2	3	8/25/11	0953	W	1										
EB-03-8/25/11	4	8/25/11	0942	W	1										see impoundment blank

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

Requisitioned by: (Signature) [Signature] Date: 8/25/11 Time: 1500  
 Received by: (Signature) [Signature] Date: 8/25/11 Time: 1500

Requisitioned by: (Signature) [Signature] Date: 8/25/11 Time: 1500  
 Received by: (Signature) [Signature] Date: 8/25/11 Time: 1500

Requisitioned by: (Signature) [Signature] Date: 8/25/11 Time: 1500  
 Received by: (Signature) [Signature] Date: 8/25/11 Time: 1500

Project Requirements (MRLs, QAPP)  
 Cooler / Blank / Ice / No Ice Water  
 Temperature 20 °C



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

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

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

CAS Project No. 91103245  
 CAS Contact:

Company Name & Address (Reporting Information)		Project Name		Analysis Method and/or Analytes		Preservative Code		Preservative Key	
<b>BATTELLE</b> 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110		SPL. CIV. NOV. 3811 Project Number 10006114 <del>6486098</del>		PO # / Billing Information 285651 / BATTELLE ATTN: GENERAL TEMPLIKUS 505 LINCOLN AVE. COLUMBUS, OH 43201		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)		0 None 1 HCL 2 HNO3 3 H2SO4 4 NaOH 5 Zn Acetate 6 Asc Acid 7 Other	
Project Manager DAVID CONNER		Project # / Billing Information		Analysis Method and/or Analytes		Preservative Code		Preservative Key	
Phone (619) 726-7311 Fax (619) 468-6614		Sampler (Print & Sign) <i>[Signature]</i>		Analysis Method and/or Analytes		Preservative Code		Preservative Key	
Email Address for Result Reporting		Laboratory ID Number		Date Collected		Time Collected		Matrix	
Client Sample ID		Date Collected		Time Collected		Matrix		Number of Containers	
MW - 18 - 4		8/25/11		1144		W		1	
MW - 18 - 3		8/25/11		1213		W		1	
MW - 18 - 2		8/25/11		1251		W		1	
DUPE - 1/11		8/25/11		W		W		1	
DUPE - 03-3011		8/25/11		W		W		1	

**Report Tier Levels - please select**

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

MRL required Yes / No \_\_\_\_\_ EDD required Yes / No \_\_\_\_\_  
 MDL / PQL / J required Yes / No \_\_\_\_\_ Type: \_\_\_\_\_

Reinquired by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50  
 Received by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50

Reinquired by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50  
 Received by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50

Reinquired by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50  
 Received by: (Signature) *[Signature]* Date: 8/25/11 Time: 1:50

Project Requirements (MRLs, QAPP)

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



**Client:** Battelle

**Service Request:** P1103245

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103245-001.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-002.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-002.02		8/25/11	1549	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-003.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-004.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-005.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-006.01	7196A	8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
P1103245-007.01	7196A				

**Client:** Battelle

**Service Request:** P1103245

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	
<hr/>					
P1103245-008.01	7196A				
		8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11	1619	In Lab / SANDERSON	
		8/25/11	1731	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103245

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/25/11 Date opened: 8/25/11 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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103245-001.01	125mL Plastic NP					
P1103245-002.01	125mL Plastic NP					
P1103245-002.02	125mL Plastic NP					
P1103245-003.01	125mL Plastic NP					
P1103245-004.01	125mL Plastic NP					
P1103245-005.01	125mL Plastic NP					
P1103245-006.01	125mL Plastic NP					
P1103245-007.01	125mL Plastic NP					

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



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103245  
**Date Collected :** 08/25/11  
**Date Received :** 08/25/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-17-4	P1103245-001	0.010	0.003	1	NA	08/25/11 17:05	ND	
MW-17-3	P1103245-002	0.010	0.003	1	NA	08/25/11 17:05	ND	
MW-17-2	P1103245-003	0.010	0.003	1	NA	08/25/11 17:05	ND	
EB-03-8/25/11	P1103245-004	0.010	0.003	1	NA	08/25/11 17:05	ND	
MW-18-4	P1103245-005	0.010	0.003	1	NA	08/25/11 17:05	ND	
MW-18-3	P1103245-006	0.010	0.003	1	NA	08/25/11 17:05	ND	
MW-18-2	P1103245-007	0.010	0.003	1	NA	08/25/11 17:05	ND	
DUPE-03-3Q11	P1103245-008	0.010	0.003	1	NA	08/25/11 17:05	ND	
Method Blank	P1103245-MB	0.010	0.003	1	NA	08/25/11 17:05	ND	

Approved By                     *Kam Rya*                    

Date :                     *8/29/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103245  
**Date Analyzed:** 08/25/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_\_

*Kanu Rya*

Date: \_\_\_\_\_

*8/29/11*

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103245  
**Date Analyzed:** 08/25/11

**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	0.0500	0.0521	104	90-110
CCV1	0.0500	0.0512	102	90-110
CCV2	0.0500	0.0512	102	90-110

Approved By: Kanu Rya Date: 8/29/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103245  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/25/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103245-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0404	101	90-110	

Approved By

*Kare Rya*

Date :

*8/29/11*



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103245  
 Date Collected : 08/25/11  
 Date Received : 08/25/11  
 Date Extracted : NA  
 Date Analyzed : 08/25/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-17-3 Units : mg/L (ppm)  
 Lab Code : P1103245-002MS P1103245-002DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0431	0.0431	86	86	73-119	<1	

Approved By Kanu Rya

Date : 8/29/11

### pH Run Log

Service Request #(s): P1103244 P1103245

Time: 0734

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.0%	—
	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	1.995	20.2
pH 4.000	—	4.012	20.9
pH 7.000	—	7.009	21.0°
pH 10.000	—	10.015	21.0°
TIME: 7:30 EXP: 3/2013 Ref#: 524-05201102	—	7.400	21.5°
DI	—	2.049	21.3°
pH 2.000	—	1.993	20.2°
TIME: 1630	—	—	—
pH 2.000	5	2.013	22.0°
P1103244-1.01	—	2.019	13.3°
J -2.01	—	1.807	12.9°
J -3.01	—	1.871	13.3°
P1103245-1.01	—	1.977	12.5°
J -2.01	—	1.823	13.1°
J -3.01	—	1.801	13.9°
J -4.01	—	1.796	14.1°
J -5.01	—	2.086	13.9°

Sample	#	pH	Temp. °C
P1103245-6.01	5	1.869	14.4°
J -7.01	—	1.785	14.7°
pH 2.000	—	2.022	21.8°
P1103245-8.01	—	1.917	15.1°
pH 2.000	—	2.022	21.7°
SEARCHED / INDEXED			

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> P11044284 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: 8/22/11

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

Analyst: SR

Date: 8/25/11

Reviewer: KR

Date: 8/26/11

Method EPA 7196A

Service Request#(s): P1103244 P1103245 Run#: 249092  
 Stock#: 524-02281103 T.V.=100PPM EXP: 2/08/12 Prep Run#:           
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-05221104 EXP 9/22/11

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	0.99952401
Absorbance @ 540 nm	0.000	0.011	0.065	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	0.000245	10.003
2	ICV 0.05PPM	-	-	✓ 0.000	0.058	0.058	0.0521	104%
3	MB	-	-	✓ 0.000	0.000	0.000	0.000215	10.003
4	LCS 0.04PPM	-	-	✓ 0.000	0.045	0.045	0.0404	101%
5	P1103244-1.01	-	-	✓ 0.000	0.006	0.006	0.00561	87%
6	-1.01 MS 0.05PPM	-	-	✓ 0.000	0.052	0.052	0.0467	82%
7	-1.01 MSD ↓	-	-	✓ 0.000	0.053	0.053	0.0476	84%
8	-2.01	-	-	✓ 0.000	0.000	0.000	0.000245	10.003
9	-2.01 VS 0.05PPM	-	-	✓ 0.000	0.029	0.029	0.0262	87%
10	✓ -3.01	-	-	✓ 0.001	0.002	0.001	0.00114	10.003
11	P1103245-1.01	-	-	✓ 0.003	0.004	0.001	0.00114	10.003
12	↓ -1.01 VS 1.03PPM	-	-	✓ 0.003	0.029	0.029	0.0262	87%
13	CCV1 0.05PPM	-	-	✓ 0.000	0.057	0.057	0.0512	102%
14	CCV1	-	-	✓ 0.000	0.000	0.000	0.000245	10.003
15	P1103245-2.01	-	-	✓ 0.005	0.006	0.001	0.00114	10.003
16	↓ -2.01 MS 0.05PPM	-	-	✓ 0.005	0.053	0.048	0.0431	86%
17	↓ -2.01 MSD ↓	-	-	✓ 0.005	0.053	0.048	0.0431	86%

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

ICV/CCV spiked with 0.25 ml of 524-10151001 (10%) \* 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 \* 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 ml of sample (T.V. = 0.02 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/25/11 @ 1050  
 Date/Time: 8/25/11 @ 1705  
 Date: 8/26/11

Method EPA 7196A

Service Request#(s): P1103244 P1103245 Run#: 259032  
 Stock#: 524-02281103 T.V. = 100ppm EXP: 2/28/12 Prep Run#: \_\_\_\_\_  
 CVICCV#: 524-10151001 T.V. = 100ppm EXP: 3/30/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 4/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

Working Curve:

Prep Dilution	N3	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.9995040
Absorbance @ 540 nm	0.000	0.011	0.055	0.112	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
P1103245-3.01	10ml	—	✓	0.000	0.000	0.000	10.003	
—4.01	—	—	✓	0.001	0.001	0.000	0.000345	10.003
—5.01	—	—	✓	0.000	0.001	0.001	0.00114	—
—6.01	—	—	✓	0.000	0.000	0.000	0.000245	—
—7.01	—	—	✓	0.000	0.000	0.000	—	—
—8.01	—	—	✓	0.000	0.000	0.000	—	—
MRL CHECK 0.01 PPM	—	—	✓	0.000	0.010	0.010	0.00918	92%
CV2 0.05 PPM	—	—	✓	0.000	0.057	0.057	0.0512	102%
CV2	—	—	✓	0.000	0.000	0.000	0.000245	10.003
Space not used								

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment  
 ICV/CCV spiked with 0.25 ml of 524-10151001 ↑ 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)  
 MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 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 ml of sample (T.V. = 0.3 ppm)

Comments: \_\_\_\_\_

Prepared By: [Signature] Date/Time: 8/25/11 @ 1650  
 Analyzed By: [Signature] Date/Time: 8/25/11 @ 1705  
 Reviewed By: [Signature] Date: 8/26/11

10/6/10  
SW524-10061001 25133ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061002 25133ppb ION/COV for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
(IGINC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061003 MBTH Sol'n0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 49284; EXP 11/2

EXP: 10/7/10

10/15/10  
SW524-10151001 Cr6+ ION/COV StockPurchased 100ppm Cr6+  
Ricca Chemical Co Cut No 2095-16  
500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SW524-10151002 500ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cut No: 5444.5-4  
LOT # 1010271 120ml amber glass

2/21/11 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 JG 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/11)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11 524-0221102 Cr6+ Coloring Reagent  
 JG 0.2500g 1,5-diphenylcarbonylhydrazide (EMD lot 47103;  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 lot #47154D; EXP: 9/24/12).  
 EXP: 3/31/11

2/28/11 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 JG 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11 524-0228102 1001 mg/L Cr6+  
 JG Purchased  
 Inorganic Ventures CGCR (6)1-1  
 125ml Clear Glass  
 LOT# D2-CR03040  
 EXP: 3/1/2012

2/28/11  
 JZ  
 S24-02281103 10ppm Cr6+ Soln  
 1.0 ml S24-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑  
 100ml w/ DI H2O  
 EXP: 2/28/12

3/7/11  
 JZ  
 S24-03071101 Cr6+ Coloring Reagent  
 0.2500g 1,5-Diphenylcarbohydrazide  
 (EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/  
 Acetone (EMD 47154, EXP: 9/24/12).  
 EXP: 4/7/11

3/7/11  
 JZ  
 S24-03071102 500ppm NO2  
 Purchased  
 RICCA Chem Co Cat No 5444.5-4  
 Lot # 1162544  
 EXP: 8/2011

3/17/11  
 JZ  
 S24-03271101 Alkaline Digestion Soln  
 20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g  
 Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L  
 w/ DI H2O.  
 EXP: 4/17/11

Reviewed And Approved By:

Initial: KL Date: 3/18/11

4/14/11  
 JZ  
 S24-04141101 ICO2 Eluent  
 75ml S24-04291002 (10x Conc Eluent, exp 4/29/11)  
 ↑ 750ml w/ DI H2O. DEGAS  
 EXP: 4/28/11

524-04261102 pH 10.000 Buffer  
 4/26/11 SN Purchased  
 JT Baker Cat No: 5655-01 (500)  
 Lot # J33524  
 EXP: 9/30/12

4/26/11 SN 524-04261103 NH3 Fixing Soln  
 Purchased  
 Thermo Orion Orion 951202 (60M)  
 Lot # OX1 P/N: 70263-A04  
 EXP: 4/26/12

4/26/11 SN 524-04261103<sup>4/26/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

4/27/11 SN 524-04271101 Amine Sulfuric Soln  
 6.25 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
 2.5 ml DI H<sub>2</sub>O. Let Cool.  
 Dissolve 1.6875g N,N-dimethyl-p-phenylenediamine  
 oxalate (Fluka 1363386 B408200; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250 ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
 EXP: 5/25/11



4/27/11  
Jr  
524-04271102 A/B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1103379  
EXP: 3/30/13

4/28/11  
Jr  
524-04281101 0.1N H2SO4  
5.6 ml conc H2SO4 (EMD 49284; EXP: 11/20/14)  
↑ 2L w/ DI H2O  
EXP: 4/28/12

5/4/11  
Jr  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na2CO3 (EMD 46321715B; EXP: 10/11/12)  
↑ 1L w/ DI H2O  
EXP: 06/04/11

6/6/11  
JA  
524-05051101 Cryst Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05041;  
EXP: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
Jr  
524-05051102 IC02 Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L w/ DI H2O - Degassed

5/19/11  
Jr524-05191103

IC02 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker  
EM 305641 exp: 4/15/16) in 100 mL Methanol (B&J A0806 exp: 5/13/16).  
Add to 1 L volumetric flask containing 500 mL DI water +  
5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring  
up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr524-05201101

pH 2.000 BUFFER

purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/30/11  
Jr524-05201102

pH 4.000 BUFFER

purchased

JT Baker CAT# 5657-01 500 mL

LOT# J36503

EXP: 9/30/12

5/22/11  
Jr524-05201103

pH 7.38 BUFFER

purchased

BDH CAT# BDH5058-500 mL

LOT# 1103361

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; J0564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D EXP: 9/24/10  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 SA

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 SA

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 SA  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 SA  
<sup>0.25</sup>  
~~0.5~~ mL Ref 524-0151001 @  $\frac{0.1}{10}$  exp: 3/2012 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 26, 2011. For your reference, these analyses have been assigned our service request number P1103256.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 4:59 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103256

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 26, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103256

Date Received: 8/26/2011  
 Time Received: 12:40

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-23-4	P1103256-001	Water	8/26/2011	09:33	X
MW-23-3	P1103256-002	Water	8/26/2011	09:55	X
MW-23-2	P1103256-003	Water	8/26/2011	10:16	X
MW-23-1	P1103256-004	Water	8/26/2011	10:43	X
EB-04-8/26/11	P1103256-005	Water	8/26/2011	10:33	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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

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: 1103256  
CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information)  
**BATTELLE**  
 3900 BLDG TOWN AVE. C-205  
 SAN DIEGO, CA 92110

Project Name  
 JPL. GW. MON. 3011

Project Number  
 10006114

Project Manager  
**DAVID CONNEN**

PO. # / Billing Information  
 285651 / BATTELLE  
 ATTN: GERALD TOMPKINS  
 505 KING AVE  
 COLUMBOS, OH 43201

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

Phone (619) 726-7311 Fax 619-458-6614  
 Email Address for Result Reporting  
*David Connen*

Client Sample ID  
 MW-23-4  
 MW-23-3  
 MW-23-2  
 MW-23-1  
 EB-DI-8/24/11

Laboratory ID Number  
 1  
 2  
 3  
 4  
 5

Date Collected  
 8/25/11  
 8/26/11  
 8/26/11  
 8/26/11  
 8/26/11

Time Collected  
 0933  
 0955  
 1016  
 1043  
 1033

Matrix  
 W  
 W  
 W  
 W  
 W

Number of Containers  
 1  
 1  
 1  
 1  
 1

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS		Semi-Volatile Organics GC/MS		Preservative Code	Remarks
						624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/>	TPH Gas 8015B <input type="checkbox"/>	BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/>	TPH Diesel 8015B <input type="checkbox"/> (Subcontracted)		
MW-23-4	1	8/25/11	0933	W	1						
MW-23-3	2	8/26/11	0955	W	1						
MW-23-2	3	8/26/11	1016	W	1						
MW-23-1	4	8/26/11	1043	W	1						
EB-DI-8/24/11	5	8/26/11	1033	W	1						

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, GAPP)  
 Cooler Blank / Ice / No Ice \_\_\_\_\_  
 Temperature \_\_\_\_\_ °C

Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_



**Client:** Battelle

**Service Request:** P1103256

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103256-001.01	7196A	8/26/11	1308	SMO / SSTAPLES	
		8/26/11	1309	P-37 / SSTAPLES	
		8/26/11	1339	In Lab / SANDERSON	
		8/26/11	1501	P-37 / SANDERSON	
P1103256-002.01	7196A	8/26/11	1308	SMO / SSTAPLES	
		8/26/11	1309	P-37 / SSTAPLES	
		8/26/11	1339	In Lab / SANDERSON	
		8/26/11	1501	P-37 / SANDERSON	
P1103256-003.01	7196A	8/26/11	1308	SMO / SSTAPLES	
		8/26/11	1309	P-37 / SSTAPLES	
		8/26/11	1339	In Lab / SANDERSON	
		8/26/11	1501	P-37 / SANDERSON	
P1103256-004.01	7196A	8/26/11	1308	SMO / SSTAPLES	
		8/26/11	1309	P-37 / SSTAPLES	
		8/26/11	1339	In Lab / SANDERSON	
		8/26/11	1501	P-37 / SANDERSON	
P1103256-005.01	7196A	8/26/11	1308	SMO / SSTAPLES	
		8/26/11	1309	P-37 / SSTAPLES	
		8/26/11	1339	In Lab / SANDERSON	
		8/26/11	1501	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103256

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/26/11 Date opened: 8/26/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103256-001.01	125mL Plastic NP					
P1103256-002.01	125mL Plastic NP					
P1103256-003.01	125mL Plastic NP					
P1103256-004.01	125mL Plastic NP					
P1103256-005.01	125mL Plastic NP					

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103256  
Date Collected : 08/26/11  
Date Received : 08/26/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-4	P1103256-001	0.010	0.003	1	NA	08/26/11 14:40	ND	
MW-23-3	P1103256-002	0.010	0.003	1	NA	08/26/11 14:40	ND	
MW-23-2	P1103256-003	0.010	0.003	1	NA	08/26/11 14:40	ND	
MW-23-1	P1103256-004	0.010	0.003	1	NA	08/26/11 14:40	ND	
EB-04-8/26/11	P1103256-005	0.010	0.003	1	NA	08/26/11 14:40	ND	
Method Blank	P1103256-MB	0.010	0.003	1	NA	08/26/11 14:40	ND	

Approved By Kam Rya

Date : 8/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103256  
**Date Analyzed:** 08/26/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND

Approved By: Kanu Rya Date: 8/29/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103256  
**Date Analyzed:** 08/26/11

**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	0.0500	0.0513	103	90-110
CCV1	0.0500	0.0513	103	90-110

Approved By: Karu Rya Date: 8/29/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103256  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/26/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103256-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By Kanu Rya Date : 8/29/11

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103256  
 Date Collected : 08/26/11  
 Date Received : 08/26/11  
 Date Extracted : NA  
 Date Analyzed : 08/26/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-23-4 Units : mg/L (ppm)  
 Lab Code : P1103256-001MS P1103256-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0504	0.0504	101	101	73-119	<1	

Approved By Kam Rya Date : 8/29/11

# pH Run Log

Service Request #(s): P1103256

Time: 1000

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/20/12	} 98.2%	_____
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/30/13		_____
pH 10 Buffer	524-04261102	9/30/12		_____

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	2.000	20.8°	/			
pH 4.000		4.015	21.0°				
pH 7.000		7.014	21.1°				
pH 10.000		10.007	21.2°				
RV-1.38 EXP: 3/20/13 Ref#: 524-05201103		7.388	21.4°				
DE		2.039	20.1°				
pH 2.000		2.004	20.8°				
TIME: 1400							
pH 2.000	5	2.000	21.4°				
P1103256-1.01		2.000	15.8°				
-2.01		1.815	15.7°				
-3.01		2.018	15.8°				
-4.01		1.904	16.3°				
-5.01		1.810	16.2°				
pH 2.000		2.004	20.8°				

space not used

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> DMD 44784 EXP: 8/11/20/14

7199A: Diluted NaOH \_\_\_\_\_ EXP: 8/26/11

Comments: \_\_\_\_\_

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

Date buffers and filling solution changed: 8/22/11

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

Analyst: [Signature]  
Reviewer: [Signature]

Date: 8/26/11  
Date: 8/26/11



Service Request#(s): P1103256

Run#: 259212

Stock#: 524-02281103 T.V.=10ppm EXP: 2/28/12

Prep Run#:

CV/CCV#: 524-10151001 T.V.=100ppm EXP: 3/20/12

Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 44284 EXP: 11/02/14

Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999973595
Absorbance @ 540 nm	0.000	0.011	0.058	0.115	

Sample #	Sample Vol.(mL)	Dilution	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	—	0.000	0.000	0.000	0.000119	100.003
ICV 0.05 ppm	↓	—	0.000	0.059	0.059	0.0513	103%
MB	↓	—	0.000	0.000	0.000	0.000119	100.003
LCS 0.04 ppm	↓	—	0.000	0.048	0.048	0.0417	104%
P1103256-1.01	↓	—	0.000	0.001	0.001	0.000979	100.003
-1.01 MS 0.05 ppm	↓	—	0.000	0.058	0.058	0.0504	101% 21% RPD
-1.01 MSD	↓	—	0.00	0.058	0.058	0.0504	101% 5 RPD
-2.01	↓	—	0.001	0.003	0.002	0.00185	100.003
-2.01 VS 0.03 ppm	↓	—	0.001	0.036	0.035	0.0305	102%
-3.01	↓	—	0.000	0.002	0.002	0.00185	100.003
-4.01	↓	—	0.000	0.002	0.002	↓	↓
-5.01	↓	—	0.000	0.000	0.000	0.000119	100.003
CCV/ 0.05 ppm	↓	—	0.000	0.059	0.059	0.0513	103%
CCV/	↓	—	0.000	0.000	0.000	0.000119	100.003
Space not used							

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

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 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 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/26/11 1425  
 Date/Time: 8/26/11 1440  
 Date: 8/26/11

10/16/10  
SA524-10061001 25133 ppb stock for O30.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/16/10  
SA524-10061002 25133 ppb ION/CON for O30.05 ml Pyridine-4-carboxaldehyde TRI  
( IGINC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/16/10  
SA524-10061003 MBTH Sol'n0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284 ; Exp 11/2

EXP: 10/7/10

10/15/10  
SA524-10151001 Cr6+ ION/CON Stock  
Purchased 100ppm Cr6+  
Ricca Chemical Co Cat No 2095-16  
500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA524-10151002 500ppm NO2 StockPurchased  
Ricca Chemical Co Cat No: 5444-5-4

LOT # 1010271

120ml amber glass

524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
2/21/11  
Sol 250ml H<sub>2</sub>SO<sub>4</sub> (END 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

524-0221102 Orbt Coloring Reagent  
2/21/11  
Sol 0.2500g 4,5-diphenylcarbonylhydrazide (END lot 471039  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (END  
LOT # 471540; EXP: 9/24/12).  
EXP: 3/21/11

524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
2/28/11  
Sol 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (END 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

524-0228102 1001 mg/l Orbt  
2/28/11  
Sol Purchased  
Inorganic Ventures CGCR (6)1-1  
125ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

2/28/11

JL

S24-02281103

10ppm Cr6+ Soln

1.0 ml S24-02281102 (1000ppm Cr6+; EXP: 3/1/12) ↑

100ml w/ DI H2O

EXP: 2/28/12

3/7/11

JL

S24-03071101 Cr6+ Colony Reagent

0.2500g 1,5-Diphenylcarbazide

(EMD Lot 47103721; EXP: 1/30/12) ↑ 50 ml w/

Acetone (EMD 47154; EXP: 9/24/12).

EXP: 4/7/11

3/7/11

JL

S24-03071102

500ppm NO2

Purchased

Ricca Chem Co

Cat No 5444.5-4

LOT# 1102544

EXP: 8/20/11

3/17/11

JL

S24-03271101

Alkaline Digestion Soln

20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g

Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L

w/ DI H2O.

EXP: 4/17/11

Reviewed And Approved By:

Initial: JL Date: 3/18/11

4/14/11

JL

S24-04141101

IC02 Eluent

75ml S24-04291002 (10x Conc Eluent; exp 4/29/11)

↑ 750ml w/ DI H2O. DEGAS

EXP: 4/28/11

524-04261102 pH 10.000 Buffer  
4/26/11 Purchased  
SN JT Baker Cat No: 5655-01 (500ml)  
LOT # J33524  
EXP: 9/30/12

4/26/11 524-04261103 NH3 FUMING SOLN  
SN Purchased  
Thermo Orion Orion 951202 (60ml)  
LOT # OX1 P/N: 70263-A04  
EXP: 4/26/12

4/26/11 524-04261103<sup>9/4/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
SN 250 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284, EXP: 11/20/14)  
ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

4/27/11 524-04271101 Amino Sulfuric Soln  
SN 6.25 ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added:  
2.5 ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxalate (Fisher 1363386 13408204; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250 ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
JA  
524-04271102 A/B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1103379  
EXP: 3/20/13

4/28/11  
JA  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
JA  
524-05041101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
JA  
524-05051101 Violet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
JA  
524-05051102 IC02 Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O - Degassed

5/19/11  
JZS24-0591103

ECO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT BAKER  
EM 305041 exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/17/16).  
Add to 1 L volumetric flask containing 500 mL DI water +  
5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring  
up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
JZS24-05201101

PH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT # 1101225

EXP: 12/2012

5/30/11  
JZS24-05201102

PH 4.000 BUFFER

Purchased

JT Baker CAT # 5657-01 500 mL

LOT # J36503

EXP: 9/30/12

5/22/11  
JZS24-05201103

pH 7.38 BUFFER

Purchased

BDH CAT # BDH5058-500 mL

LOT # 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 SA 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564,  
 exp: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D exp: 9/24/12)  
 exp: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 SA

0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

exp: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 SA

0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

exp: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 SA 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426).  
 exp: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
 SA <sup>0.25</sup>  
 0.3 mL Ref 524-015101 @ <sup>5.1</sup>/<sub>10</sub> exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

exp: 9/6/11



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## LABORATORY REPORT

August 31, 2011

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

**RE: JP-GW-3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 29, 2011. For your reference, these analyses have been assigned our service request number P1103282.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 5:16 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JP-GW-3Q11 / 100006114

CAS Project No: P1103282

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 29, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

 Client: Battelle  
 Project ID: JPL-GW-3Q11 / 100006114

Service Request: P1103282

 Date Received: 8/29/2011  
 Time Received: 15:52

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-6	P1103282-001	Water	8/29/2011	09:49	X
DUP-7-3Q11	P1103282-002	Water	8/29/2011	09:55	X
MW-16	P1103282-003	Water	8/29/2011	12:40	X
MW-15	P1103282-004	Water	8/29/2011	14:28	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No. 1111287  
 CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information)		Project Name		Analysis Method and/or Analytes		Preservative Code		Preservative Key	
Battelle 505 Kings Ave Columbus OH 43201 Project Manager: <u>David Lerner</u> Phone: <u>614 726-7311</u> Fax: <u>614 458-6641</u> Email Address for Result Reporting: <u>lerner@battelle.org</u>		<u>TPL-614-3011</u> Project Number: <u>100006114</u> PO # / Billing Information: <u>285 651/Battelle</u> <u>505 Kings Ave</u> <u>Columbus OH 43201</u>		Volatile Organics GC/MS <input type="checkbox"/> 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS <input type="checkbox"/> 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)		<u>Hexavalent Cr 7196</u> <u>0</u>		None HCL HNO3 H2SO4 NaOH Zn Acetate Asc Acid Other	
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Remarks			
<u>MW-6</u>	<u>1</u>	<u>8-29-10</u>	<u>949</u>	<u>AQ</u>	<u>1P</u>	<u>MS/MSD</u>			
<u>DUP-7-3011</u>	<u>2</u>	<u>8-29-11</u>	<u>0955</u>	<u>AQ</u>	<u>1P</u>	<u>MS/MSD</u>			
<u>MW-16</u>	<u>3</u>	<u>8-29-11</u>	<u>1240</u>	<u>AQ</u>	<u>2P</u>	<u>MS/MSD</u>			
<u>MW-15</u>	<u>6</u>	<u>8-29-11</u>	<u>1428</u>	<u>AQ</u>	<u>2P</u>	<u>MS/MSD</u>			

**Report Tier Levels - please select**

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

MRL required Yes / No \_\_\_\_\_  
 MDL / PQL / J required Yes / No \_\_\_\_\_  
 EDD required Yes / No \_\_\_\_\_  
 Type: \_\_\_\_\_

Project Requirements (MRLs, QAPP) \_\_\_\_\_

Requisitioned by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1450  
 Received by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1520

Requisitioned by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1557  
 Received by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1557

Cooler / Blank / Ice / No Ice \_\_\_\_\_  
 Temperature \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103282

**Project:** JPL-GW-3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103282-001.01	7196A	8/29/11	1603	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1622	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103282-002.01	7196A	8/29/11	1603	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1623	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103282-003.01	7196A	8/29/11	1603	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1622	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103282-003.02		8/29/11	1604	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1622	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103282-004.01	7196A	8/29/11	1603	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1623	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103282-004.02		8/29/11	1604	SMO / SSTAPLES	
		8/29/11	1604	P-37 / SSTAPLES	
		8/29/11	1623	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103282

Project: JPL-GW-3Q11 / 100006114

Sample(s) received on: 8/29/11 Date opened: 8/29/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103282-001.01	125mL Plastic NP					
P1103282-002.01	125mL Plastic NP					
P1103282-003.01	125mL Plastic NP					
P1103282-003.02	125mL Plastic NP					
P1103282-004.01	125mL Plastic NP					
P1103282-004.02	125mL Plastic NP					

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

Analytical Report

Client : Battelle  
 Project Name : JPL-GW-3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103282  
 Date Collected : 08/29/11  
 Date Received : 08/29/11

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-6	P1103282-001	0.010	0.003	1	NA	08/29/11 17:20	ND	
DUP-7-3Q11	P1103282-002	0.010	0.003	1	NA	08/29/11 17:20	ND	
MW-16	P1103282-003	0.010	0.003	1	NA	08/29/11 17:20	ND	
MW-15	P1103282-004	0.010	0.003	1	NA	08/29/11 17:20	ND	
Method Blank	P1103282-MB	0.010	0.003	1	NA	08/29/11 17:20	ND	

Approved By Karen Rye Date : 8/30/11



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103283  
**Date Analyzed:** 08/29/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 8/30/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

Service Request: P1103283  
Date Analyzed: 08/29/11

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	0.0500	0.0526	105	90-110
CCV1	0.0500	0.0526	105	90-110
CCV2	0.0500	0.0517	103	90-110

Approved By: Kam Rya Date: 8/30/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL-GW-3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103282  
 Date Collected : NA  
 Date Received : NA  
 Date Extracted : NA  
 Date Analyzed : 08/29/11

Laboratory Control Sample Summary  
 Inorganic Parameters

Sample Name : Laboratory Control Sample  
 Lab Code : P1103282-LCS  
 Test Notes :

Units : mg/L (ppm)  
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By Kanu Ryan Date : 8/30/11

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL-GW-3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103282  
**Date Collected :** 08/29/11  
**Date Received :** 08/29/11  
**Date Extracted :** NA  
**Date Analyzed :** 08/29/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-16 Units : mg/L (ppm)  
 Lab Code : P1103282-003MS P1103282-003DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0425	0.0442	85	88	73-119	4	

Approved By                     *Kanu Rya*                     Date :                     *8/30/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL-GW-3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103282  
 Date Collected : 08/29/11  
 Date Received : 08/29/11  
 Date Extracted : NA  
 Date Analyzed : 08/29/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-15 Units : mg/L (ppm)  
 Lab Code : P1103282-004MS P1103282-004DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0383	0.0383	77	77	73-119	<1	

Approved By Kanu Rya Date : 8/30/11

### pH Run Log

Service Request #(s): P1103282 P1103283

Time: 0830

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/2012	} 98.8%	—
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/2013		—
pH 10 Buffer	524-04261102	9/30/2012		—

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	1.999	20.4°	P1103283-5.01	5	1.905	15.1°
pH 4.000	T	3.991	20.5°	pH 2.000	5	2.030	21.4°
pH 7.000	T	7.003	20.8°				
pH 10.000	T	10.000	20.9°				
Ref#: 524-05201102 T.V= 7.38 EXP: 3/2013		7.388	21.1°				
DI		2.077	21.8°				
pH 2.000	↓	2.002	20.3°				
TIME: 1640							
pH 2 (ML)	5	2.024	21.5°				
P1103282-1.01	T	1.899	13.9°				
T -2.01		1.882	13.7°				
T -3.01		1.846	13.6°				
T -4.01		1.873	13.9°				
P1103283-1.01		1.917	14.4°				
T -2.01		2.099	14.7°				
T -3.01		1.887	14.8°				
T -4.01	↓	1.880	14.8°				

space not used

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> END 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: 8/29/11

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

Analyst: [Signature]  
 Reviewer: [Signature]

Date: 8/29/11  
 Date: 8/30/11

Method EPA 7196A

Service Request#(s): P1103282 P1103283  
 Job#: 524-08291102 T.V.=100ppm Exp: 2/29/12  
 VICCV#: 524-10151001 T.V.=100ppm Exp: 3/30/12

Run#: 259445  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMP 49284 Exp: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 Exp: 9/22/11

Working Curve:

Prep Dilution	N4	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999373
Absorbance @ 540 nm	0.000	0.012	0.061	0.119	

Sample #	Sample Vol.(mL)	Dilution	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	-	✓ 0.000	0.000	0.000	0.000371	20.003
ICV 0.05ppm		-	✓ 0.000	0.063	0.063	0.0526	105%
MB		-	✓ 0.000	0.001	0.001	0.000568	20.003
LCS 0.04ppm		-	✓ 0.000	0.050	0.050	0.0417	104%
P1103282-1.01		-	✓ 0.002	0.004	0.002	0.00141	20.003
-1.01 VS 0.03ppm		-	✓ 0.002	0.033	0.031	0.0257	86%
-2.01		-	✓ 0.002	0.004	0.002	0.00141	20.003
-3.01		-	✓ 0.002	0.005	0.003	0.00225	20.003
-3.01 MS 0.02ppm		-	✓ 0.002	0.053	0.051	0.0425	85% 40%
-3.01 MSD		-	✓ 0.002	0.055	0.053	0.0442	88% RPD
-4.01		-	✓ 0.003	0.004	0.001	0.000568	20.003
-4.01 MS 0.05ppm		-	✓ 0.003	0.049	0.046	0.0383	77%
ICV		-	✓ 0.000	0.063	0.063	0.0526	105%
LCS1		-	✓ 0.000	0.001	0.001	0.000568	
P1103283-4.01 MSD 0.05ppm		-	✓ 0.003	0.049	0.046	0.0383	77% 40% RPD
-1.01		-	✓ 0.006	0.008	0.002	0.00141	20.003
-1.01 MS 0.05ppm		-	✓ 0.006	0.053	0.047	0.0392	78%

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-08291102 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-08291102 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/29/11 @ 1705  
 Date/Time: 8/29/11 @ 1720  
 Date: 8/30/11

Service Request#(s): P1103282 P1103283  
 Stock#: 524-08291102 T.V.=100PPM EXP: 2/29/12  
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/30/12

Run#: 259445  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMA 45284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/23/11

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	0.999969373
Absorbance @ 540 nm	0.000	0.012	0.061	0.119	

Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
P1103283-1.01 MSD	10 ml	—	✓	0.006	0.054	0.048	0.040	800% 20% RPD
-2.01	↓	—	✓	0.005	0.005	0.000	0.00271	10.003
-2.01 VS 0.03PPM	↓	—	✓	0.005	0.040	0.035	0.0291	97%
-3.01	↓	—	✓	0.004	0.006	0.002	0.00141	10.003
-4.01	↓	—	✓	0.004	0.004	0.000	0.000271	10.003
-5.01	↓	—	✓	0.000	0.000	0.000	↓	10.003
CV1 0.05PPM	↓	—	✓	0.000	0.062	0.062	0.0517	103%
CV1	↓	—	✓	0.000	0.000	0.000	0.000271	10.003
space not used								

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-08291102 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-08291102 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/29/11 @ 1705  
 Date/Time: 8/29/11 @ 1730  
 Date: 8/30/11



10/6/10  
SW

524-10061001 25133ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10  
SW

524-10061002 25133ppb ION/CON for O3

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

EXP: 10/20/10

10/6/10  
SW

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SW

524-10151001 Cr6+ ION/CON Stock

Purchased 100ppm Cr6+  
Ricca Chemical Co Cat No 2095-16  
500ml Plastic

LOT # 1010177  
EXP: 3/20/12

10/15/10  
SW

524-10151002 500ppm NO2 Stock

Purchased  
Ricca Chemical Co Cat No: 5444-5-4  
LOT # 1010271 120ml amber glass

2/21/11  
 Jw  
524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11  
 Jw  
524-0221102 Cr6+ Coloring Reagent  
 0.2500g 1,5-diphenylcarbohydrazide (EMD LOT 47103;  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 LOT # 47154D; EXP: 9/24/12).  
 EXP: 3/31/11

2/28/11  
 Jw  
524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11  
 Jw  
524-0228102 1001 mg/l Cr6+  
 Purchased  
 Inorganic Ventures CGCR(6)1-1  
 125ml Clear Glass  
 LOT# D2-CR03040  
 EXP: 3/1/2012

524-04261102 pH 10.000 Buffer  
 4/26/11 Purchased  
 JT Baker Cat No: 5655-01 (500)  
 LOT # J33524  
 EXP: 9/30/12

524-04261103 NH3 FILLING SOLN  
 4/26/11 Purchased  
 Thermo Orion Orion 951202 (60ml)  
 LOT # OX1 P/N: 70263-A04  
 EXP: 4/26/12

524-04261103<sup>9/24/20/11</sup> 1:1 H2SO4  
 4/26/11 250 ml conc H2SO4 (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI H2O  
 LET COOL  
 EXP: 4/26/12

524-04271101 Amido Sulfuric Soln  
 4/27/11 6.25ml conc H2SO4 (LMD 49284; EXP: 11/20/14) Added  
 2.5 ml DI H2O. Let Cool.  
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
 oxalate (Fulka 1363386 B408204; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250ml w/  
 1:1 H2SO4 (524-04261104; EXP: 4/26/12).  
 EXP: 5/25/11

4/27/11  
 Sr  
524-04271102 A&B pH 7.000 Buffer  
 Purchased  
 BDH Cat No: BDH5046-500 mL  
 Lot # 1103379  
 Exp: 3/20/13

4/28/11  
 Sr  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; exp: 11/20/14)  
 ↑ 2L w/ DI H<sub>2</sub>O  
 Exp: 4/28/12

5/4/11  
 Sr  
524-05041101 Alkaline Digestion Soln  
 20.0g NaOH (EMD 47022713; exp: 10/11/12) +  
 30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; exp: 10/11/12)  
 ↑ 1L w/ DI H<sub>2</sub>O  
 Exp: 06/04/11

5/6/11  
 Sr  
524-05051101 Violet Coloring reagent  
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
 exp: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;  
 exp: 9/24/12).  
 Exp: 06/05/11

6/5/11  
 Sr  
524-05051102 I<sub>2</sub> Eluent  
 100 ml 524-04191101 (10x conc eluent; exp: 9/22/11)  
 ↑ 1L w/ DI H<sub>2</sub>O - Degassed

5/19/11  
JZS24-0591103

FCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD <sup>JT BAKER</sup> 305041 exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/17/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
JZS24-05201101

pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/20/11  
JZS24-05201102

pH 4.000 BUFFER

Purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

5/22/11  
JZS24-05201103

pH 7.38 BUFFER

Purchased

BDH CAT# BDH5058-500mL

LOT# 1103361

EX: 3/2013

8/22/11  
 SA 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11  
 SA 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11  
 SA 524-08221106 1000 ppm SO<sub>3</sub> ION/CAN  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11  
 SA 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11  
 SA 524-08231102 2.50ppb Cr<sup>6+</sup> ION/CAN  
<sup>0.25</sup>  
~~0.3~~ mL Ref 524-10151001 @  $\frac{0.1}{10}$  exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
 Ja 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16 DISSOLVED IN 50ml Conc HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 Ja 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10ppm Cr<sup>6+</sup> Std  
 Ja 1.0ml S24-02281102 (1000ppm Cr<sup>6+</sup>; EXP: 3/1/12)  
 ↑ 100ml w/DI H<sub>2</sub>O  
 EXP: 5/28/12

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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 29, 2011. For your reference, these analyses have been assigned our service request number P1103283.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 5:20 pm, Aug 31, 2011

Sue Anderson  
Project Manager



Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103283

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 29, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103283

Date Received: 8/29/2011  
 Time Received: 15:52

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-24-4	P1103283-001	Water	8/29/2011	09:58	X
MW-24-3	P1103283-002	Water	8/29/2011	10:20	X
MW-24-2	P1103283-003	Water	8/29/2011	10:45	X
MW-24-1	P1103283-004	Water	8/29/2011	11:11	X
EB-05-8/29/11	P1103283-005	Water	8/29/2011	10:59	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No: 2110783  
 CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information) <b>BATTILLE</b> 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110				Project Name <b>JPL GW. MON. 3811</b>							
Project Manager <b>DAVID CONVEN</b>				Project Number <b>10206114</b> <del>0186050</del>							
Phone <b>(619) 726-7311</b>		Fax <b>(614) 458-6614</b>		P.O. # / Billing Information <b>285651 / BATTILLE</b> <b>ATTN: GLENN TOMPKINS</b> <b>505 KING AVE.</b> <b>COLUMBUS, OH 43201</b>							
Email Address for Result Reporting <b>SAUCON</b>				Sampler (Print & Sign) <b>SAUCON</b>							
Client Sample ID		Laboratory ID Number		Date Collected		Time Collected		Matrix		Number of Containers	
MW-24-4				8/29/11		0958		W		1	
MW-24-3				8/29/11		1020				1	
MW-24-2				8/29/11		1045				1	
MW-24-1				8/29/11		1111				1	
EB-05-8/29/11				8/29/11		1059		W		1	
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)											
										CR VI (7196)	
Preservative Code											
Preservative Key											
0 None											
1 HCL											
2 HNO3											
3 H2SO4											
4 NaOH											
5 Zn Acetate											
6 Asc Acid											
7 Other											
Remarks											
LEVEL IV QC											
Equipment Blank											

**Report Tier Levels - please select**

Tier I - (Results/Default if not specified) \_\_\_\_\_ Tier III - (Data Validation Package) 10% Surcharge \_\_\_\_\_  
 Tier II - (Results + QC) \_\_\_\_\_ Tier V - (client specified) \_\_\_\_\_ MFL required Yes / No \_\_\_\_\_  
 MDL / POL / J required Yes / No \_\_\_\_\_ EDD required Yes / No \_\_\_\_\_

Relinquished by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1552  
 Relinquished by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1552  
 Relinquished by: (Signature) \_\_\_\_\_ Date: 8/29/11 Time: 1552

Project Requirements (MRLs, QAPP)  
 Cooler / Blank / No Ice \_\_\_\_\_  
 Temperature \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103283

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103283-001.01	7196A	8/29/11	1631	SMO / SSTAPLES	
		8/29/11	1632	P-37 / SSTAPLES	
		8/29/11	1647	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103283-002.01	7196A	8/29/11	1631	SMO / SSTAPLES	
		8/29/11	1632	P-37 / SSTAPLES	
		8/29/11	1647	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103283-003.01	7196A	8/29/11	1631	SMO / SSTAPLES	
		8/29/11	1632	P-37 / SSTAPLES	
		8/29/11	1647	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103283-004.01	7196A	8/29/11	1631	SMO / SSTAPLES	
		8/29/11	1632	P-37 / SSTAPLES	
		8/29/11	1647	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	
P1103283-005.01	7196A	8/29/11	1631	SMO / SSTAPLES	
		8/29/11	1632	P-37 / SSTAPLES	
		8/29/11	1647	In Lab / SANDERSON	
		8/31/11	0851	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103283

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/29/11 Date opened: 8/29/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103283-001.01	125mL Plastic NP					
P1103283-002.01	125mL Plastic NP					
P1103283-003.01	125mL Plastic NP					
P1103283-004.01	125mL Plastic NP					
P1103283-005.01	125mL Plastic NP					

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103283  
Date Collected : 08/29/11  
Date Received : 08/29/11

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-24-4	P1103283-001	0.010	0.003	1	NA	08/29/11 17:20	ND	
MW-24-3	P1103283-002	0.010	0.003	1	NA	08/29/11 17:20	ND	
MW-24-2	P1103283-003	0.010	0.003	1	NA	08/29/11 17:20	ND	
MW-24-1	P1103283-004	0.010	0.003	1	NA	08/29/11 17:20	ND	
EB-05-8/29/11	P1103283-005	0.010	0.003	1	NA	08/29/11 17:20	ND	
Method Blank	P1103283-MB	0.010	0.003	1	NA	08/29/11 17:20	ND	

Approved By Kanu Rya Date : 8/30/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL-GW-3Q11 / 100006114

Service Request: P1103282  
Date Analyzed: 08/29/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Karu Rya Date: 8/30/11  
ICCBMDL120594



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL-GW-3Q11 / 100006114

Service Request: P1103282  
Date Analyzed: 08/29/11

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	0.0500	0.0526	105	90-110
CCV1	0.0500	0.0526	105	90-110
CCV2	0.0500	0.0517	103	90-110

Approved By:

*Kanu Ryan*

Date:

*8/30/11*

CCV1A/120594

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103283  
**Date Collected :** NA  
**Date Received :** NA  
**Date Extracted :** NA  
**Date Analyzed :** 08/29/11

Laboratory Control Sample Summary  
 Inorganic Parameters

**Sample Name :** Laboratory Control Sample  
**Lab Code :** P1103283-LCS  
**Test Notes :**

**Units :** mg/L (ppm)  
**Basis :** NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By                     *Kam Rya*                     Date :                     *8/30/11*

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103283  
**Date Collected :** 08/29/11  
**Date Received :** 08/29/11  
**Date Extracted :** NA  
**Date Analyzed :** 08/29/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-24-4 Units : mg/L (ppm)  
 Lab Code : P1103283-001MS P1103283-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0392	0.0400	78	80	73-119	2	

Approved By                     *Kanu Rya*                     Date :                     *8/30/11*

### pH Run Log

Service Request #(s): P1103282 P1103283

Time: 0830

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/2012	} 98.8%	—
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/2013		—
pH 10 Buffer	524-04261102	9/30/2012		—

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	1.999	20.4°	P1103283-5.01	5	1.905	15.1°
pH 4.000	T	3.991	20.5°	pH 2.000	5	2.030	21.4°
pH 7.000	T	7.003	20.8°				
pH 10.000	T	10.000	20.9°				
Ref#: 524-05201102 T.V= 7.38 EXP: 3/2013		7.388	21.1°				
DI		2.077	21.8°				
pH 2.000	↓	2.002	20.3°				
TIME: 1640							
pH 2 (ML)	5	2.024	21.5°				
P1103282-1.01	T	1.899	13.9°				
T -2.01		1.882	13.7°				
T -3.01		1.846	13.6°				
T -4.01		1.873	13.9°				
P1103283-1.01		1.917	14.4°				
T -2.01		2.099	14.7°				
T -3.01		1.887	14.8°				
T -4.01	↓	1.880	14.8°				

space not used

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> END 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: 8/29/11

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

Analyst: [Signature]  
 Reviewer: [Signature]

Date: 8/29/11  
 Date: 8/30/11

Method EPA 7196A

Service Request#(s): P1103282 P1103283  
 Job#: 524-08291102 T.V.=100ppm Exp: 2/29/12  
 VICCV#: 524-10151001 T.V.=100ppm Exp: 3/30/12

Run#: 259445  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMP 49284 Exp: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 Exp: 9/22/11

Working Curve:

Prep Dilution	N4	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999373
Absorbance @ 540 nm	0.000	0.012	0.061	0.119	

Sample #	Sample Vol.(mL)	Dilution	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	-	✓ 0.000	0.000	0.000	0.000371	20.003
ICV 0.05ppm		-	✓ 0.000	0.063	0.063	0.0526	105%
MB		-	✓ 0.000	0.001	0.001	0.000568	20.003
LCS 0.04ppm		-	✓ 0.000	0.050	0.050	0.0417	104%
P1103282-1.01		-	✓ 0.002	0.004	0.002	0.00141	20.003
-1.01 VS 0.03ppm		-	✓ 0.002	0.033	0.031	0.0257	86%
-2.01		-	✓ 0.002	0.004	0.002	0.00141	20.003
-3.01		-	✓ 0.002	0.005	0.003	0.00225	20.003
-3.01 MS 0.02ppm		-	✓ 0.002	0.053	0.051	0.0425	85% 40%
-3.01 MSD		-	✓ 0.002	0.055	0.053	0.0442	88% RPD
-4.01		-	✓ 0.003	0.004	0.001	0.000568	20.003
-4.01 MS 0.05ppm		-	✓ 0.003	0.049	0.046	0.0383	77%
ICV		-	✓ 0.000	0.063	0.063	0.0526	105%
LCS1		-	✓ 0.000	0.001	0.001	0.000568	
P1103283-4.01 MSD 0.05ppm		-	✓ 0.003	0.049	0.046	0.0383	77% 40% RPD
-1.01		-	✓ 0.006	0.008	0.002	0.00141	20.003
-1.01 MS 0.05ppm		-	✓ 0.006	0.053	0.047	0.0392	78%

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-08291102 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-08291102 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/29/11 @ 1705  
 Date/Time: 8/29/11 @ 1720  
 Date: 8/30/11

Service Request#(s): P1103282 P1103283  
 Stock#: 524-08291102 T.V.=100PPM EXP: 2/29/12  
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/26/12

Run#: 259445  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 45284 EXP: 11/20/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/23/11

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	0.999969373
Absorbance @ 540 nm	0.000	0.012	0.061	0.119	

Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
P1103283-1.01 MSD	10 ml	—	✓	0.006	0.054	0.048	0.040	800% 20% RPD
-2.01	↓	—	✓	0.005	0.005	0.000	0.00271	10.003
-2.01 VS 0.03PPM	↓	—	✓	0.005	0.040	0.035	0.0291	97%
-3.01	↓	—	✓	0.004	0.006	0.002	0.00141	10.003
-4.01	↓	—	✓	0.004	0.004	0.000	-0.000271	10.003
-5.01	↓	—	✓	0.000	0.000	0.000	↓	10.003
CVI 0.05PPM	↓	—	✓	0.000	0.062	0.062	0.0517	103%
CVI	↓	—	✓	0.000	0.000	0.000	-0.000271	10.003
space not used								

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

ICV/CCV spiked with 0.25 ml of 524-10151001 + 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 + 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 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/29/11 @ 1705  
 Date/Time: 8/29/11 @ 1730  
 Date: 8/30/11

10/6/10  
SA524-10061001 25133ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-10061002 25133ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
( IGA INC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-10061003 MBTH Soln0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA524-10151001 Cr6+ Ion/Con Stock  
Purchased 100ppm Cr6+  
Ricca Chemical Co Cat No 2095-16  
500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA524-10151002 500ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cat No: 5444-5-4

LOT # 1010271

120ml amber glass

2/21/11  
 Jw  
524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11  
 Jw  
524-0221102 Cr6+ Coloring Reagent  
 0.2500g 1,5-diphenylcarbohydrazide (EMD LOT 47103;  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 LOT # 47154D; EXP: 9/24/12).  
 EXP: 3/31/11

2/28/11  
 Jw  
524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11  
 Jw  
524-0228102 1001 mg/l Cr6+  
 Purchased  
 Inorganic Ventures CGCR(6)1-1  
 125ml Clear Glass  
 LOT# D2-CR03040  
 EXP: 3/1/2012



524-04261102 pH 10.000 Buffer  
 4/26/11 Purchased  
 SN JT Baker Cat No: 5655-01 (500)  
 LOT # J33524  
 EXP: 9/30/12

4/26/11 524-04261103 NH3 FILLING SOLN  
 SN Purchased  
 Thermo Orion Orion 951202 (60ml)  
 LOT # 0X1 P/N: 70263-A04  
 EXP: 4/26/12

4/26/11 524-04261103<sup>9/24/20/11</sup> 1:1 H2SO4  
 SN 250 ml conc H2SO4 (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI H2O  
 LET COOL  
 EXP: 4/26/12

4/27/11 524-04271101 Amido Sulfuric Soln  
 SN 6.25ml conc H2SO4 (LMD 49284; EXP: 11/20/14) Added  
 2.5 ml DI H2O. Let Cool.  
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
 oxalate (Fulka 1363386 B408204; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250ml w/  
 1:1 H2SO4 (524-04261104; EXP: 4/26/12).  
 EXP: 5/25/11

4/27/11  
 Sr  
524-04271102 A&B pH 7.000 Buffer  
 Purchased  
 BDH Cat No: BDH5646-500 mL  
 Lot # 1163379  
 Exp: 3/20/13

4/28/11  
 Sr  
524-04281101 0.1N H2SO4  
 5.6 ml conc H2SO4 (EMD 49284; exp: 11/20/14)  
 ↑ 2L w/DI H2O  
 Exp: 4/28/12

5/4/11  
 Sr  
524-05041101 Alkaline Digestion Soln  
 20.0g NaOH (EMD 47022713; exp: 10/11/12) +  
 30.0g Na2CO3 (EMD 46321715B; exp: 10/11/12)  
 ↑ 1L w/DI H2O  
 Exp: 06/04/11

5/6/11  
 Sr  
524-05051101 Violet Coloring reagent  
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
 exp: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;  
 exp: 9/24/12).  
 Exp: 06/05/11

6/5/11  
 Sr  
524-05051102 ICO2 Eluent  
 100 ml 524-04191101 (10x conc eluent; exp: 9/22/11)  
 ↑ 1L w/DI H2O - Degassed

5/19/11  
JZS24-0591103

PCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM <sup>JT BAKER</sup> 305041  
exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/17/16).  
Add to 1 L volumetric flask containing 500 mL DI water +  
5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring  
up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
JZS24-05201101

pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/20/11  
JZS24-05201102

pH 4.000 BUFFER

Purchased

JT Baker CAT# 5657-01 500 mL

LOT# J36503

EXP: 9/30/12

5/22/11  
JZS24-05201103

pH 7.38 BUFFER

Purchased

BDH CAT# BDH5058-500 mL

LOT# 1103361

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> ION/CA  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> ION/CA  
<sup>0.25</sup>  
~~0.3~~ mL Ref 524-10151001 @  $\frac{0.1}{10}$  exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
 Ja 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16 DISSOLVED IN 50ml Conc HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 Ja 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10ppm Cr<sup>6+</sup> Std  
 Ja 1.0ml S24-02281102 (1000ppm Cr<sup>6+</sup>; EXP: 3/1/12)  
 ↑ 100ml w/DI H<sub>2</sub>O  
 EXP: 5/28/12

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## LABORATORY REPORT

August 31, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 30, 2011. For your reference, these analyses have been assigned our service request number P1103297.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 5:24 pm, Aug 31, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103297

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 30, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

 Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103297

 Date Received: 8/30/2011  
 Time Received: 14:35

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-4-3	P1103297-001	Water	8/30/2011	08:43	X
MW-4-2	P1103297-002	Water	8/30/2011	09:07	X
MW-4-1	P1103297-003	Water	8/30/2011	09:28	X
MW-3-4	P1103297-004	Water	8/30/2011	10:41	X
MW-3-3	P1103297-005	Water	8/30/2011	11:02	X
MW-3-2	P1103297-006	Water	8/30/2011	11:27	X
EB-06-8/30/11	P1103297-007	Water	8/30/2011	10:55	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

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





**Client:** Battelle

**Service Request:** P1103297

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103297-001.01	7196A	8/30/11	1444	SMO / SSTAPLES	
		8/30/11	1444	P-37 / SSTAPLES	
		8/30/11	1507	In Lab / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-002.01	7196A	8/30/11	1444	SMO / SSTAPLES	
		8/30/11	1444	P-37 / SSTAPLES	
		8/30/11	1507	In Lab / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-003.01	7196A	8/30/11	1444	SMO / SSTAPLES	
		8/30/11	1444	P-37 / SSTAPLES	
		8/30/11	1507	In Lab / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-004.01	7196A	8/30/11	1514	SMO / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-005.01	7196A	8/30/11	1514	SMO / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-006.01	7196A	8/30/11	1514	SMO / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	
P1103297-007.01	7196A	8/30/11	1514	SMO / SANDERSON	
		8/31/11	0852	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103297

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/30/11 Date opened: 8/30/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103297-001.01	125mL Plastic NP					
P1103297-002.01	125mL Plastic NP					
P1103297-003.01	125mL Plastic NP					
P1103297-004.01	125mL Plastic NP					
P1103297-005.01	125mL Plastic NP					
P1103297-006.01	125mL Plastic NP					
P1103297-007.01	125mL Plastic NP					

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

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103297  
 Date Collected : 08/30/11  
 Date Received : 08/30/11

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-4-3	P1103297-001	0.010	0.003	1	NA	08/30/11 16:05	ND	
MW-4-2	P1103297-002	0.010	0.003	1	NA	08/30/11 16:05	ND	
MW-4-1	P1103297-003	0.010	0.003	1	NA	08/30/11 16:05	ND	
MW-3-4	P1103297-004	0.010	0.003	1	NA	08/30/11 16:05	ND	
MW-3-3	P1103297-005	0.010	0.003	1	NA	08/30/11 16:05	ND	
MW-3-2	P1103297-006	0.010	0.003	1	NA	08/30/11 16:05	ND	
EB-06-8/30/11	P1103297-007	0.010	0.003	1	NA	08/30/11 16:05	ND	
Method Blank	P1103297-MB	0.010	0.003	1	NA	08/30/11 16:05	ND	

Approved By                     *Kanu Rya*                     Date :                     *8/31/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103297  
**Date Analyzed:** 08/30/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_\_

*Kanu Rya*

Date: \_\_\_\_\_

*8/31/11*

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103297  
**Date Analyzed:** 08/30/11

**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	0.0500	0.0515	103	90-110
CCV1	0.0500	0.0515	103	90-110
CCV2	0.0500	0.0524	105	90-110

Approved By: Kane Rya Date: 8/31/11  
CCV1A/120594



**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103297  
**Date Collected :** NA  
**Date Received :** NA  
**Date Extracted :** NA  
**Date Analyzed :** 08/30/11

Laboratory Control Sample Summary  
 Inorganic Parameters

**Sample Name :** Laboratory Control Sample  
**Lab Code :** P1103297-LCS  
**Test Notes :**

**Units :** mg/L (ppm)  
**Basis :** NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0421	105	90-110	

Approved By

*Karen Rya*

Date :

*8/31/11*

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103297  
**Date Collected :** 08/30/11  
**Date Received :** 08/30/11  
**Date Extracted :** NA  
**Date Analyzed :** 08/30/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-4-3 Units : mg/L (ppm)  
 Lab Code : P1103297-001MS P1103297-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0396	0.0396	79	79	73-119	<2	

Approved By                     *Kam Rya*                     Date :                     *8/31/11*

# pH Run Log

Service Request #(s): P1103297

Time: 1415

Sample	VWR lot #	Exp.
pH 2 Buffer	<u>524-05201101</u>	<u>12/20/12</u>
pH 4 Buffer	<u>524-05201102</u>	<u>9/30/12</u>
pH 7 Buffer	<u>524-04271102A</u>	<u>3/30/13</u>
pH 10 Buffer	<u>524-04261102</u>	<u>9/30/12</u>

Slope	Prep.Run #
} <u>98.7%</u>	_____
	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	<u>5</u>	<u>1.987</u>	<u>22.7°</u>	<div style="font-size: 4em; opacity: 0.5;">/</div> <p><u>space not used</u></p>			
pH 4.000		<u>3.990</u>	<u>22.7°</u>				
pH 7.000		<u>7.002</u>	<u>22.7°</u>				
pH 10.000		<u>10.005</u>	<u>22.2°</u>				
<u>TIME: 1535</u> Ref#: <u>524-09201103</u>		<u>7.386</u>	<u>23.2°</u>				
DI		<u>2.042</u>	<u>22.1°</u>				
pH 2.000	↓	<u>2.002</u>	<u>22.7°</u>				
pH 2.000	<u>5</u>	<u>1.985</u>	<u>21.5°</u>				
<u>P1103297-1.01</u>		<u>1.850</u>	<u>14.5°</u>				
<u>-2.01</u>		<u>1.738</u>	<u>14.8°</u>				
<u>-3.01</u>		<u>1.709</u>	<u>15.3°</u>				
<u>-4.01</u>		<u>1.940</u>	<u>15.2°</u>				
<u>-5.01</u>		<u>1.934</u>	<u>14.9°</u>				
<u>-6.01</u>		<u>2.069</u>	<u>15.0°</u>				
↓ <u>-7.01</u>		<u>1.957</u>	<u>15.5°</u>				
pH 2.000	↓	<u>1.996</u>	<u>21.0°</u>				

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> AMP 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: 8/29/11

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

Analyst: JV

Date: 8/30/11

Reviewer: KR

Date: 8/31/11

Service Request#(s): P1103297 Run#: 259622  
 Stock#: 524-08291102 T.V.=100PPM EXP: 2/29/12 Prep Run#:  
 CVICCV#: 524-10157001 T.V.=100PPM EXP: 3/30/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD19284 EXP 11/30/14  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999980134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10 ml	-	✓	0.000	0.000	0.000	0.000344	10.003
ICV 0.05PPM		-	✓	0.000	0.060	0.060	0.0515	103%
MB		-	✓	0.000	0.000	0.000	0.000344	10.003
LCS 0.04PPM		-	✓	0.000	0.049	0.049	0.0421	105%
P1103297-1.01		-	✓	0.004	0.005	0.001	0.00120	10.003
-1.01 MS 0.05PPM		-	✓	0.004	0.050	0.046	0.0396	79% 7.1%
-1.01 MSD		-	✓	0.004	0.050	0.046	0.0396	79% 5 RPD
-2.01		-	✓	0.002	0.003	0.001	0.00120	10.003
-2.01 VS 0.03PPM		-	✓	0.002	0.032	0.030	0.0259	86%
-3.01		-	✓	0.002	0.002	0.000	0.000344	10.003
-4.01		-	✓	0.005	0.006	0.001	0.00120	10.003
-5.01		-	✓	0.004	0.005	0.001	0.00120	10.003
CCV1 0.05PPM		-	✓	0.000	0.060	0.060	0.0515	103%
CCB1		-	✓	0.000	0.000	0.000	0.000344	10.003
P1103297-6.01		-	✓	0.006	0.006	0.000		
-7.01		-	✓	0.000	0.000	0.000		
CCV2 0.05PPM		-	✓	0.000	0.061	0.061	0.0524	105%
CCB2		-	✓	0.000	0.000	0.000	0.000344	10.003

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

ICV/CCV spiked with 0.25 ml of 524-1451001 @ 10 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 ↑ 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 ml of sample (T.V. = 0.03 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 8/30/11 @ 1650 1550

Analyzed By: [Signature]

Date/Time: 8/30/11 @ 1605

Reviewed By: [Signature]

Date: 8/31/11

10/6/10  
SW524-10061001 25133 ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061002 25133 ppb ION/CON for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
( IGA INC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW524-10061003 MBTH Sol'n0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SW524-10151001 Cr6+ ION/CON Stock  
Purchased 100 ppm Cr6+  
Ricca Chemical Co Cat No 2095-16  
500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SW524-10151002 500 ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cat No: 5444-5-4  
LOT # 1010271 120ml amber glass

2/21/11  
 JG 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11  
 JG 524-0221102 Orbit Coloring Reagent  
 0.2500g 1,5-diphenylcarbohydrazide (EMD Lot 471031  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 Lot #471540; EXP: 9/30/12).  
 EXP: 3/31/11

2/28/11  
 JG 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11  
 JG 524-0228102 1001 mg/L Orbit  
 Purchased  
 Inorganic Ventures CGCR(6)1-1  
 125ml Clear Glass  
 Lot# D2-CR03040  
 EXP: 3/1/2012

4/26/11  
 SN  
 524-04261102 pH 10.000 Buffer  
 Purchased  
 JT Baker Cat No: 5655-01 (500ml)  
 Lot # J33524  
 EXP: 9/30/12

4/26/11  
 SN  
 524-04261103 NH3 FUMING SOLN  
 Purchased  
 Thermo Orion Orion 951202 (60ml)  
 Lot # 0X1 P/N: 70243-A04  
 EXP: 4/26/12

4/26/11  
 SN  
 524-04261103<sup>9/24/20/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

4/27/11  
 SN  
 524-04271101 Amino Sulfuric Soln  
 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
 2.5ml DI H<sub>2</sub>O. Let Cool.  
 Dissolve 1.6875g N,N-Dimethyl-p-phenylenediamine  
 oxalate (Fluka 136338613408204; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12).  
 EXP: 5/25/11

4/27/11  
SR  
524-04271102 A & B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1163379  
EXP: 3/2013

4/28/11  
SR  
524-04281101 0.1N H2SO4  
5.6 ml conc H2SO4 (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H2O  
EXP: 4/28/12

5/4/11  
SR  
524-05041101 Alkaline Digestion Sol'n  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na2CO3 (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H2O  
EXP: 06/04/11

5/6/11  
SR  
524-05051101 Violet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154 D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
SR  
524-05051102 ICO2 Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L W/DI H2O - Degassed



5/19/11  
Jr

S24-0591103 IC02 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker EM 305641 exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 5/17/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

S24-05201101 pH 2.000 BUFFER

purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/20/11  
Jr

S24-05201102 pH 4.000 BUFFER

purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

9/22/11  
Jr

S24-05201103 pH 7.38 BUFFER

purchased

BDH CAT# BDH5058-500mL

LOT# 1103361

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; J0564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMP:  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAN/CA  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAN/CA  
<sup>0.25</sup>  
~~0.5~~ mL Ref 524-0151001 @  $\frac{0.1}{10}$  exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
 J 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16 DISSOLVED IN 50ml CONC HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/DI H2O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 J 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/DI  
 H2O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H2SO4  
 J 5.6ml CONC H2SO4 (EMD 49984; EXP: 11/20/14)  
 ↑ 2L w/DI H2O  
 EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr6+ STD  
 J 1.0ml S24-02281102 (1000PPM Cr6+; EXP: 3/1/12)  
 ↑ 100ml w/DI H2O  
 EXP: 5/28/12

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## LABORATORY REPORT

September 1, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 31, 2011. For your reference, these analyses have been assigned our service request number P1103317.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 11:05 am, Sep 01, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103317

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 31, 2011 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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

## DETAIL SUMMARY REPORT

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103317

Date Received: 8/31/2011  
 Time Received: 12:00

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-22-3	P1103317-001	Water	8/31/2011	08:53	X
MW-22-2	P1103317-002	Water	8/31/2011	09:16	X
MW-22-1	P1103317-003	Water	8/31/2011	09:41	X
EB-07-08/31/11	P1103317-004	Water	8/31/2011	09:32	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



An Employer - Owned Company

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

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

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: 1105317  
 CAS Contact:

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

Project Name  
 JPL GW MON 3011  
 Project Number: 08808114  
 P.O. # / Billing Information: 285651 / BATTELLE  
 ATTN: GERALD TOMPKINS  
 505 KINGS AVE.  
 COLUMBUS, OH 43201

Project Manager: **DAVID CONNER**  
 Phone: (619) 726-7311 Fax: (614) 458-6614  
 Email Address for Result Reporting: david.conner@batelle.com

Sampler (Print & Sign): [Signature]  
 Date Collected: 8/31/11  
 Time Collected: 0932  
 Matrix: W  
 Number of Containers: 1

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Analysis Method and/or Analytes	Preservative Code	Remarks
MW-22-3		8/31/11	0853	W	1	CR VI (7196)	0	
MW-22-2		8/31/11	0916	W	1			
MW-22-1		8/31/11	0941	W	1			
EB-02-08/31/11		8/31/11	0932	W	1			Compress 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 III - (Data Validation Package) 10% Surcharge \_\_\_\_\_  
 Tier II - (Results + QC) \_\_\_\_\_ Tier V - (client specified) \_\_\_\_\_  
 MFL required Yes / No \_\_\_\_\_ MDL / PQL / J required Yes / No \_\_\_\_\_  
 EDD required Yes / No \_\_\_\_\_ Type: \_\_\_\_\_

Requisitioned by: (Signature) [Signature] Date: 8/31/11 Time: 11:55  
 Received by: (Signature) [Signature] Date: 8/31/11 Time: 12:00  
 Requisitioned by: (Signature) [Signature] Date: 8/31/11 Time: 12:00  
 Received by: (Signature) [Signature] Date: 8/31/11 Time: 12:00

Cooler / Blank Use / No Ice [Signature] Temperature: \_\_\_\_\_ °C



**Client:** Battelle

**Service Request:** P1103317

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103317-001.01	7196A	8/31/11	1215	SMO / SSTAPLES	
		8/31/11	1215	P-37 / SSTAPLES	
		8/31/11	1244	In Lab / SANDERSON	
		8/31/11	1717	P-37 / SANDERSON	
P1103317-002.01	7196A	8/31/11	1215	SMO / SSTAPLES	
		8/31/11	1215	P-37 / SSTAPLES	
		8/31/11	1244	In Lab / SANDERSON	
		8/31/11	1717	P-37 / SANDERSON	
P1103317-003.01	7196A	8/31/11	1215	SMO / SSTAPLES	
		8/31/11	1215	P-37 / SSTAPLES	
		8/31/11	1244	In Lab / SANDERSON	
		8/31/11	1717	P-37 / SANDERSON	
P1103317-004.01	7196A	8/31/11	1215	SMO / SSTAPLES	
		8/31/11	1215	P-37 / SSTAPLES	
		8/31/11	1244	In Lab / SANDERSON	
		8/31/11	1717	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103317

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 8/31/11 Date opened: 8/31/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103317-001.01	125mL Plastic NP					
P1103317-002.01	125mL Plastic NP					
P1103317-003.01	125mL Plastic NP					
P1103317-004.01	125mL Plastic NP					

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103317  
Date Collected : 08/31/11  
Date Received : 08/31/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-22-3	P1103317-001	0.010	0.003	1	NA	08/31/11 13:50	ND	
MW-22-2	P1103317-002	0.010	0.003	1	NA	08/31/11 13:50	ND	
MW-22-1	P1103317-003	0.010	0.003	1	NA	08/31/11 13:50	ND	
EB-07-08/31/11	P1103317-004	0.010	0.003	1	NA	08/31/11 13:50	ND	
Method Blank	P1103317-MB	0.010	0.003	1	NA	08/31/11 13:50	ND	

Approved By Kam Rya Date : 9/1/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103317  
**Date Analyzed:** 08/31/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND

Approved By: Kanu Rya Date: 9/1/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103317  
**Date Analyzed:** 08/31/11

**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	0.0500	0.0533	107	90-110
CCV1	0.0500	0.0533	107	90-110

Approved By:

*Kam Rya*

Date:

*9/1/11*

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103317  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 08/31/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103317-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

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	90-110	

Approved By Karen Rya Date : 9/1/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103317  
 Date Collected : 08/31/11  
 Date Received : 08/31/11  
 Date Extracted : NA  
 Date Analyzed : 08/31/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-22-3 Units : mg/L (ppm)  
 Lab Code : P1103317-001MS P1103317-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0393	0.0402	79	80	73-119	2	

Approved By Kam Rya Date : 9/1/11

### pH Run Log

Service Request #(s): P1103317

Time: 07:25

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-05201101	12/2012	} 97.7% 8/31/11	—
pH 4 Buffer	524-05201102	9/30/12		Run#
pH 7 Buffer	524-04271102A	3/2013		—
pH 10 Buffer	524-04261102	9/30/12		—

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	2.000	21.5°				
pH 4.000	T	4.000	21.8°				
pH 7.000	T	7.011	21.9°				
pH 10.000	T	10.000	22.2°				
524-05201103 Exp: 3/2013 Ref#: T.V=7.80		7.394	22.3°				
DI		1.902	22.3°				
pH 2.000		1.997	21.3°				
TIME: 1315							
pH 2.000	5	2.021	22.5°				
P1103317-1.01		2.089	17.5°				
T -2.01		1.861	17.3°				
T -3.01		1.890	17.2°				
✓ -4.01		2.039	17.2°				
pH 2.000		2.022	22.3°				

Space not used

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMD 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: 8/29/11

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

Analyst: [Signature]

Date: 8/31/11

Reviewer: [Signature]

Date: 8/31/11



Service Request#(s): P1107317  
 Stock#: 524-08291102 TV=10PPM EXP: 2/28/12  
 CV/CCV#: 524-10151001 TV=100PPM EXP: 3/20/12

Run#: 259794  
 Prep Run#: \_\_\_\_\_  
 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/10  
 Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999935833
Absorbance @ 540 nm	0.000	0.011	0.058	0.114	

Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	—	✓	0.000	0.000	0.000	-0.00000705	10.003
ICV 0.05PPM	↓	—	✓	0.000	0.061	0.061	0.0533	107%
MB	↓	—	✓	0.000	0.000	0.000	-0.00000705	10.003
LCS 0.04PPM	↓	—	✓	0.000	0.046	0.046	0.0402	101%
A103317-1.01	↓	—	✓	0.000	0.070	0.000	-0.00000705	10.003
8/31/11 1.01 MSD	↓	—	✓	0.000	0.045	0.045	0.0393	79% 2% PRC
-1.01 MSD	↓	—	✓	0.000	0.046	0.046	0.0402	80% 5% PRC
-2.01	↓	—	✓	0.000	0.002	0.002	0.00174	10.003
-2.01 VS 0.02PPM	↓	—	✓	0.000	0.030	0.030	0.0262	87%
-3.01	↓	—	✓	0.001	0.003	0.002	0.00174	10.003
✓ -4.01	↓	—	✓	0.000	0.000	0.000	-0.00000705	10.003
CVI 0.05PPM	↓	—	✓	0.000	0.061	0.061	0.0533	107%
CCB1	↓	—	✓	0.000	0.000	0.000	-0.00000705	10.003
space not used								

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

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-08291102 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-08291102 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 8/31/11 @ 1335  
 Date/Time: 8/31/11 @ 1350  
 Date: 8/31/11

10/6/10  
SA524-1006100125133 ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-1006100225133 ppb ION/COV for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
(IGINC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-10061003

MBTH Soln

0.5000 g MBTH (Aldrich 54646EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA524-10151001Cr<sup>6+</sup> ION/COV Stock  
100 ppm Cr<sup>6+</sup>Purchased  
Ricca Chemical Co Cut No 2095-16  
500 ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA524-10151002500 ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cut No: 5444-5-4

LOT # 1010271

120 ml amber glass

2/21/11  
 Jv 524-02211101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11  
 Jv 524-02211102 Orbt Coloring Reagent  
 0.2500g 1,5-diphenylcarbonylhydrazide (EMD Lot 47103i  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 Lot #47154D; EXP: 9/24/12).  
 EXP: 3/21/11

2/28/11  
 Jv 524-02281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11  
 Jv 524-02281102 1001 mg/L Orbt  
 Purchased  
 Inorganic Ventures CGCR (6)1-1  
 125 mL Clear Glass  
 Lot# D2-CR03040  
 EXP: 3/1/2012

524-04261102 pH 10.000 Buffer  
 4/26/11 Purchased  
 JT Baker Cat No: 5655-01 (500m)  
 Lot # J33524  
 EXP: 9/30/12

4/26/11 524-04261103 NH3 FILLING SOLN  
 Purchased  
 Thermo Orion Orion 951202 (60m)  
 Lot # OX1 P/N: 70263-A04  
 EXP: 4/26/12

4/26/11 524-0426110~~34~~<sup>34</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250 ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

4/27/11 524-04271101 Amine Sulfuric Soln  
 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (LMD 49284; EXP: 11/20/14) Added  
 2.5ml DI H<sub>2</sub>O. Let Cool.  
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
 Oxidant (Fluka 1363386 B408209; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
 EXP: 5/25/11

4/27/11  
 SR  
524-04271102 A&B pH 7.000 Buffer  
 Purchased  
 BDH Cat No: BDH5046-500mL  
 LOT # 1163379  
 EXP: 3/20/13

4/28/11  
 SR  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L W/DI H<sub>2</sub>O  
 EXP: 4/28/12

5/4/11  
 SR  
524-05041101 Alkaline Digestion Sol'n  
 20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
 30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
 ↑ 1L W/DI H<sub>2</sub>O  
 EXP: 06/04/11

5/6/11  
 SR  
524-05051101 Violet Coloring reagent  
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
 EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;  
 EXP: 9/24/12).  
 EXP: 06/05/11

6/5/11  
 SR  
524-05051102 ICO<sub>2</sub> Eluent  
 100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
 ↑ 1L W/DI H<sub>2</sub>O. Degassed

5/19/11  
Jr

524-05191103      PCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT BAKER <sup>EM 305641</sup> AD806 exp: 5/13/16) in 100 mL Methanol (B&J AD806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

524-05201101      pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT # 1101225

EXP: 12/2012

5/20/11  
Jr

524-05201102      pH 4.000 BUFFER

Purchased

JT Baker CAT # 5657-01      500mL

LOT # J36503

EXP: 9/30/12

5/22/11  
Jr

524-05201103      pH 7.38 BUFFER

Purchased

BDH CAT # BDH5058-500mL

LOT # 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 52564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD:  
 Lot 47154D EXP: 9/24/12)  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> ION/CAN  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> ION/CAN  
<sup>0.25</sup>  
~~0.5~~ mL Ref 524-0151001 @ <sup>0.1</sup>/<sub>10</sub> exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
 Ja 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16 DISSOLVED IN 50ml Conc HCl  
 (EMD 49260 EXP: 2/7/16) ↑ 500ml w/DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587, EXP: 10/19/14) ↑ 250ml w/DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 Ja 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr<sup>6+</sup> Std  
 Ja 1.0ml S24-02281102 (1000PPM Cr<sup>6+</sup>; EXP: 3/1/12)  
 ↑ 100ml w/DI H<sub>2</sub>O  
 EXP: 3/28/12



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## LABORATORY REPORT

September 2, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on September 1, 2011. For your reference, these analyses have been assigned our service request number P1103365.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 12:27 pm, Sep 02, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103365

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## CASE NARRATIVE

The samples were received intact under chain of custody on September 1, 2011 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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103365

Date Received: 9/1/2011  
 Time Received: 13:21

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-21-5	P1103365-001	Water	9/1/2011	09:11	X
MW-21-4	P1103365-002	Water	9/1/2011	09:33	X
MW-21-3	P1103365-003	Water	9/1/2011	09:54	X
MW-21-2	P1103365-004	Water	9/1/2011	10:31	X
MW-21-1	P1103365-005	Water	9/1/2011	10:58	X
EB-08-09/01/11	P1103365-006	Water	9/1/2011	10:49	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No. 1105365  
 CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information)				Project Name		Analysis Method and/or Analytes										Preservative Key			
<b>BATELLE</b> 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110 Project Manager: <b>DAVID CONNER</b> Phone: (619) 726-7311 Fax: (619) 458-6614 Email Address for Result Reporting: _____ Project Number: <u>10006114</u> P.O. # / Billing Information: <u>285051 / BATELLE</u> ARTN: <u>GERARD Tompkins</u> <u>SOS KING AVE.</u> <u>COLUMBUS, OH 43201</u>				JPL.GW.MON.3011 <del>10006114</del>		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)										Preservative Code 0 (7196)		Preservative Key 0 None 1 HCL 2 HNO3 3 H2SO4 4 NaOH 5 Zn Acetate 6 Asc Acid 7 Other	
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers											Remarks			
MW-21-5	1	9/1/11	0911	W	1											Level IV QC			
MW-21-4	2	9/1/11	0933		1														
MW-21-3	7	9/1/11	0954		1											M/S /MSD			
MW-21-2	4	9/1/11	1031		2											Level IV QC			
MW-21-1	5	9/1/11	1058	W	1														
SB-08-09/01/11	6	9/1/11	1049	W	1											Sample is blank			

**Report Tier Levels - please select**

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

MRL required Yes / No \_\_\_\_\_  
 MDL / PQL / J required Yes / No \_\_\_\_\_  
 EDD required Yes / No \_\_\_\_\_  
 Type: \_\_\_\_\_

Project Requirements (MRLs, GAPP) \_\_\_\_\_

Refrigerated by (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Refrigerated by (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Refrigerated by (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Refrigerated by (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Cooler / Blank / No Ice \_\_\_\_\_  
 Temperature \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103365

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103365-001.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-002.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-003.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-004.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-004.02		9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-005.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	
P1103365-006.01	7196A	9/1/11	1329	SMO / SSTAPLES	
		9/1/11	1329	P-37 / SSTAPLES	
		9/1/11	1354	In Lab / SANDERSON	
		9/1/11	1543	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103365

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 9/1/11 Date opened: 9/1/11 by: SSTAPLES

**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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103365-001.01	125mL Plastic NP					
P1103365-002.01	125mL Plastic NP					
P1103365-003.01	125mL Plastic NP					
P1103365-004.01	125mL Plastic NP					
P1103365-004.02	125mL Plastic NP					
P1103365-005.01	125mL Plastic NP					
P1103365-006.01	125mL Plastic NP					

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

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103365  
**Date Collected :** 09/01/11  
**Date Received :** 09/01/11

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-21-5	P1103365-001	0.010	0.003	1	NA	09/01/11 14:45	ND	
MW-21-4	P1103365-002	0.010	0.003	1	NA	09/01/11 14:45	ND	
MW-21-3	P1103365-003	0.010	0.003	1	NA	09/01/11 14:45	ND	
MW-21-2	P1103365-004	0.010	0.003	1	NA	09/01/11 14:45	ND	
MW-21-1	P1103365-005	0.010	0.003	1	NA	09/01/11 14:45	ND	
EB-08-09/01/11	P1103365-006	0.010	0.003	1	NA	09/01/11 14:45	ND	
Method Blank	P1103365-MB	0.010	0.003	1	NA	09/01/11 14:45	ND	

Approved By                     *Kam Rya*                     Date :                     *9/2/11*



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

Service Request: P1103365  
Date Analyzed: 09/01/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 9/2/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103365  
**Date Analyzed:** 09/01/11

**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	0.0500	0.0524	105	90-110
CCV1	0.0500	0.0515	103	90-110
CCV2	0.0500	0.0515	103	90-110

Approved By: Kanu Rya Date: 9/2/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103365  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 09/01/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103365-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0421	105	90-110	

Approved By Kanu Rya Date : 9/2/11

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103365  
**Date Collected :** 09/01/11  
**Date Received :** 09/01/11  
**Date Extracted :** NA  
**Date Analyzed :** 09/01/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-21-2 Units : mg/L (ppm)  
 Lab Code : P1103365-004MS P1103365-004DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0404	0.0404	81	81	73-119	<1	

Approved By                     *Kam Rya*                     Date :                     *9/2/11*

# pH Run Log

Service Request #(s): P1103365

Time: 0726

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 96.9%	_____
	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	Sample	#	pH	Temp. °C
pH 2.000	5	2.002	21.6°	<div style="font-size: 4em; font-weight: bold;">/</div> <p>space not used</p>			
pH 4.000		4.017	21.9°				
pH 7.000		7.013	22.0°				
pH 10.000		9.998	22.2°				
DI		1.987	20.6°				
Ref#: 524-05201103		7.418	22.2°				
DI		1.987	20.6°				
pH 2.000	↓	2.005	21.6°				
TIME: 1414							
pH 2.000	5	2.026	22.8°				
P1103365-1.01		1.919	13.6°				
-2.01		1.879	13.0°				
-3.01		2.014	13.3°				
-4.01		2.034	13.6°				
-5.01		1.987	13.7°				
-6.01		1.893	14.4°				
pH 2.000	↓	2.030	22.4°				

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMO 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: 8/29/11

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

Analyst: [Signature]

Date: 9/1/11

Reviewer: [Signature]

Date: 9/1/11

Hexavalent Chromium (Liquids)

Service Request#(s): P1103365 Run#: 260027

Stock#: 524-08291102 T.V. = 10 PPM EXP. 2/29/12 Prep Run#:

CVICCV#: 594-10151001 T.V. = 100 PPM EXP. 3/30/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/30/14

Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.99998434
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10 ml	-	✓	0.000	0.000	0.000	0.000344	10.003
ICV 0.05 PPM	↓	-	✓	0.000	0.061	0.061	0.0524	105%
MB	↓	-	✓	0.000	0.000	0.000	0.000344	10.003
LCS 0.04 PPM	↓	-	✓	0.000	0.049	0.049	0.0421	105%
P1103365-1.01	↓	-	✓	0.003	0.005	0.002	0.00205	10.003
-1.01 VS 0.03 PPM	↓	-	✓	0.003	0.034	0.031	0.0268	89%
-2.01	↓	-	✓	0.006	0.006	0.000	0.000344	10.003
-3.01	↓	-	✓	0.000	0.000	0.000	0.000344	↓
-4.01	↓	-	✓	0.004	0.004	0.000	0.000344	↓
-4.01 MS <sup>0.05 PPM</sup>	↓	-	✓	0.004	0.051	0.047	0.0404	81% 2.1%
-4.01 MSD	↓	-	✓	0.004	0.051	0.047	0.0404	81% 5 RPD
↓ -5.01	↓	-	✓	0.008	0.008	0.000	0.000344	10.003
CCV1 0.05 PPM	↓	-	✓	0.000	0.060	0.060	0.0515	103%
CCB1	↓	-	✓	0.000	0.000	0.000	0.000344	10.003
P1103365-6.01	↓	-	✓	0.000	0.000	0.000	0.000344	10.003
CCV2 0.05 PPM	↓	-	✓	0.000	0.060	0.060	0.0515	103%
CCB2	↓	-	✓	0.000	0.000	0.000	0.000344	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 ↑ 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 ↑ 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 ml of sample (T.V. = 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 9/1/11 @ 13:14:30  
 Date/Time: 9/16/11 @ 14:45  
 Date: 9/1/11

10/16/10  
SA

524-10061001 25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
(10146598 ;Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10  
SA

524-10061002 25133 ppb ION/CON for O3

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

EXP: 10/20/10

10/6/10  
SA

524-10061003 MBTH Soln

0.5000 g MBTH (Aldrich 54696EK ;Exp: 8/7/14 ) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA

524-10151001 Cr6+ ION/CON Stock

Purchased 100ppm Cr6+  
Ricca Chemical Co Cat No 2095-16

500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA

524-10151002 500ppm NO2 Stock

Purchased Ricca Chemical Co Cat No: 5444-54

LOT # 1010271

120ml amber glass

524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
2/21/11  
JW 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/11)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

524-0221102 Orbt Coloring Reagent  
2/21/11  
JW 0.2500g 1,5-diphenylcarbohydrazide (EMD lot 47103;  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
LOT # 47154D; EXP: 9/24/12).  
EXP: 3/31/11

524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
2/28/11  
JW 5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

524-0228102 1001 mg/l Orbt  
2/28/11  
JW purchased  
Inorganic Ventures CGCR(6)1-1  
125ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012



524-04261102 pH 10.000 Buffer  
 4/26/11 Purchased  
 JT Baker Cat No: 5655-01 (500ml)  
 LOT # J33524  
 EXP: 9/30/12

524-04261103 NH3 FILLING SOLN  
 4/26/11 Purchased  
 Thermo Orion Orion 951202 (60ml)  
 LOT # OX1 P/N: 70263-A04  
 EXP: 4/26/12

524-04261103H 1:1 H<sub>2</sub>SO<sub>4</sub>  
 4/26/11  
 250 ml CONC H<sub>2</sub>SO<sub>4</sub> (CMD 49284, EXP: 11/20/14)  
 ADDED SLOWLY TO 250 ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

524-04271101 Amino Sulfuric Soln  
 4/27/11  
 6.25 ml CONC H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added.  
 2.5 ml DI H<sub>2</sub>O. Let COOL.  
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamin  
 Oxalate (Fluka 1363386 13408204; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250 ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
 EXP: 5/25/11

4/27/11  
SR  
524-04271102 A & B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1103379  
EXP: 3/20/13

4/28/11  
SR  
524-04281101 0.1N H2SO4  
5.6 ml conc H2SO4 (EMD 49284; EXP: 11/20/14)  
↑ 2L w/ DI H2O  
EXP: 4/28/12

5/4/11  
SR  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na2CO3 (EMD 46321715B; EXP: 10/11/12)  
↑ 1L w/ DI H2O  
EXP: 06/04/11

5/6/11  
SR  
524-05051101 Crat Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
SR  
524-05051102 ICO2 Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L w/ DI H2O - Degassed

5/19/11  
Jr

S24-0591103 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker <sup>JT Baker</sup> ~~EM~~ 305641 exp: 6/15/15) in 100 mL Methanol (B&J A0806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

S24-05201101 pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT # 1101225

EXP: 12/2012

5/20/11  
Jr

S24-05201102 pH 4.000 BUFFER

Purchased

JT Baker CAT # 5657-01 500 mL

LOT # J36503

EXP: 9/30/12

5/22/11  
Jr

S24-05201103 pH 7.38 BUFFER

Purchased

BDH CAT # BDH5058-500 mL

LOT # 1103301

EX: 3/2013

8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 SA 0.25g 1,5-diphenylcarbohydrazide (JT Baker; J0564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D EXP: 9/24/12  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 SA  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> IAW/CA  
 SA  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Mallinckrodt Lot #H25469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> stock  
 SA 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> IAW/CA  
 SA  
<sup>0.25</sup>  
~~0.5~~ mL Ref 524-10151001 @ <sup>0.1</sup>/<sub>10</sub> exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
 Ja 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16 DISSOLVED IN 50ml Conc HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 Ja 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr6+ Std  
 Ja 1.0ml S24-02281102 (1000PPM Cr6+; EXP: 3/1/12)  
 ↑ 100ml w/DI H<sub>2</sub>O  
 EXP: 3/28/12

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## LABORATORY REPORT

September 9, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on September 2, 2011. For your reference, these analyses have been assigned our service request number P1103380.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 7:49 am, Sep 09, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103380

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## CASE NARRATIVE

The samples were received intact under chain of custody on September 2, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103380

Date Received: 9/2/2011  
 Time Received: 12:25

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-20-5	P1103380-001	Water	9/2/2011	08:46	X
MW-20-4	P1103380-002	Water	9/2/2011	09:20	X
MW-20-3	P1103380-003	Water	9/2/2011	09:47	X
MW-20-2	P1103380-004	Water	9/2/2011	10:12	X
MW-20-1	P1103380-005	Water	9/2/2011	10:33	X
DUPE-04-3Q11	P1103380-006	Water	9/2/2011	00:00	X
EB-09-09/02/11	P1103380-007	Water	9/2/2011	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No: 1105380  
 CAS Contact: \_\_\_\_\_

Company Name & Address (Reporting Information)		Project Name		Analysis Method and/or Analytes		Preservative Code		Preservative Key	
<b>BARTER</b> 2940 OLD TOWN AVE. 6-208- SAN DIEGO, CA 92110		JPL. GU. NOV. 3&11 Project Number: <u>0806114</u> <del>0806114</del>		PO # / Billing Information 285651 / BARTER ATTN: GERALD THOMPkins 505 KING AVE. COLUMBUS, OH 43201		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/>		0	
Project Manager: <u>DAVID COURER</u>		Phone: _____ Fax: _____ (619) 726-7311 (614) 458-1664		Sampler (Print & Sign) CHASE BARTON		TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted)		Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	
Email Address for Result Reporting: _____		Laboratory ID Number: _____		Date Collected: _____		Time Collected: _____		Matrix: _____	
Client Sample ID: _____		Laboratory ID Number: _____		Date Collected: _____		Time Collected: _____		Matrix: _____	
MW -20 -5		1		9/2/11 0846		W		1	
MW -20 -4		2		9/2/11 0920		W		1	
MW -20 -3		3		9/2/11 0942		W		1	
MW -20 -2		4		9/2/11 1012		W		1	
MW -20 -1		5		9/2/11 1033		W		1	
<del>Dupe - 1/11</del>		<del>1</del>		<del>1/11</del>		<del>W</del>		<del>1</del>	
<del>Dupe - 04-30-11</del>		<del>6</del>		<del>9/2/11</del>		<del>W</del>		<del>1</del>	
<del>CB-09-09/02/11</del>		<del>7</del>		<del>9/2/11</del>		<del>W</del>		<del>1</del>	

**Report Tier Levels - please select**

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

Reinquired by: (Signature) \_\_\_\_\_ Date: 09/02/11 Time: \_\_\_\_\_  
 Reinquished by: (Signature) \_\_\_\_\_ Date: 09/02/11 Time: \_\_\_\_\_

Received by: (Signature) \_\_\_\_\_ Date: 09/14/11 Time: 11:45  
 Received by: (Signature) \_\_\_\_\_ Date: 09/14/11 Time: 11:25

Project Requirements (MRLs, QAPP)  
 Cooler Blank / No Ice \_\_\_\_\_  
 Temperature: \_\_\_\_\_ °C

**Client:** Battelle

**Service Request:** P1103380

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103380-001.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-002.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-003.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-004.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-005.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-006.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
P1103380-007.01	7196A	9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11	1334	In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103380

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 9/2/11 Date opened: 9/2/11 by: SSTAPLES

*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 <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: ° C    Blank Temperature: 2° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>  |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103380-001.01	125mL Plastic NP					
P1103380-002.01	125mL Plastic NP					
P1103380-003.01	125mL Plastic NP					
P1103380-004.01	125mL Plastic NP					
P1103380-005.01	125mL Plastic NP					
P1103380-006.01	125mL Plastic NP					
P1103380-007.01	125mL Plastic NP					

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

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103380  
 Date Collected : 09/02/11  
 Date Received : 09/02/11

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-20-5	P1103380-001	0.010	0.003	1	NA	09/02/11 15:15	ND	
MW-20-4	P1103380-002	0.010	0.003	1	NA	09/02/11 15:15	ND	
MW-20-3	P1103380-003	0.010	0.003	1	NA	09/02/11 15:15	ND	
MW-20-2	P1103380-004	0.010	0.003	1	NA	09/02/11 15:15	ND	
MW-20-1	P1103380-005	0.010	0.003	1	NA	09/02/11 15:15	ND	
DUPE-04-3Q11	P1103380-006	0.010	0.003	1	NA	09/02/11 15:15	ND	
EB-09-09/02/11	P1103380-007	0.010	0.003	1	NA	09/02/11 15:15	ND	
Method Blank	P1103380-MB	0.010	0.003	1	NA	09/02/11 15:15	ND	

Approved By                     *Kam Rya*                     Date :                     *9/6/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103380  
**Date Analyzed:** 09/02/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 9/6/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103380  
**Date Analyzed:** 09/02/11

**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	0.0500	0.0507	101	90-110
CCV1	0.0500	0.0507	101	90-110
CCV2	0.0500	0.0507	101	90-110

Approved By: Kanu Rya Date: 9/6/11  
CCVIA/120594

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103380  
**Date Collected :** NA  
**Date Received :** NA  
**Date Extracted :** NA  
**Date Analyzed :** 09/02/11

Laboratory Control Sample Summary  
 Inorganic Parameters

**Sample Name :** Laboratory Control Sample  
**Lab Code :** P1103380-LCS  
**Test Notes :**

**Units :** mg/L (ppm)  
**Basis :** NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0396	99	90-110	

Approved By                     *Karen Ryan*                    

Date :                     *9/6/11*



**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103380  
**Date Collected :** 09/02/11  
**Date Received :** 09/02/11  
**Date Extracted :** NA  
**Date Analyzed :** 09/02/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-20-5 Units : mg/L (ppm)  
 Lab Code : P1103380-001MS P1103380-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0379	0.0387	76	77	73-119	2	

Approved By

*Kam Rya*

Date :

*9/10/11*

### pH Run Log

Service Request #(s): P1103380

Time: 0725

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-05201102	9/30/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 96.9%	—
	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	Sample	#	pH	Temp. °C
pH 2.000	5	2.002	22.1°	space not used /			
pH 4.000		3.987	22.4°				
pH 7.000		6.983	22.5°				
pH 10.000		9.997	22.7°				
Ref#: 524-05201103		7.392	22.8°				
DI		1.869	21.5°				
pH 2.000		1.982	22.1°				
TIME: 1430							
pH 2.000	5	2.024	23.4°				
P1103380-1.01		1.802	19.2°				
-2.01		1.890	18.6°				
-3.01		1.817	18.7°				
-4.01		2.177	19.4°				
-5.01		1.773	19.7°				
-6.01		1.907	19.6°				
-7.01		1.912	20.1°				
pH 2.000		2.022	23.2°				

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMD 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: 8/29/11

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

Analyst: JR

Date: 9/2/11

Reviewer: KR

Date: 9/16/11

Method EPA 7196A

Service Request#(s):

P1103380

Run#:

260231

Stock#: 524-08291102 T.V.=10PPM EXP: 2/29/12

Prep Run#:

CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMS 49284 EXP: 3/20/12

Coloring Reagent Ref#: 524-08221104 EXP: 9/22/11

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	0.999780134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	-	✓	0.000	0.000	0.000	0.006344	10.003
ICV 0.05PPM		-	✓	0.000	0.059	0.059	0.0507	101%
MB		-	✓	0.000	0.001	0.001	0.00120	10.003
LCS 0.04PPM		-	✓	0.000	0.046	0.046	0.0396	99%
P1103380-1.01		-	✓	0.000	0.001	0.001	0.00120	10.003
-1.01 MS 0.05PPM		-	✓	0.000	0.044	0.044	0.0379	76% 2.2%
-1.01 MSD J		-	✓	0.000	0.045	0.045	0.0387	77% 5.4%
-2.01		-	✓	0.000	0.000	0.000	0.000344	10.003
-2.01 VS 0.03PPM		-	✓	0.000	0.030	0.030	0.0259	86%
-3.01		-	✓	0.002	0.003	0.001	0.00120	10.003
-4.01		-	✓	0.000	0.000	0.000	0.000344	J
✓ -5.01		-	✓	0.000	0.000	0.000	0.000344	J
ICV 0.05PPM		-	✓	0.000	0.059	0.059	0.0507	101%
ICB		-	✓	0.000	0.000	0.000	0.000344	10.003
P1103380-6.01		-	✓	0.000	0.000	0.000	J	J
J -7.01		-	✓	0.000	0.000	0.000	J	J
ICV 0.05PPM		-	✓	0.000	0.059	0.059	0.0507	101%
ICB		-	✓	0.000	0.000	0.000	0.000344	10.003

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

ICV/CCV spiked with 0.25 ml of 524-10151001 (Cat) ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 ↑ 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 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By:

Date/Time: 9/2/11 @ 1500

Analyzed By:

Date/Time: 9/2/11 @ 1515

Reviewed By:

Date: 9/4/11

10/16/10  
SA524-10061001 25133 ppb stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10140598 ; Exp: 8/11/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/16/10  
SA524-10061002 25133 ppb stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TEI  
( ICI INC ; Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/16/10  
SA524-10061003 MBTH 50/170.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 49284; EXP 11/2

EXP: 10/7/10

10/15/10  
SA524-10151001 Cr<sup>6+</sup> ION/CON Stock  
Purchased 100 ppm Cr<sup>6+</sup>  
Ricca Chemical Co Cat No 2095-16  
500 ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA524-10151002 500 ppm NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cat No: 5444.5-4

LOT # 1010271

120 ml amber glass

04  
2/21/11 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
Sol 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

2/21/11 524-0221102 Carb Coloring Reagent  
Sol 0.2500g 4,5-diphenylcarbonylhydrazide (EMD Lot 47103;  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
LOT # 47154D; EXP: 9/24/12).  
EXP: 3/21/11

2/28/11 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
Sol 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

2/28/11 524-0228102 1001<sup>mg</sup>/L Carb  
Sol Purchased  
Inorganic Ventures CGCR(6)1-1  
125ml Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

524-04261102 pH 10.000 Buffer  
4/26/11 Purchased  
SN JT Baker Cat No: 5655-01 (500ml)  
LOT # J33524  
EXP: 9/30/12

524-04261103 NH3 Fuming Soln  
4/26/11 Purchased  
SN Thermo Orion Orion 951202 (60ml)  
LOT # 0X1 P/N: 70243-A04  
EXP: 4/26/12

524-04261103<sup>9/26/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
4/26/11 SN 250ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284, EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

524-04271101 Amino Sulfuric Soln  
4/27/11 SN 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added  
2.5ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamin  
oxalate (Fisher 136338613408204; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
Sr  
524-04271102 A&B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1103379  
EXP: 3/30/13

4/28/11  
Sr  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
Sr  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L W/DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
Sr  
524-05051101 Ortol Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

5/5/11  
Sr  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L W/DI H<sub>2</sub>O - Degassed

5/19/11  
Jr

S24-05191103

IC02 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT BAKER  
exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 5/13/16)  
Add to 1 L volumetric flask containing 500 mL DI water +  
5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring  
up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

S24-05201101

pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/30/11  
Jr

S24-05201102

pH 4.000 BUFFER

Purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

5/22/11  
Jr

S24-05201103

pH 7.38 BUFFER

Purchased

BDH CAT# BDH5058-500mL

LOT# 1103361

EX: 3/2013



8/22/11 524-08221104 Cr<sup>6+</sup> Coloring Reagent  
 0.25g 1,5-diphenylcarbohydrazide (JT Baker; 50564  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD)  
 Lot 47154D EXP: 9/24/12  
 EXP: 9/22/11

8/22/11 524-08221105 1000ppm SO<sub>3</sub> stock  
 0.1591 Na<sub>2</sub>SO<sub>3</sub> (JT Baker Lot #H10627; Exp: 8/31/14) up to  
 100 ml w/ DI Water.

EXP: 9/5/11

8/22/11 524-08221106 1000 ppm SO<sub>3</sub> ICA/CA  
 0.1607 Na<sub>2</sub>SO<sub>3</sub> (Maclinckrodt Lot #H125469; Exp: 8/11/14) up  
 to 100 ml w/ DI Water.

EXP: 9/5/11

8/23/11 524-08231101 1000ppb Cr<sup>6+</sup> Stock  
 0.1ml 524-02281102 (1001ppm Cr<sup>6+</sup>; exp: 3/1/12)  
 ↑ 100ml w/ pH ADJUSTED DI (pH=9.426)  
 EXP: 3/1/12

8/23/11 524-08231102 2.50ppb Cr<sup>6+</sup> ICA/CA  
<sup>0.25</sup>  
~~0.5~~ mL Ref 524-0157001 @ <sup>4.1</sup>/<sub>10</sub> exp: 3/20/12 up to 100  
 mL with pH adjusted (pH=9.426), degassed DI Water.

EXP: 9/6/11

8/24/11 S24-08241101 Sulfanilamide Soln  
Ja 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
EXP: 1/6/16 DISSOLVED IN 50ml CONC HCl  
(EMD 49260; EXP: 2/7/16) ↑ 500ml W/DI H<sub>2</sub>O  
EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
(JT BAKER H22587; EXP: 10/19/14) ↑ 250ml W/DI  
H<sub>2</sub>O.  
EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
Ja 5.6ml CONC H<sub>2</sub>SO<sub>4</sub> (EMD 49384; EXP: 11/20/14)  
↑ 2L W/DI H<sub>2</sub>O  
EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr6+ STD  
Ja 1.0ml S24-02281102 (1000PPM Cr6+; EXP: 3/1/12)  
↑ 100ml W/DI H<sub>2</sub>O  
EXP: 5/28/12

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## LABORATORY REPORT

September 9, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on September 6, 2011. For your reference, these analyses have been assigned our service request number P1103410.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 7:52 am, Sep 09, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103410

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## CASE NARRATIVE

The samples were received intact under chain of custody on September 6, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103410

Date Received: 9/6/2011  
 Time Received: 14:22

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-26-2	P1103410-001	Water	9/6/2011	09:17	X
MW-26-1	P1103410-002	Water	9/6/2011	09:36	X
MW-25-5	P1103410-003	Water	9/6/2011	10:50	X
MW-25-4	P1103410-004	Water	9/6/2011	11:17	X
MW-25-3	P1103410-005	Water	9/6/2011	11:42	X
MW-25-2	P1103410-006	Water	9/6/2011	12:10	X
MW-25-1	P1103410-007	Water	9/6/2011	12:31	X
DUPE-05-3Q11	P1103410-008	Water	9/6/2011	00:00	X
EB-10-09/06/11	P1103410-009	Water	9/6/2011	09:45	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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.



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

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

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

CAS Project No. 9103410  
 CAS Contact:

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

Project Name  
**SEL.GW.MON 3011**  
 Project Number 00006114  
~~00006114~~ 003

Project Manager  
**DAVID CONNER**  
 P.O. # / Billing Information  
 285651 / BATTELLE  
 ATTN: GENERAL TOMPKINS  
 505 KING AVE.  
 COLUMBUS OH 43201

Phone  
**(619) 726-7311** Fax  
**(619) 458-6614**  
 Email Address for Result Reporting  
**David.Conner@batelle.com**

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Sampler (Print & Sign)
MW-26-2	①	9/6/11	0917	W	1	<i>[Signature]</i>
MW-26-1	②	9/6/11	0938	W	1	<i>[Signature]</i>
MW-25-5	③	9/6/11	1050	W	1	<i>[Signature]</i>
MW-25-4	④	9/6/11	1117	W	1	<i>[Signature]</i>
MW-25-3	⑤	9/6/11	1142	W	1	<i>[Signature]</i>
MW-25-2	⑥	9/6/11	1210	W	1	<i>[Signature]</i>
MW-25-1	⑦	9/6/11	1231	W	1	<i>[Signature]</i>
DUPR-05-3011	⑧	9/6/11	-	W	1	<i>[Signature]</i>
ES-10-09/06/11	⑨	9/6/11	0945	W	1	<i>[Signature]</i>

Analysis Method and/or Analytes	Preservative Code
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted)	
Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	
CR VI (7196)	

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

**Report Tier Levels - please select**

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

Relinquished by: (Signature) *[Signature]* Date: 9/6/11 Time: 1412 Received by: (Signature) *[Signature]*  
 Relinquished by: (Signature) *[Signature]* Date: 9/6/11 Time: 1412 Received by: (Signature) *[Signature]*

Project Requirements (MRLs, GAPP)  
 Cooler / Blank / Ice / No Ice WATER  
 Temperature 2 °C

**Client:** Battelle

**Service Request:** P1103410

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103410-001.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-002.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-003.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-004.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-005.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1446	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-006.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-007.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-008.01	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	



**Client:** Battelle

**Service Request:** P1103410

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
	7196A				
		9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
P1103410-009.01					
	7196A				
		9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11	1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	

**Sample Acceptance Check Form**

Client: Battelle Work order: P1103410

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 9/6/11 Date opened: 9/6/11 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.

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103410-001.01	125mL Plastic NP					
P1103410-002.01	125mL Plastic NP					
P1103410-003.01	125mL Plastic NP					
P1103410-004.01	125mL Plastic NP					
P1103410-005.01	125mL Plastic NP					
P1103410-006.01	125mL Plastic NP					
P1103410-007.01	125mL Plastic NP					
P1103410-008.01	125mL Plastic NP					

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



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103410  
 Date Collected : 09/06/11  
 Date Received : 09/06/11

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	P1103410-001	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-26-1	P1103410-002	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-25-5	P1103410-003	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-25-4	P1103410-004	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-25-3	P1103410-005	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-25-2	P1103410-006	0.010	0.003	1	NA	09/06/11 15:40	ND	
MW-25-1	P1103410-007	0.010	0.003	1	NA	09/06/11 15:40	ND	
DUPE-05-3Q11	P1103410-008	0.010	0.003	1	NA	09/06/11 15:40	ND	
EB-10-09/06/11	P1103410-009	0.010	0.003	1	NA	09/06/11 15:40	ND	
Method Blank	P1103410-MB	0.010	0.003	1	NA	09/06/11 15:40	ND	

Approved By Kam Rya Date : 9/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103410  
**Date Analyzed:** 09/06/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 9/6/11  
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

Service Request: P1103410  
Date Analyzed: 09/06/11

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	0.0500	0.0506	101	90-110
CCV1	0.0500	0.0506	101	90-110
CCV2	0.0500	0.0514	103	90-110

Approved By: Karen Rya Date: 9/10/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
Project Name : JPL GW Mon 3Q11  
Project Number : 100006114  
Sample Matrix : WATER

Service Request : P1103410  
Date Collected : NA  
Date Received : NA  
Date Extracted : NA  
Date Analyzed : 09/06/11

Laboratory Control Sample Summary  
Inorganic Parameters

Sample Name : Laboratory Control Sample  
Lab Code : P1103410-LCS  
Test Notes :

Units : mg/L (ppm)  
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0382	96	90-110	

Approved By

*Kam Rya*

Date :

*9/10/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103410  
 Date Collected : 09/06/11  
 Date Received : 09/06/11  
 Date Extracted : NA  
 Date Analyzed : 09/06/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-26-2 Units : mg/L (ppm)  
 Lab Code : P1103410-001MS P1103410-001DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0426	0.0426	85	85	73-119	<1	

Approved By Karen Rya Date : 9/10/11



# pH Run Log

Service Request #(s): P1103410

Time: 0953

Sample	VWR lot #	Exp.
pH 2 Buffer	524-05201101	12/2012
pH 4 Buffer	524-09201102	9/30/12
pH 7 Buffer	524-04271102B	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.7%	✓
	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
pH 2.000	5	2.011	21.4°
pH 4.000	↓	4.008	21.5°
pH 7.000	↓	7.003	21.5°
pH 10.000	↓	9.999	21.6°
Ref#: 524-05201103	↓	7.381	21.7°
DI	↓	2.072	21.5°
pH 2.000	✓	2.000	21.6°
TIME: 1505	✓		
pH 2.000	5	2.006	20.8°
P1103410-1.01	↓	1.774	14.1°
-2.01	↓	1.962	14.8°
-3.01	↓	1.954	14.0°
-4.01	↓	1.889	14.7°
-5.01	↓	2.018	14.8°
-6.01	↓	1.842	14.7°
-7.01	↓	1.733	15.2°
✓ -8.01	↓	1.910	15.2°

Sample	#	pH	Temp. °C
P1103410-9.01	5	2.084	15.6°
pH 2.000	5	2.018	20.6°
SPACE NOT USED			

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> END 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: 9/6/11

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

Analyst: [Signature]

Date: 9/6/11

Reviewer: PR

Date: 9/6/11

Method EPA 7196A

Service Request#(s): P1103410

Run#: 260425

Stock#: 524-08291102 T.V.=100PPM EXP: 2/29/12

Prep Run#: \_\_\_\_\_

CV/CCV#: 524-10151001 T.V.=100PPM EXP: 3/30/12

Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: FMD 49284

Coloring Reagent Ref#: 524-09061101 EXP: 10/6/11

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	0.999908467
Absorbance @ 540 nm	0.000	0.010	0.057	0.113	

Sample #	Sample Vol.(mL)	pH / Dilution	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICB	10ml	- / ✓	0.000	0.000	0.000	0.000426	10.003
ICV 0.050PPM		- / ✓	0.000	0.057	0.057	0.0506	101%
MB		- / ✓	0.000	0.000	0.000	0.000426	10.003
LCS 0.04PPM		- / ✓	0.000	0.043	0.043	0.0382	96%
P1103410-1.01		- / ✓	0.000	0.001	0.001	0.00130	10.003
-1.01MS 0.05PPM		- / ✓	0.000	0.048	0.048	0.0426	85% 7.1%
-1.01MSD		- / ✓	0.000	0.048	0.048	0.0426	85% 5.1%
-2.01		- / ✓	0.000	0.000	0.000	0.000426	10.003
-2.01VS 0.03PPM		- / ✓	0.000	0.029	0.029	0.0259	86%
-3.01		- / ✓	0.000	0.000	0.000	0.000426	10.003
-4.01		- / ✓	0.000	0.000	0.000	0.000426	
-5.01		- / ✓	0.000	0.002	0.002	0.00218	
CVI 0.05PPM		- / ✓	0.000	0.057	0.057	0.0506	101%
ICB1		- / ✓	0.000	0.000	0.000	0.000426	10.003
P1103410-6.01		- / ✓	0.000	0.000	0.000		
-7.01		- / ✓	0.005	0.005	0.000		
-8.01		- / ✓	0.000	0.000	0.000		

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

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10% ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-08291102 ↑ 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 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 9/6/11 @ 1525  
 Date/Time: 9/6/11 @ 1540  
 Date: 11/10/11

Method EPA 7196A

Request#(s): P1103410 Run#: 260425  
 Lab#: S24-08291102 T.V.=100PPM EXP: 2/29/12 Prep Run#: \_\_\_\_\_  
 ICCV#: S24-10151001 T.V.=100PPM EXP: 3/30/12 Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP: 11/20/14  
 Coloring Reagent Ref#: S24-09061101 EXP: 10/6/11

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	0.999908467
Absorbance @ 540 nm	0.000	0.010	0.057	0.113	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
P1103410-9.01	10ml	-	✓	0.000	0.000	0.000	0.000426	10.00%
CCV2	↓	-	✓	0.000	0.058	0.058	0.0514	103%
CCB2	↓	-	✓	0.000	0.000	0.000	0.000426	10.10%
space not used								

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

ICV/CCV spiked with 0.25 ml of S24-10151001 @ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-08291102 ↑ 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 ml of sample (T.V.= 0.03 ppm)

Comments: SW 9/6/11

Prepared By: [Signature]  
 Analyzed By: [Signature]  
 Reviewed By: [Signature]

Date/Time: 9/6/11 @ 1525  
 Date/Time: 9/6/11 @ 1540  
 Date: 9/6/11

10/6/10  
SW

524-10061001 25133ppb stock for O<sub>3</sub>

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ;Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW

524-10061002 25133ppb ION/CON for O<sub>3</sub>

0.05 ml Pyridine-4-carboxaldehyde TCI  
(IC<sub>9</sub>INC ;Exp: 8/10/12 ) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SW

524-10061003 MBTH S/17

0.5000 g MBTH (Aldrich 54696EK ;Exp: 8/7/14 ) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 44284; EXP 11/2

EXP: 10/7/10

10/15/10  
SW

524-10151001 Cr<sup>6+</sup> ION/CON Stock

Purchased Ricca Chemical Co 100ppm Cr<sup>6+</sup>  
Cut No 2095-16

500ml Plastic  
LOT # 1010177  
EXP: 3/20/12

10/15/10  
SW

524-10151002 500ppm NO<sub>2</sub> Stock

Purchased RECA Chemical Co Cut No: 5444-5-4

LOT # 1010271 120ml amber glass

2/21/11  
JW 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI. COOL  
COMPLETELY  
EXP: 2/21/12

2/21/11  
JW 524-0221102 Orbt Coloring Reagent  
0.2500g 1,5-diphenylcarbohydrazide (EMD LOT 471032  
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
LOT # 471540; EXP: 9/24/12).  
EXP: 3/31/11

2/28/11  
JW 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
w/ DI H<sub>2</sub>O  
EXP: 2/28/12

2/28/11  
JW 524-0228102 1001<sup>mg</sup> Orbt  
Purchased  
Inorganic Ventures CGCR(6)1-1  
125 mL Clear Glass  
LOT# D2-CR03040  
EXP: 3/1/2012

524-04261102 pH 10.000 Buffer  
4/26/11 Purchased  
SN JT Baker Cat No: 5655-01 (500ml)  
LOT # J33524  
EXP: 9/30/12

4/26/11 524-04261103 NH3 FILLING SOLN  
SN Purchased  
Thermo Orion Orion 951202 (60ml)  
LOT # 0X1 P/N: 70263-A04  
EXP: 4/26/12

4/26/11 524-0426110~~3~~<sup>4</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
SN 250ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284, EXP: 11/20/14)  
ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
LET COOL  
EXP: 4/26/12

4/27/11 524-04271101 Amine Sulfuric Soln  
SN 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (CMD 49284; EXP: 11/20/14) Added:  
2.5ml DI H<sub>2</sub>O. Let Cool.  
DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine  
oxalate (Fulka 1363386 B408209; EXP: 8/7/14)  
in cooled sulfuric soln and dilute to 250ml w/  
1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
EXP: 5/25/11

4/27/11  
JA  
524-04271102 A&B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500mL  
LOT # 1163379  
EXP: 3/20/13

4/28/11  
JA  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L w/ DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
JA  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L w/ DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
JA  
524-05051101 Ortol Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
EXP: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
JA  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L w/ DI H<sub>2</sub>O - Degassed

5/19/11  
Jr

524-0591103 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT Baker <sup>JT Baker</sup> AD806 exp: 5/13/16) in 100 mL Methanol (B&J AD806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

524-05201101 pH 2.000 BUFFER

Purchased

BDH CAT. No. BDH 5010-500 mL

LOT# 1101225

EXP: 12/2012

5/20/11  
Jr

524-05201102 pH 4.000 BUFFER

Purchased

JT Baker CAT# 5657-01 500mL

LOT# J36503

EXP: 9/30/12

5/22/11  
Jr

524-05201103 pH 7.38 BUFFER

Purchased

BDH CAT# BDH5058-500mL

LOT# 1103361

EX: 3/2013



8/24/11 S24-08241101 Sulfanilamide Soln  
 5.00g Sulfanilamide (JT Baker; Lot# J32618;  
 EXP: 1/6/16) DISSOLVED IN 50ml Conc HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/ DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/ DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/ DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr6+ Std  
 1.0ml S24-02281102 (1000ppm Cr6+; EXP: 3/1/12)  
 ↑ 100ml w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

9/6/11 S24-09061101 Cr6+ Coloring Reagent  
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD 47154D  
 EXP: 9/24/12).  
 EXP: 10/6/11

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## LABORATORY REPORT

September 9, 2011

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

**RE: JPL GW Mon 3Q11 / 100006114**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on September 7, 2011. For your reference, these analyses have been assigned our service request number P1103428.

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](http://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-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; 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.**



Digitally Signed By Sue Anderson at 7:59 am, Sep 09, 2011

Sue Anderson  
Project Manager

Client: Battelle  
Project: JPL GW Mon 3Q11 / 100006114

CAS Project No: P1103428

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## CASE NARRATIVE

The samples were received intact under chain of custody on September 7, 2011 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.

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*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.*

*Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**DETAIL SUMMARY REPORT**

Client: Battelle  
 Project ID: JPL GW Mon 3Q11 / 100006114

Service Request: P1103428

Date Received: 9/7/2011  
 Time Received: 15:17

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-12-3	P1103428-001	Water	9/7/2011	09:51	X
MW-12-2	P1103428-002	Water	9/7/2011	10:11	X
MW-12-1	P1103428-003	Water	9/7/2011	10:42	X
EB-11-09/07/11	P1103428-004	Water	9/7/2011	10:29	X
MW-11-3	P1103428-005	Water	9/7/2011	12:16	X
MW-11-2	P1103428-006	Water	9/7/2011	12:38	X
MW-11-1	P1103428-007	Water	9/7/2011	13:16	X
DUPE-06-3Q11	P1103428-008	Water	9/7/2011	00:00	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 <i>tert</i> -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	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , 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

**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. P1103425  
CAS Contact:

Company Name & Address (Reporting Information)

**BATTLE**  
3990 OLD TOWN AVE, CROS  
SAN DIEGO, CA 92110

Project Name

SPR for WND 3011  
Project Number  
00006114

P.O. # / Billing Information

785651 / BATTLE  
ATTN: GERRARD TOMPKINS  
505 KINK AVE.  
COLLEGE BUS, OFF 43201

Project Manager

DAVID CONVEN

Phone

(619) 726-7311

Fax

(619) 458-6614

Email Address for Result Reporting

CHABE BRADSHAW

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

Analysis Method and/or Analytes

Remarks

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/>	TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/>	TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted)	TPH FC <input type="checkbox"/> 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	Preservative Code	Analysis Method and/or Analytes	Remarks
MW-12-3	①	9/7/11	0951	W	1								
MW-12-2	②		1011	W	1								
MW-12-1	③		1042	W	2								
ES-11-09/07/11	④		1029	W	1								EMPTY BLANK
MW-11-3	⑤		1216	W	1								
MW-11-2	⑥		1238	W	1								
MW-11-1	⑦		1316	W	1								
Dupe-06-3011	⑧	9/7/11		W	1								DUPLICATE

Report Tier Levels - please select

Tier I - (Results/Default if not specified) \_\_\_\_\_

Tier III - (Data Validation Package) 10% Surcharge \_\_\_\_\_

MRL required Yes / No

EDD required Yes / No

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature) \_\_\_\_\_ Date: 9/7/11 Time: 1400

Relinquished by: (Signature) \_\_\_\_\_ Date: 9/7/11 Time: 1517

Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Temperature: 20c °C

**Client:** Battelle

**Service Request:** P1103428

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103428-001.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-002.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-003.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-003.02		9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-004.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-005.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-006.01	7196A	9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-007.01	7196A				

**Client:** Battelle

**Service Request:** P1103428

**Project:** JPL GW Mon 3Q11/100006114

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
<hr/>					
P1103428-008.01	7196A				
		9/7/11	1537	SMO / MZAMORA	
		9/7/11	1537	P-37 / MZAMORA	
		9/7/11	1559	In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	



**Sample Acceptance Check Form**

Client: Battelle Work order: P1103428

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on: 9/7/11 Date opened: 9/7/11 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 <b>sample containers</b> properly marked with client sample ID?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</b> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: 2° C Blank Temperature: ° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Wet Ice</b>   |                                     |                                     |                                     |
| 9 Was a <b>trip blank</b> received?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 Were <b>custody seals</b> on outside of cooler/Box?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?                                  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103428-001.01	125mL Plastic NP					
P1103428-002.01	125mL Plastic NP					
P1103428-003.01	125mL Plastic NP					
P1103428-003.02	125mL Plastic NP					
P1103428-004.01	125mL Plastic NP					
P1103428-005.01	125mL Plastic NP					
P1103428-006.01	125mL Plastic NP					
P1103428-007.01	125mL Plastic NP					

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



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client :** Battelle  
**Project Name :** JPL GW Mon 3Q11  
**Project Number :** 100006114  
**Sample Matrix :** WATER

**Service Request :** P1103428  
**Date Collected :** 09/07/11  
**Date Received :** 09/07/11

Chromium, Hexavalent

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

Units : mg/L (ppm)  
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-3	P1103428-001	0.010	0.003	1	NA	09/07/11 16:40	ND	
MW-12-2	P1103428-002	0.010	0.003	1	NA	09/07/11 16:40	ND	
MW-12-1	P1103428-003	0.010	0.003	1	NA	09/07/11 16:40	ND	
EB-11-09/07/11	P1103428-004	0.010	0.003	1	NA	09/07/11 16:40	ND	
MW-11-3	P1103428-005	0.010	0.003	1	NA	09/07/11 16:40	ND	
MW-11-2	P1103428-006	0.010	0.003	1	NA	09/07/11 16:40	ND	
MW-11-1	P1103428-007	0.010	0.003	1	NA	09/07/11 16:40	ND	
DUPE-06-3Q11	P1103428-008	0.010	0.003	1	NA	09/07/11 16:40	ND	
Method Blank	P1103428-MB	0.010	0.003	1	NA	09/07/11 16:40	ND	

Approved By           *Kam Rya*           Date :           *9/8/11*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103428  
**Date Analyzed:** 09/07/11

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

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_\_

*Karu Rya*

Date: \_\_\_\_\_

*9/8/11*

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle  
**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103428  
**Date Analyzed:** 09/07/11

**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	0.0500	0.0504	101	90-110
CCV1	0.0500	0.0513	103	90-110
CCV2	0.0500	0.0513	103	90-110

Approved By: Kam Rya Date: 9/8/11  
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103428  
 Date Collected : NA  
 Date Received : NA  
 Date Extracted : NA  
 Date Analyzed : 09/07/11

Laboratory Control Sample Summary  
 Inorganic Parameters

Sample Name : Laboratory Control Sample  
 Lab Code : P1103428-LCS  
 Test Notes :

Units : mg/L (ppm)  
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0407	102	90-110	

Approved By Kam Rya

Date : 9/8/11

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

Client : Battelle  
 Project Name : JPL GW Mon 3Q11  
 Project Number : 100006114  
 Sample Matrix : WATER

Service Request : P1103428  
 Date Collected : 09/07/11  
 Date Received : 09/07/11  
 Date Extracted : NA  
 Date Analyzed : 09/07/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-12-1 Units : mg/L (ppm)  
 Lab Code : P1103428-003MS P1103428-003DMS Basis : NA  
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0415	0.0415	83	83	73-119	<1	

Approved By                     *Karen Rya*                     Date :                     *9/8/11*

**pH Run Log**

*P1103428*

Service Request #(s): \_\_\_\_\_

Time: *0725*

Sample	VWR lot #	Exp.
pH 2 Buffer	<i>S24-04261101</i>	<i>12/20/12</i>
pH 4 Buffer	<i>S24-04261102</i>	<i>9/30/12</i>
pH 7 Buffer	<i>S24-04261102</i>	<i>3/20/13</i>
pH 10 Buffer	<i>S24-04261102</i>	<i>9/30/12</i>

Slope	Prep.Run #
<i>98.0%</i>	—
	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	<i>5</i>	<i>2.006</i>	<i>20.5°</i>
pH 4.000	↓	<i>4.024</i>	<i>21.4°</i>
pH 7.000	↓	<i>7.016</i>	<i>21.6°</i>
pH 10.000	↓	<i>10.015</i>	<i>21.5°</i>
Ref#:		<i>7.403</i>	<i>21.8°</i>
DI		<i>1.994</i>	<i>21.6°</i>
pH 2.000	↓	<i>2.002</i>	<i>20.4°</i>
TIME: <i>1600</i>		<i>Stc</i>	
pH 2.000	<i>5</i>	<i>2.012</i>	<i>20.8°</i>
<i>P1103428-1.01</i>	↓	<i>2.089</i>	<i>11.4°</i>
<i>-2.01</i>	↓	<i>2.021</i>	<i>11.3°</i>
<i>-3.01</i>	↓	<i>1.902</i>	<i>13.2°</i>
<i>-4.01</i>	↓	<i>1.806</i>	<i>12.7°</i>
<i>-5.01</i>	↓	<i>1.833</i>	<i>12.6°</i>
<i>-6.01</i>	↓	<i>1.876</i>	<i>13.2°</i>
<i>-7.01</i>	↓	<i>1.944</i>	<i>13.4°</i>
<i>-8.01</i>	↓	<i>1.831</i>	<i>13.6°</i>

Sample	#	pH	Temp. °C
pH 2.000	<i>5</i>	<i>2.019</i>	<i>20.4°</i>
<i>Handwritten notes and scribbles</i>			

pH Adjustments:  7196A: Diluted/Conc H<sub>2</sub>SO<sub>4</sub> EMP *49289* 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: *9/6/11*

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

Analyst: *SW*  
 Reviewer: *KL*

Date: *9/7/11*  
 Date: *9/8/11*



Method EPA 7196A

Service Request#(s): P1103428

Run#: 260647

Stock#: S24-08291102 T.V.=100PPM EXP. 2/29/12

Prep Run#:

ICV/CCV#: S2-10161001 T.V.=100PPM EXP. 3/20/12

Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: EMD 49284 EXP. 11/30/14

Coloring Reagent Ref#: S24-09061101 EXP. 10/6/11

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	0.99998128
Absorbance @ 540 nm	0.000	0.011	0.057	0.113	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	ICV 0.05PPM	10ml	✓	0.000	0.000	0.000	0.0000356	10.003
2	MB	-	✓	0.000	0.000	0.000	0.0000356	10.003
3	LCS 0.04PPM	-	✓	0.000	0.046	0.046	0.0407	102%
4	P1103428-1.01	-	✓	0.000	0.000	0.000	0.0000356	10.003
5	-1.01 VS 0.03PPM	-	✓	0.000	0.030	0.030	0.0265	88%
6	-2.01	-	✓	0.000	0.001	0.001	0.000919	10.003
7	-3.01	-	✓	0.000	0.000	0.000	0.0000356	10.003
8	-3.01 MS 0.05PPM	-	✓	0.000	0.047	0.047	0.0415	83% 7
9	-3.01 MSD ↓	-	✓	0.000	0.047	0.047	0.0415	85% 7
10	-4.01	-	✓	0.000	0.001	0.001	0.000919	10.003
11	-5.01	-	✓	0.000	0.003	0.001	↓	↓
12	CCV 0.05PPM	-	✓	0.000	0.058	0.058	0.0513	103%
13	P1103428-6.01	-	✓	0.000	0.000	0.000	0.0000356	10.003
14	-7.01	-	✓	0.000	0.000	0.000	0.0000356	↓
15	-8.01	-	✓	0.000	0.000	0.000	↓	↓
16	CCV 2 0.05PPM	-	✓	0.000	0.058	0.058	0.0513	103%
17	CCV	-	✓	0.000	0.000	0.000	0.0000356	10.003

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

ICV/CCV spiked with 0.25 ml of S24-10151001 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-08291102 ↑ 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 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 9/2/11 @ 1625

Analyzed By: [Signature]

Date/Time: 9/2/11 @ 1640

Reviewed By: [Signature]

Date: 9/8/11

10/6/10  
SA524-10061001 25133 ppb Stock for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar  
10146598 ; Exp: 8/11/12 up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-10061002 25133 ppb ION/CON for O<sub>3</sub>0.05 ml Pyridine-4-carboxaldehyde TCI  
(IGINC ; Exp: 8/10/12) up to 500 ml w/ DI  
Water.

EXP: 10/20/10

10/6/10  
SA524-10061003 MBTH Sol'n0.5000 g MBTH (Aldrich 54696EK ; Exp: 8/7/14) up  
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H<sub>2</sub>SO<sub>4</sub> EMD 49284; EXP 11/20

EXP: 10/7/10

10/15/10  
SA524-10151001 Cr6+ ION/CON Stock  
Purchased 100PPM Cr6+  
Ricca Chemical Co Cut No 2095-16  
500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10  
SA524-10151002 500PPM NO<sub>2</sub> StockPurchased  
Ricca Chemical Co Cut No: 5444-5-4  
LOT # 1010271 120ml amber glass

2/21/11  
 JG 524-0221101 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI. COOL  
 COMPLETELY  
 EXP: 2/21/12

2/21/11  
 JG 524-0221102 Orbt Coloring Reagent  
 0.2500g 1,5-diphenylcarbohydrazide (EMD Lot 471031  
 EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD  
 Lot #471540; EXP: 9/24/12).  
 EXP: 3/31/11

2/28/11  
 JG 524-0228101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 5.6 ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284 EXP: 11/20/14) ↑  
 w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

2/28/11  
 JG 524-0228102 1001 mg/L Orbt  
 Purchased  
 Inorganic Ventures CGCR(6)1-1  
 125ml Clear Glass  
 Lot# D2-CR03040  
 EXP: 3/1/2012

4/26/11  
 SV  
 524-04261102 pH 10.000 Buffer  
 Purchased  
 JT Baker Cat No: 5655-01 (500ml)  
 Lot # J33524  
 EXP: 9/30/12

4/26/11  
 SV  
 524-04261103 NH3 Fuming Soln  
 Purchased  
 Thermo Orion Orion 951202 (60ml)  
 Lot # 0X1 P/N: 70243-A04  
 EXP: 4/26/12

4/26/11  
 SV  
 524-04261104 <sup>9/26/11</sup> 1:1 H<sub>2</sub>SO<sub>4</sub>  
 250ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ADDED SLOWLY TO 250ml DI H<sub>2</sub>O  
 LET COOL  
 EXP: 4/26/12

4/27/11  
 SV  
 524-04271101 Ammonio Sulfuric Soln  
 6.25ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14) Added:  
 2.5ml DI H<sub>2</sub>O. Let Cool.  
 Dissolve 1.6875g N,N-dimethyl-p-phenylenediamin  
 oxalate (Fulca 1363386 13408204; EXP: 8/7/14)  
 in cooled sulfuric soln and dilute to 250ml w/  
 1:1 H<sub>2</sub>SO<sub>4</sub> (524-04261104; EXP: 4/26/12)  
 EXP: 5/25/11

4/27/11  
Sr  
524-04271102 A & B pH 7.000 Buffer  
Purchased  
BDH Cat No: BDH5046-500 mL  
LOT # 1163379  
EXP: 3/20/13

4/28/11  
Sr  
524-04281101 0.1N H<sub>2</sub>SO<sub>4</sub>  
5.6 ml conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
↑ 2L w/ DI H<sub>2</sub>O  
EXP: 4/28/12

5/4/11  
Sr  
524-05041101 Alkaline Digestion Soln  
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +  
30.0g Na<sub>2</sub>CO<sub>3</sub> (EMD 46321715B; EXP: 10/11/12)  
↑ 1L w/ DI H<sub>2</sub>O  
EXP: 06/04/11

5/6/11  
Sr  
524-05051101 Crlet Coloring reagent  
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05841;  
EXP: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;  
EXP: 9/24/12).  
EXP: 06/05/11

6/5/11  
Sr  
524-05051102 ICO<sub>2</sub> Eluent  
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)  
↑ 1L w/ DI H<sub>2</sub>O - De-gassed

5/19/11  
Jr

524-05191103 IC02 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (JT BAKER EM 305641 exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 5/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 44284 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 5/24/11

5/20/11  
Jr

524-05201101 PH 2.000 BUFFER  
Purchased

BDH CAT. No. BDH 5010-500 mL  
LOT# 1101225  
EXP: 12/2012

5/20/11  
Jr

524-05201102 PH 4.000 BUFFER  
Purchased  
JT Baker CAT# 5657-01 500mL  
LOT# J36503  
EXP: 9/30/12

5/22/11  
Jr

524-05201103 pH 7.38 BUFFER  
Purchased  
BDH CAT# BDH5058-500mL  
LOT# 1103361  
EX: 3/2013

8/24/11 S24-08241101 Sulfanilamide Soln  
 Ja 5.00g Sulfanilamide (JT Baker; lot# J32618;  
 EXP: 1/6/16) DISSOLVED in 50ml Conc HCl  
 (EMD 49260; EXP: 2/7/16) ↑ 500ml w/ DI H<sub>2</sub>O  
 EXP: 8/24/12

8/24/11 S24-08241102 NEDA Soln  
 Ja 0.2500g N-1-Naphthylethylenediamine dihydrochloride  
 (JT BAKER H22587; EXP: 10/19/14) ↑ 250ml w/ DI  
 H<sub>2</sub>O.  
 EXP: 2/24/12

8/29/11 S24-08291101 0.1N H<sub>2</sub>SO<sub>4</sub>  
 Ja 5.6ml Conc H<sub>2</sub>SO<sub>4</sub> (EMD 49284; EXP: 11/20/14)  
 ↑ 2L w/ DI H<sub>2</sub>O  
 EXP: 8/29/12

8/29/11 S24-08291102 10PPM Cr6+ Std  
 Ja 1.0ml S24-02281102 (1000PPM Cr6+; EXP: 3/1/12)  
 ↑ 100ml w/ DI H<sub>2</sub>O  
 EXP: 2/28/12

9/6/11 S24-09061101 Cr6+ Coloring Reagent  
 Ja 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J55641;  
 EXP: 6/15/15) ↑ 50ml w/ Acetone (EMD 47154D)  
 EXP: 9/24/12).  
 EXP: 10/6/11