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

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



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

		Cooler remp.	
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**

		1440
Alpha's Sample ID	Test Reference	<u>Analyte</u>
I1082403-01A	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

Kandy Saulner

Walter Aire



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#### ANALYTICAL REPORT

**Battelle Memorial Institute** 655 West Broadway San Diego, CA 92101

**David Conner** Attn:

(619) 726-7311 Phone:

(614) 458-6641 Fax:

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: BMI11082403-10A	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

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

#### Perchlorate by Ion Chromatography EPA Method 314.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-19-5 Lab ID: BM111082403-01A Date Sampled 08/23/11 09:29	Perchlorate	2.32	1.00 μg/L	08/31/11 11:06	08/31/11 13:04
Client ID: MW-19-4 Lab ID: BMI11082403-02A Date Sampled 08/23/11 09:58	Perchlorate	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: BMI11082403-03A Date Sampled 08/23/11 10:21	Perchlorate	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: BM111082403-04A Date Sampled 08/23/11 10:52	Perchlorate	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: BM111082403-05A Date Sampled 08/23/11 11:36	Perchlorate .	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: BMI11082403-06A Date Sampled 08/23/11 00:00	Perchlorate	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: BMI11082403-07A Date Sampled 08/23/11 11:20	Perchlorate	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: BMI11082403-09A Date Sampled 08/23/11 11:29	Perchlorate	ND	1.00 μg/L	08/31/11 11:06	08/31/11 15:50
Client ID: <b>MW-7</b> Lab ID: BMI11082403-10A Date Sampled 08/23/11 10:35	Perchlorate	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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#### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 655 West Broadway San Diego, CA 92101

David Conner Attn:

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

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: BMI11082403-07A Date Sampled 08/23/11 11:20	Chromium (Cr)	ND	0.0050 mg/L	08/25/11	08/29/11
Client ID: SB-01-8/23/11 Lab ID: BMI11082403-09A Date Sampled 08/23/11 11:29	Chromium (Cr)	ND	0.0050 mg/L	08/25/11	08/29/11
Client ID: MW-7 Lab ID: BMI11082403-10A Date Sampled 08/23/11 10:35	Chromium (Cr)	0.079	0.0050 mg/L	08/25/11	08/29/11

ND = Not Detected

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

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

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**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101 Phone: (619) 726-7311 Fax: (614) 458-6641

Attn: David Conner

Job: 100006114/JP

100006114/JPL Groundwater Monitoring

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

			Estimated		
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID: MW-19-5 Lab ID: BMI11082403-01A Date Received: 08/24/11 Date Sampled: 08/23/11 09:29	*** None Found ***	ND	2.0 μg/L	08/25/11 13:16	08/25/11 13:16
Client ID: MW-19-4 Lab ID: BMI11082403-02A Date Received: 08/24/11 Date Sampled: 08/23/11 09:58	*** None Found ***	ND	2.0 μg/L	08/25/11 13:59	08/25/11 13:59
Client ID: MW-19-3 Lab ID: BMI11082403-03A Date Received: 08/24/11 Date Sampled: 08/23/11 10:21	*** None Found ***	ND	2.0 μg/L	08/25/11 14:21	08/25/11 14:21
Client ID: MW-19-2 Lab ID: BMI11082403-04A Date Received: 08/24/11 Date Sampled: 08/23/11 10:52	* * * None Found * * *	ND	2.0 μg/L	08/25/11 14:42	08/25/11 14:42
Client ID: MW-19-1 Lab ID: BMI11082403-05A Date Received: 08/24/11 Date Sampled: 08/23/11 11:36	* * * None Found * * *	ND	2.0 μg/L	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	2.0 μg/L	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	2.0 μg/L	08/25/11 12:32	08/25/11 12:32
Client ID: TB-01-8/23/11 Lab ID: BMI11082403-08A Date Received: 08/24/11 Date Sampled: 08/23/11 07:00	*** None Found ***	ND	2.0 μg/L	08/25/11 12:11	08/25/11 12:11
Client ID: SB-01-8/23/11 Lab ID: BMI11082403-09A Date Received: 08/24/11 Date Sampled: 08/23/11 11:29	* * * None Found * * *	ND	2.0 μg/L	08/25/11 12:54	08/25/11 12:54



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Client ID: MW-7

Lab ID: BMI11082403-10A

Date Received: 08/24/11

Date Sampled: 08/23/11 10:35

ND

 $2.0~\mu g/L$ 

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

\* \* \* None Found \* \* \*

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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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082403-01A

Client I.D. Number: MW-19-5

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		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					

ND = Not Detected

27

28

29

38

39

40

41

42

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachioroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

0.89

0.50

2.5

0.50

0.50

0.50

0.50

0.50

5.0

0.50

1.0

0.50

0.50

0.50

0.50

0.50

0.50

µg/L

µg/L

μg/L

μg/L

μg/L

μg/L

µq/L

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

**Report Date** 

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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082403-02A

Client I.D. Number: MW-19-4

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		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 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					
^^	-1 4 0 D: 11		1						

0.50

0.50

0.50

0.50

0.50

5.0

0.50

1.0

0.50

0.50

0.50

0.50

0.50

0.50

0.50

ug/L

μq/L

µg/L

μg/L

μg/L

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachioroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

30

31

32

40

42

43

ND

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**Report Date** 

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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

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

**David Conner** 

Phone: (619) 726-7311 Fax:

(614) 458-6641

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

			Repoi	rting				Re	eporting
	Compound	Concentration	Lim	iit		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	Hexachiorobutadiene	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					

0.50

2.5

0.50

0.50

0.50

0.50

1.0

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

μg/L

µq/L

ug/L

μg/L

μg/L

μg/L

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Bromodichloromethane

cis-1,3-Dichloropropene

1.1.2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

31

33

34

35

36

38

40

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

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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



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#### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082403-04A

Client I.D. Number: MW-19-2

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

(614) 458-6641

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

			Repo	rting				R	eporting
	Compound	Concentration	Lim	nit		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	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

27

35

36

38

39

40

41

42

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Dibromochloromethane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

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Report Date

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

0.50

2.5

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

1.0

μg/L

μg/L

μg/L

µq/L

ug/L

μg/L

μg/L

µq/L

μg/L



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082403-05A

Client I.D. Number: MW-19-1

Attn: **David Conner** Phone: (619) 726-7311

Fax: (614) 458-6641

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		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-Butvibenzene	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

27

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36

38

39

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42

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Dibromochloromethane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

o-Xylene

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

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**Report Date** 

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

0.50

2.5

0.50

0.50

0.50

5.0

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

1.0

µg/L

μg/L



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#### ANALYTICAL REPORT

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082403-06A

Client I.D. Number: DUPE-01-3Q11

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

(614) 458-6641

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

			Repo	rting				R	eporting
-	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	Bromochioromethane	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-Bromofiuorobenzene	90	(70-130)	%REC
25	1,2-Dichloropropane	ND	0.50	μg/L		,		, , ,	
26	Trichloroethene	ND	0.50	ug/l					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

27

30

32

33

34

35

38

40

41

42

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

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0.50

2.5

0.50

0.50

0.50

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0.50

0.50

0.50

0.50

0.50

0.50

1.0

µg/L

μg/L

μg/L

ug/L

µg/L

μg/L

μg/L

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

Alpha Analytical Number: BMI11082403-07A

Client I.D. Number: EB-01-8/23/11

Attn:

David Conner

Phone:

(619) 726-7311

Fax:

(614) 458-6641

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		Compound	Concentration		Limit
1	Dichlorodifluoromethane	ND	0.50	μg/L	45	1,1,2,2-Tetrachioroethane	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Bromodichloromethane

cis-1,3-Dichloropropene

1.1.2-Trichloroethane

1,3-Dichloropropane

Tetrachioroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

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Roger Scholl

ND

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0.50

2.5

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

0.50

1.0 µq/L

μg/L

μg/L

μg/L

μg/L

μg/L

μg/L

µg/L

ug/L

µq/L

µq/L

μg/L

µg/L

µg/L

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

9/7/11 **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

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

Attn: **David Conner** 

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

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		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	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

27

28

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43

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Tetrachioroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1.2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyi-2-pentanone (MIBK)

Roger Scholl

ND

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.

0.50

2.5

0.50

0.50

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μg/L

9/7/11 Report Date



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

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

**David Conner** Attn:

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

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

			Repo	rting				Re	eporting
	Compound	Concentration	Lim	nit		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-Butvibenzene	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	ug/l					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Bromodichloromethane

cis-1,3-Dichloropropene

1.1.2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

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4-Methyl-2-pentanone (MIBK)

Roger Scholl

ND

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0.50

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μg/L

μg/L

Report Date



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Attn:

Fax:

Phone:

#### ANALYTICAL REPORT

David Conner

(619) 726-7311

(614) 458-6641

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

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

			Repo	rting				R	eporting
	Compound	Concentration	Lim	nit		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-Propvibenzene	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	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			**	1 (13 144)	
26	Trichloroethene	ND	0.50	µg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

27

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43

Bromodichloromethane

cis-1,3-Dichloropropene

1,1,2-Trichloroethane

1,3-Dichloropropane

Tetrachloroethene

Chlorobenzene

Ethylbenzene

m,p-Xylene

Bromoform

Styrene

o-Xylene

Dibromochloromethane

1,2-Dibromoethane (EDB)

1,1,1,2-Tetrachloroethane

Toluene

2-Hexanone

trans-1,3-Dichloropropene

4-Methyl-2-pentanone (MIBK)

Roger Scholl

1.2

ND

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.

Report Date Page 1 of 1

0.50

2.5

0.50

0.50

0.50

5.0

0.50

0.50

0.50

0.50

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0.50

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0.50

1.0 µq/L

μg/L

μg/L

µg/L

µq/L

μg/L

µq/L

µa/L

μg/L

μg/L



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# **VOC Sample Preservation Report**

Work Order: BMI11082403

Job:

100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН
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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<b>Date:</b> 26-Aug-11		(	QC Sι	ımmar	y Repor	t				<b>Work Orde</b> 11082403	
Method Blar File ID: 20	ık	<u>-</u>	Туре: М	•	est Code: EF atch ID: 2717		hod 300.0	•		08/24/2011 12:12	
Sample ID:	MB-27177	Units : mg/L			_1_110824A			Prep		08/24/2011 12:11	
Analyte		Result	PQL		SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %RPD(Limit)	Qual
Chloride Nitrite (NO2) -	N	ND ND	0.5 0.25								
Nitrate (NO3) -		ND	0.25								
Phosphate, ort	ho - P	ND	0.5								
Sulfate (SO4)		ND	0.5					·			
Laboratory :	Fortified Blank		Type: LI	FB T	est Code: <b>EF</b>	PA Met	hod 300.0				
File ID: <b>21</b>				Ва	atch ID: 2717	77		Analy	sis Date:	08/24/2011 12:31	
Sample ID:	LFB-27177	Units : mg/L			_1_110824A			Prep		08/24/2011 12:11	
Analyte	***************************************	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %RPD(Limit)	Qual
Chloride		48.4	0.5	50		97	90	110			
Nitrite (NO2) - Nitrate (NO2)		4.82	0.25			96	90	110			
Nitrate (NO3) - Phosphate, ort		5.2 5.45	0.25 0.5	5 5		104 109	90 90	110 110			
Sulfate (SO4)	110	100	0.5	-		100	90	110			
Sample Mat	rix Snike		Type: LI	FM T	est Code: EF	A Met	hod 300.0				
File ID: 28			• •		atch ID: 2717	77		Analy	sis Date:	08/24/2011 14:41	
Sample ID:	11082403-10ALFM	Units : mg/L		Run ID: IC	_1_110824A	١		Prep	Date:	08/24/2011 12:11	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %RPD(Limit)	Qual
Chloride		104	0.5		60.29	87	80	120			
Nitrite (NO2) - Nitrate (NO3) -		5.15	0.25	_	0		80	120 120			
Phosphate, ort		6.74 6.01	0.25 0.5	_	1.779 0	99 120	80 80	120			
Sulfate (SO4)		142	0.5		45.29	97	80	120			
Sample Mat	rix Spike Duplicate		Type: L	FMD T	est Code: EF	PA Met	thod 300.0				
File ID: <b>29</b>				В	atch ID: <b>271</b> 7	77		Analy	sis Date:	08/24/2011 14:59	
Sample ID:	11082403-10ALFMD	Units : mg/L		Run ID: IC	_1_1108244	1		Prep	Date:	08/24/2011 12:11	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %RPD(Limit)	Qual
Chloride		105	0.5		60.29	90	80	120	103.7	` '	
Nitrite (NO2) -		5.01	0.25		0	100	80	120	5.15	` '	
Nitrate (NO3) -		6.82	0.25		1.779	101	80	120	6.738		N.4.1
Phosphate, ort	110 - F	6.16	0.5		0 45 30	123	80 80	120	6.014	` '	M1
Sulfate (SO4)		143	0.5	100	45.29	98	80	120	142.1	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.



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<b>Date:</b> 06-Sep-11		(	QC S	umma	ry Repo	rt			<b>Work Ordo</b> 11082403	
Method Blank			Type: N	MBLK	Test Code: E	PA Met	thod 314.0			
File ID: 14				İ	Batch ID: 272	222		Analysis Date	e: <b>08/31/2011 12:09</b>	
Sample ID: M	IB-27222	Units : µg/L		Run ID: I	C_3_110831	A		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVa	l SpkRefVa	I %REC	LCL(ME)	UCL(ME) RPDR	efVal %RPD(Limit)	Qual
Perchlorate		ND	•	1						
Laboratory Fo	ortified Blank		Type: L	.FB	Test Code: E	PA Me	thod 314.0			
File ID: <b>15</b>				1	Batch ID: 272	222		Analysis Date	e: <b>08/31/2011 12:27</b>	
Sample ID: L	FB-27222	Units : µg/L		Run ID: I	C_3_110831	A		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVa	l SpkRefVa	%REC	LCL(ME)	UCL(ME) RPDR	efVal %RPD(Limit)	Qual
Perchlorate		24.3		2 2	5	97	85	115		
Sample Matrix	k Spike		Type: L	.FM	Test Code: E	PA Me	thod 314.0			
File ID: <b>21</b>					Batch ID: <b>27</b> 2	222		Analysis Dat	e: <b>08/31/2011 14:18</b>	
Sample ID: 1	1082403-04ALFM	Units : µg/L		Run ID: I	C_3_110831	A		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVa	l SpkRefVa	I %REC	C LCL(ME)	UCL(ME) RPDR	efVal %RPD(Limit)	Qual
Perchlorate		26.4		2 2	5 4.997	7 86	80	120		
Sample Matrix	x Spike Duplicate		Type: L	.FMD	Test Code: E	PA Me	thod 314.0			
File ID: <b>22</b>	•				Batch ID: 27	222		Analysis Dat	e: <b>08/31/2011 14:36</b>	
Sample ID: 1	1082403-04ALFMD	Units : µg/L		Run ID: I	C_3_110831	A		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVa	al SpkRefVa	I %REC	LCL(ME)	UCL(ME) RPDR	efVal %RPD(Limit)	Qual
Perchlorate		27.1		2 2	5 4.99	7 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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<b>Date:</b> 07-Sep-11	QC Summary Report	<b>Work Order:</b> 11082403
Method Blank File ID: 082911.B\071_M.D\ Sample ID: MB-27185	Type MBLK Test Code: EPA Method 200.8  Batch ID: 27185 Analysis Date: 08	
Analyte	Units : mg/L Run ID: ICP/MS_110829C Prep Date: 08 Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal	8/25/2011 15:17 %RPD(Limit) Qual
Chromium (Cr)	ND 0.005	76TC D(LIMIL) Qual
Laboratory Control Spike File ID: 082911.B\072_M.D\	Type LCS Test Code: EPA Method 200.8  Batch ID: 27185 Analysis Date: 08	3/29/2011 20:37
Sample ID: LCS-27185 Analyte	Units: mg/L Run ID: ICP/MS_110829C Prep Date: 08  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal	8/25/2011 15:17 %RPD(Limit) Qual
Chromium (Cr)	0.0507 0.005 0.05 101 85 115	
Sample Matrix Spike File ID: 082911.B\128_S8.D\ Sample ID: 11082501-04AMS	Type MS Test Code: EPA Method 200.8  Batch ID: 27185 Analysis Date: 08  Units: mg/L Run ID: ICP/MS_110829C Prep Date: 08	8/30/2011 14:48 8/25/2011 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	3/29/2011 21:12
Sample ID: 11082501-04AMSD	Units: mg/L Run ID: ICP/MS_110829C Prep Date: 08	3/25/2011 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.



# Alpha Analytical, Inc.

<b>Date:</b> 07-Sep-11	(	QC Summ	ary Report		Work Order: 11082403		
Method Blank		260B					
File ID: 11082506.D			Batch ID: MS15W0825M	Analysis Date: 08/25/2011 10:44			
Sample ID: MBLK MS15W0825M	Units : µg/L		): MSD_15_110825B	Prep Date: 08/25/2011 10:44			
Analyte	Result	PQL Spk	Val SpkRefVal %REC LCL(ME)	UCL(ME) RPDRefVal %RPD(Limit)	Qua		
Dichlorodifluoromethane	ND	0.5					
Chloromethane Vinyl chloride	ND ND	1 0.5					
Chloroethane	ND ND	0.5					
Bromomethane	ND	1					
Trichlorofluoromethane	ND	0.5					
Acetone 1,1-Dichloroethene	ND ND	10					
Dichloromethane	ND ND	0.5 1					
Freon-113	ND	0.5					
trans-1,2-Dichloroethene	ND	0.5					
Methyl tert-butyl ether (MTBE) 1,1-Dichloroethane	ND	0.5					
2-Butanone (MEK)	ND ND	0.5					
cis-1,2-Dichloroethene	ND ND	10 0.5					
Bromochloromethane	ND	0.5					
Chloroform	ND	0.5					
2,2-Dichloropropane	ND	0.5					
1,2-Dichloroethane 1,1,1-Trichloroethane	ND ND	0.5 0.5					
1,1-Dichloropropene	ND	0.5 0.5					
Carbon tetrachloride	ND	0.5					
Benzene	ND	0.5					
Dibromomethane	ND	0.5					
1,2-Dichloropropane Trichloroethene	ND	0.5					
Bromodichloromethane	ND ND	0.5 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 Toluene	ND ND	0.5 0.5					
1,3-Dichloropropane	ND	0.5					
2-Hexanone	ND	5					
Dibromochloromethane	ND	0.5					
1,2-Dibromoethane (EDB) Tetrachloroethene	ND	1					
1,1,1,2-Tetrachioroethane	ND ND	0.5 0.5					
Chlorobenzene	ND	0.5					
Ethylbenzene	ND	0.5					
m,p-Xylene	ND	0.5					
Bromoform Styrene	ND	0.5					
o-Xylene	ND ND	0.5 0.5					
1,1,2,2-Tetrachloroethane	ND	0.5					
1,2,3-Trichloropropane	ND	1					
Isopropylbenzene	ND	0.5					
Bromobenzene n-Propylbenzene	ND ND	0.5 0.5					
4-Chlorotoluene	ND ND	0.5 0.5					
2-Chlorotoluene	ND	0.5					
1,3,5-Trimethylbenzene	ND	0.5					
tert-Butylbenzene	ND	0.5					
1,2,4-Trimethylbenzene sec-Butylbenzene	ND ND	0.5 0.5					
1,3-Dichlorobenzene	ND ND	0.5 0.5					
1,4-Dichlorobenzene	ND	0.5					
4-Isopropyltoluene	ND	0.5					
1,2-Dichlorobenzene	ND	0.5					
n-Butylbenzene 1,2-Dibromo-3-chloropropane (DBCP)	ND ND	0.5					
1,2,4-Trichlorobenzene	ND ND	2.5 1					
Naphthalene	ND	i					
Hexachlorobutadiene	ND	1					
1,2,3-Trichlorobenzene	ND	1		•			



<b>Date:</b> 07-Sep-11	QC	QC Summary Report							
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				



<b>Date:</b> 07-Sep-11	(	QC Summary Report									
Laboratory Control Spike File ID: 11082504.D		Type: LC		est Code: EPA Meti			Date: 00/05/0044 00:45				
Sample ID: LCS MS15W0825M	11-4	_		atch ID: MS15W082	25M	=	Date: 08/25/2011 09:45				
Analyte	Units : µg/L			SD_15_110825B	LOLAME	Prep Dat					
	Result	PQL		-		· · · · · · · ·	DRefVal %RPD(Limit)	Qual			
Dichlorodifluoromethane Chloromethane	8.96	1	10	90	70 70	130					
Vinyl chloride	12 10.1	2	10	120	70 70	130 130					
Chloroethane	12.3	1	10 10	101 123	70 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) 1,1-Dichloroethane	10	0.5	10	100	70 70	130					
2-Butanone (MEK)	9.94 239	1 10	10 200	99 119	70 70	130					
cis-1,2-Dichloroethene	9.94	10	10	99	70 70	130 130					
Bromochloromethane	9.97	1	10	99.7	70 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 Dibromomethane	10.2	0.5	10	102	70	130					
1,2-Dichloropropane	9.96 9.81	1	10	99.6	70 70	130					
Trichloroethene	9.01	1	10 10	98 99.8	70 70	130 130					
Bromodichloromethane	10	1	10	100	70 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 2-Hexanone	9.59	1	10	96	70	130					
Dibromochloromethane	98.7	5	100	99	20	182					
1,2-Dibromoethane (EDB)	8.56 19.5	1 2	10 20	86 97	70 70	130 130					
Tetrachloroethene	19.5	1	10	100	70 70	130					
1,1,1,2-Tetrachloroethane	9.98	i	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 o-Yylene	9.16	1	10	92	70	130					
o-Xylene 1,1,2,2-Tetrachloroethane	10.5	0.5	10	105	70	130					
1,2,3-Trichloropropane	9.05 19	1 2	10	91 05	70 70	130					
Isopropylbenzene	9.88	∠ 1	20 10	95 99	70 70	130 130					
Bromobenzene	9.99	1	10	99.9	70 70	130					
n-Propylbenzene	10.3	i	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 sec-Butylbenzene	10.6	1	10	106	70	130					
1,3-Dichlorobenzene	10.1	1	10	101	70 70	130					
1,4-Dichlorobenzene	10.5 9.65	1	10	105	70 70	130.					
4-Isopropyltoluene	9.65 10.5	1	10 10	97 105	70 70	130 130					
1,2-Dichlorobenzene	9.46	1	10	95	70 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					



<b>Date:</b>	QC	<b>Work Order:</b> 11082403				
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	



Hexachlorobutadiene

1,2,3-Trichlorobenzene

## Alpha Analytical, Inc.

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

Date: Work Order: QC Summary Report 07-Sep-11 Sample Matrix Spike Test Code: EPA Method SW8260B File ID: 11082507.D Batch ID: MS15W0825M Analysis Date: 08/25/2011 11:06 Sample ID: 11082403-04AMS Run ID: MSD\_15\_110825B Units: µg/L Prep Date: 08/25/2011 11:06 Analyte Result **PQL** SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 2.5 Chloromethane 60.5 Vinyl chloride 60.4 2.5 Chloroethane 62.7 2.5 **Bromomethane** Trichlorofluoromethane 60.9 2.5 Acetone 1,1-Dichloroethene 2.5 49.9 99.8 Dichloromethane Freon-113 55.2 2.5 trans-1,2-Dichloroethene 2.5 Methyl tert-butyl ether (MTBE) 53.5 1.3 1,1-Dichloroethane 52.2 2.5 2-Butanone (MEK) cis-1,2-Dichloroethene 52.8 2.5 Bromochloromethane 52.8 2.5 Chloroform 53.3 2.5 2,2-Dichloropropane 54.6 2.5 1,2-Dichloroethane 54.4 2.5 1,1,1-Trichloroethane 54.3 2.5 1,1-Dichloropropene 55.2 2.5 Carbon tetrachloride 2.5 Benzene 53.5 1.3 Dibromomethane 53.4 2.5 1,2-Dichloropropane 51.4 2.5 Trichloroethene 53.7 2.5 1.37 Bromodichloromethane 52.5 2.5 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene 2.5 50.6 trans-1,3-Dichloropropene 46.9 2.5 1,1,2-Trichloroethane 52.7 2.5 Toluene 52.7 1.3 1,3-Dichloropropane 50.2 2.5 2-Hexanone Dibromochloromethane 44.6 2.5 1.2-Dibromoethane (EDB) Tetrachloroethene 53.4 2.5 1,1,1,2-Tetrachloroethane 52.4 2.5 Chlorobenzene 2.5 Ethylbenzene 55.6 1.3 m,p-Xylene 54.5 1.3 **Bromoform** 44.4 2.5 Styrene 47.6 2.5 o-Xylene 54.5 1.3 1,1,2,2-Tetrachloroethane 2.5 1,2,3-Trichloropropane Isopropylbenzene 51.1 2.5 Bromobenzene 51.9 2.5 n-Propylbenzene 52.8 2.5 4-Chlorotoluene 50.7 2.5 2-Chlorotoluene 50.3 2.5 1,3,5-Trimethylbenzene 53.9 2.5 tert-Butylbenzene 52.5 2.5 1,2,4-Trimethylbenzene 2.5 sec-Butvlbenzene 52.1 2.5 1,3-Dichlorobenzene 54.4 2.5 1,4-Dichlorobenzene 49.9 2.5 n 99.9 4-Isopropyltoluene 54.2 2.5 1,2-Dichlorobenzene 48.7 2.5 n-Butvibenzene 56.1 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene 50.8 Naphthalene 46.7 

51.1

0 102



<b>Date:</b> 07-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11082403
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: Work Order: QC Summary Report 07-Sep-11 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 86 21 138 45.95 6.6(33)Chloromethane 54.1 10 50 23 60.47 0 108 144 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 0 10 50 82 174 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 0 92 130 49.89 50 64 7.8(21)Dichloromethane 46 10 50 0 92 69 130 49.02 6.4(20)Freon-113 51.6 2.5 0 50 103 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 54.38 50 0 105 65 134 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 8.0(21) 50 0 99 59 138 53.53 Dibromomethane 51.5 2.5 50 53.35 0 103 70 130 3.6(20)1,2-Dichloropropane 47.9 2.5 50 0 96 70 51.35 7.0(20)131 Trichloroethene 49.7 2.5 50 97 65 53.66 7.7(20)1.37 144 Bromodichloromethane 49.7 2.5 50 50 0 99 157 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 O 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 44.64 50 0 87 42 155 2.2(20)1,2-Dibromoethane (EDB) 99.5 5 100 0 70 130 101.7 2.3(20) 99 Tetrachloroethene 49.3 2.5 50 53.43 8.0(20) 0 99 65 130 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 50 102 68 55.64 8.3(20) 130 m,p-Xylene 50.5 1.3 50 68 54.52 O 101 131 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 n 101 70 54.53 7.8(20) 130 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 9.7(20) 50.65 2-Chlorotoluene 45.1 2.5 50 70 90 130 50.25 10.9(20) 1,3,5-Trimethylbenzene 47 6 2.5 50 n 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 68 Λ 93 135 52.07 11.1(20) 1,3-Dichlorobenzene 49.2 2.5 50 O 98 70 130 54.36 10.0(20) 1,4-Dichlorobenzene 45.2 49.94 2.5 90 70 50 0 130 9.9(20)4-Isopropyltoluene 48.2 2.5 50 96 68 132 54.23 11.7(20) 0 1,2-Dichlorobenzene 44.8 2.5 50 90 70 130 48.65 8.3(20) 0 n-Butvlbenzene 50.1 2.5 50 100 62 56.12 n 134 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 98 32 46.72 5.0(40) 50 0 166 Hexachlorobutadiene 108 10 100 108 63 130 115.2 6.1(21)0 1,2,3-Trichlorobenzene 53.5 10 50 55 138 51.06 4.7(36)

107



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<b>Date:</b>	QC	Summary Re	port			<b>Work Order:</b> 11082403
Surr: 1,2-Dichloroethane-d4 Surr: Toluene-d8	54.1 48.6	50 50	108 97	70 70	130 130	
Surr: 4-Bromofluorobenzene	46.3	50	93	70	130	

#### **Comments:**

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

# Billing Information:

# CHAIN-OF-CUSTODY RECORD

# Alpha Analytical, Inc.

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

Report Due By: 5:00 PM On: 08-Sep-2011

WorkOrder: BMIS11082403

Page: 1 of 1

Report AttentionPhone NumberEMail AddressDavid Conner(619) 726-7311 xconnerd@battelle.orgBetsy Cutie(614) 424-4899 xcutiee@batelle.org

Battelle Memorial Institute

655 West Broadway

San Diego, CA 92101

Shane Walton

(614) 424-4117 x

waltons@battelle.org

EDD Required : Yes

Sampled by: Chase Brogdon, D Loera

Cooler Temp Samples Received Date Printed
4 °C 24-Aug-2011 24-Aug-2011

QC Level: DS4 Client's COC #: 024300, 25565 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates Job: 100006114/JPL Groundwater Monitoring

BMI11082403-10A MW-7 BMI11082403-08A TB-01-8/23/11 BMI11082403-07A EB-01-8/23/11 BMI11082403-06A BMI11082403-03A MW-19-3 BMI11082403-09A SB-01-8/23/11 BMI11082403-05A MW-19-1 BMI11082403-04A BMI11082403-02A MW-19-4 BMI11082403-01A DUPE-01-3Q11 MW-19-2 MW-19-5 Sample ID å Š å å å å Š Š Š å 08/23/11 07:00 08/23/11 09:29 08/23/11 10:35 08/23/11 11:20 08/23/11 00:00 08/23/11 11:29 08/23/11 10:21 08/23/11 09:58 08/23/11 10:52 Collection No. of Bottles 08/23/11 11:36 Alpha Sub G Ŋ 4 4 4 ω 4 4 0 0 0 0 0 0 0 0 0 C TAT 10 6 6 5 6 6 6 5 6 6 NO2, NO3, Perchlorate PO4, CI, SO4 300\_0\_W Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ ζ. ζ VOC by 524 VOC by 524 Criteria Criteria VOC by 524 Criteria Criteria VOC by 524 Requested Tests VOC by 524 Criteria VOC\_W RENO TRIP BLANK 4/6/11 Logged in sample time per sample containers. Sample Remarks MS/MSD

Comments: conversation with David Conner, confirmed job number. : 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 Elizabeths phone

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

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

			)	
g Information:		Alpha Analytical, Inc.  Samples Coll	ected From Which State?	5565
Name SWINGHO BENHED TOWN Address SQS ILING AHE	Sparks, Nevac	[ [	OTHER	of
le, Zip Columbus, C	Phone (775) 355-1044 Fax (775) 355-0406	355-1044 5-0406	Analyses Required	
	P.O. # 2022 / Job #		( S)	I ava
$\setminus$	EMail Address	24.	<i>-</i>	/ ₹
3990 OID TOWN AVE. CZE	5 CONNECT @ BATT	1/E. ORG	#e	=
City, State, Zip DIEGO CA 921/0	6-7311 Fax	1614) US8-6614 / T	C SR       EDD/EDF? YES	NO
Date	GONNER	2 ) (S	(Global ID #	
d Sampled Below	Ď	to	/ / REMARKS	
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0957 - 02A	mw - 19 - 4	X Southern X		
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ADDITIONAL INSTRUCTIONS:				
Signature	Print Name	Company	Date Ti	Time
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Received by	Anthon Stall	Apple thatie	2 8/13/11 153	0
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Received by and Interples	Sara Coffee	11	8/24/11 11:3	36
Helinquished by				
Received by				

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.

\*Key: AQ - Aqueous

SO - Soil

WA - Waste

OT - Other

AR - Air

\*\*: L-Liter

V-Voa

S-Soil Jar

0-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

*Key: AQ - Aqueous SO - Soil WA - Waste	Received by Janos In Calla	Relinquished by	Received by	Relinquished by	Received by	Relinquished by	Signature	ADDITIONAL INSTRUCTIONS: * Chloride, Witrate, Witrite, Or					ACI.	A Page 12 Mailines (Use	Sampled by U Loe	City, State, Zip	,	Client Name ) And (Anno C	City, State, Zip Columbos OH 4320 Phone Number 619 726-7311 Fax 614 45	Billing Information:  Name Sattelle Address SOS Kins Ave.
ste OT - Other AR - Air **: L-Liter	Sava Coffice	., 0 .,	Anthon, Stall	Clifts E Businer	CHESE BUILDA	David Loor	Print Name	ocide, Nitrate, Nitrite, Orthophosphate, Sult					7.07	Campia Description	David Conner	L~2)	connerd (a) battelle .	72/5   Job#	8-66HI Fax (775) 355-0406	Alpha Analytical, Inc. 255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
V-Voa S-Soil Jar O-Orbo T-Tedlar	11 11		the Arabitical	Tustes	THEOLOGY	Battelle	Company	ate, Sulfate						Filtered "See Delow X X	Total and type of containers	H28-1941 A A	24.2	8)	06 Analyses Required	Samples Collected AZ CA ID OR
B-Brass P-Plastic OT-Other	8/24/11 11:37	8/23/11 1530	8/23/1, 1570	8/21/11 1520	8/23/11 1200	8-23-11 1200	Date Time							HEMARKS	Global ID #	EDD / EDF? YES NO	/		Required	NV WA Page # 0 2 \$ 3 0

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.

\*Key: AQ - Aqueous

WA - Waste

OT - Other

AR - Air

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

\*\*: L-Liter V-Voa

S-Soil Jar

0-Orbo

T-Tedlar

B-Brass

P-Plastic



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:

BMI11082501

Cooler Temp:

3°C

DIMITIO02301	~	ooler remp.	
Alpha's Sample ID	Client's Sample ID	Matrix	
11082501-01A	MW-14-5	Aqueous	12/14
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	Integr	ated	Analyte	S
				_

	Transactive Times	100	
 Alpha's Sample ID	Test Reference	<u>Analyte</u>	
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/Chainof-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



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: 08/25/11

Job:

100006114/JPL Groundwater Monitoring

Anions by IC

EPA Method 300.0

Client ID: MW-8	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
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 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 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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Report Date

100006114/JPL Groundwater Monitoring



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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: BMI11082501-01A Date Sampled 08/24/11 09:14	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/26/11 22:23
Client ID: <b>MW-14-4</b> Lab ID: BMI11082501-02A Date Sampled 08/24/11 09:39	Perchlorate	3.94	1.00 µg/L	08/26/11 11:27	08/26/11 22:41
Client ID: MW-14-3 Lab ID: BMI11082501-03A Date Sampled 08/24/11 10:02	Perchlorate	4.42	1.00 µg/L	08/26/11 11:27	08/26/11 23:00
Client ID: MW-14-2 Lab ID: BMI11082501-04A Date Sampled 08/24/11 10:23	Perchlorate	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: BMI11082501-05A Date Sampled 08/24/11 10:54	Perchlorate	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: BMI11082501-06A Date Sampled 08/24/11 00:00	Perchlorate	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: BMI11082501-07A Date Sampled 08/24/11 10:40	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/27/11 00:13
Client ID: MW-8 Lab ID: BMII1082501-09A Date Sampled 08/24/11 10:45	Perchlorate	ND .	1.00 μg/L	08/26/11 11:27	08/27/11 00:32

ND = Not Detected

Roger Scholl Kandy Saulner

Walter Strikm

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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#### **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: MW-14-3 Lab ID: BMI11082501-03A Date Sampled 08/24/11 10:02	Chromium (Cr)	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:24
Client ID: MW-14-2 Lab ID: BMI11082501-04A Date Sampled 08/24/11 10:23	Chromium (Cr)	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:01
Client ID: MW-14-1 Lab ID: BMI11082501-05A Date Sampled 08/24/11 10:54	Chromium (Cr)	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:30
Client ID: <b>DUPE-02-3Q11</b> Lab ID: BMI11082501-06A Date Sampled 08/24/11 00:00	Chromium (Cr)	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: BMI11082501-07A Date Sampled 08/24/11 10:40	Chromium (Cr)	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:42
Client ID: MW-8  Lab ID: BMI11082501-09A  Date Sampled 08/24/11 10:45	Chromium (Cr)	ND	0.0050 mg/L	08/25/11 15:17	08/29/11 21:48

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

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

			Estimated		
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID: MW-14-5  Lab ID: BMII 1082501-01A  Date Received: 08/25/11  Date Sampled: 08/24/11 09:14	* * * None Found * * *	ND	2.0 μg/L	08/26/11 14:07	08/26/11 14:07
Client ID: MW-14-4 Lab ID: BMI11082501-02A Date Received: 08/25/11 Date Sampled: 08/24/11 09:39	* * * None Found * * *	ND	2.0 μg/L	08/26/11 14:28	08/26/11 14:28
Client ID: MW-14-3 Lab ID: BMI11082501-03A Date Received: 08/25/11 Date Sampled: 08/24/11 10:02	* * * None Found * * *	ND	2.0 μg/L	08/26/11 14:50	08/26/11 14:50
Client ID: MW-14-2 Lab ID: BMI11082501-04A Date Received: 08/25/11 Date Sampled: 08/24/11 10:23	* * * None Found * * *	ND	2.0 μg/L	08/26/11 15:11	08/26/11 15:11
Client ID: MW-14-1  Lab ID: BM111082501-05A  Date Received: 08/25/11  Date Sampled: 08/24/11 10:54	*** None Found ***	ND	2.0 μg/L	08/26/11 15:33	08/26/11 15:33
Client ID : <b>DUPE-02-3Q11</b> Lab ID : BMI11082501-06A  Date Received : 08/25/11  Date Sampled : 08/24/11 00:00	* * * None Found * * *	ND	2.0 μg/L	08/26/11 15:54	08/26/11 15:54
Client ID: EB-02-08/24/11 Lab ID: BMI11082501-07A Date Received: 08/25/11 Date Sampled: 08/24/11 10:40	*** None Found ***	ND	2.0 μg/L	08/26/11 13:45	08/26/11 13:45
Client ID: TB-02-8/24/11 Lab ID: BMI11082501-08A Date Received: 08/25/11 Date Sampled: 08/24/11 07:20	*** None Found ***	ND	2.0 μg/L	08/26/11 13:23	08/26/11 13:23
Client ID: MW-8  Lab ID: BMI11082501-09A  Date Received: 08/25/11  Date Sampled: 08/24/11 10:45	*** None Found ***	ND	2.0 μg/L	08/26/11 16:16	08/26/11 16:16



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Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Kan

Walter Hindrey

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@aipha-analytical.com

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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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-01A

Client I.D. Number: MW-14-5

Attn: David Conner

(619) 726-7311 Phone: Fax:

(614) 458-6641

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 L	imit
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-Tetrachioroethane	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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachioroethene

Roger Scholl

ΝD

ND

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1.0

μg/L

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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

Alpha Analytical Number: BMI11082501-02A

Client I.D. Number: MW-14-4

David Conner Attn: Phone: (619) 726-7311

(614) 458-6641 Fax:

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 Li	mit
1	Dichlorodifluoromethane	ND	0.50	μg/L	36	1,1,1,2-Tetrachioroethane	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 <sub>.</sub>	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 (DBC		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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34

33 Dibromochloromethane

Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

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

μg/L

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

**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.



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#### ANALYTICAL REPORT

**Battelle Memorial Institute** 

655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-03A

Client I.D. Number: MW-14-3

**David Conner** Attn:

Phone: (619) 726-7311

Fax:

(614) 458-6641

Sampled: 08/24/11 10:02

Received: 08/25/11

Extracted: 08/26/11 14:50 Analyzed: 08/26/11 14:50

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

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting Li	imit
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 (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl

ND

0.76

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1.0

μg/L

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



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#### ANALYTICAL REPORT

**Battelle Memorial Institute** 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-04A

Client I.D. Number: MW-14-2

Attn: **David Conner** 

Phone: (619) 726-7311 Fax:

(614) 458-6641

Sampled: 08/24/11 10:23

Received: 08/25/11

Extracted: 08/26/11 15:11 Analyzed: 08/26/11 15:11

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

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting Li	imit
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-Xvlene	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	Chioroform	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 (DBC	P) ND	2.5	μg/L
25	Trichloroethene	5.7	0.50	μg/L	60	1,2,4-Trichlorobenzene	ND	1.0	μg/L
26	Bromodichioromethane	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

33 Dibromochloromethane

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

ND

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μg/L

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



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-05A

Client I.D. Number: MW-14-1

David Conner Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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-chioropropane (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

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1.0

μg/L

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** 



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-06A

Client I.D. Number: DUPE-02-3Q11

Attn: David Conner

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

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 L	imit
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-Xvlene	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-Propvlbenzene	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 (DBC)	P) 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			1	(. 1 100)	
33	Dibromochloromethane	ND	0.50	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Saulmer

ND

ND

Dalter Airihner

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

μg/L

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
Page 1 of 1



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-07A

Client I.D. Number: EB-02-08/24/11

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 Li	imit
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 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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soulman

ND

ND

Walter Atrihon

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

1.0

μg/L

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



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-08A

Client I.D. Number: TB-02-8/24/11

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Xvlene	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 (DBC)	P) 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			1	, , , , , , ,	
33	Dibromochloromethane	ND	0.50	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Santon

ND

Walter Hirihow

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

1.0

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.

Report Date



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082501-09A

Client I.D. Number: MW-8

Attn: **David Conner** 

Phone: (619) 726-7311

Fax: (614) 458-6641

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 Li	imit
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 (DBCI	P) 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					
24	1.0 Diberre others (EDD)			. •					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl

ND

ND

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

1.0

μg/L

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



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# **VOC Sample Preservation Report**

Work Order: BMI11082501

Job:

100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН	
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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<b>Date:</b> 30-Aug-11	C	)C Su	ımmar	y Repor	t				Work Orde 11082501	
Method Blank File ID: 20 Sample ID: MB-27184	Units : mg/L		Ba Run ID: <b>IC</b>	est Code: <b>EF</b> atch ID: <b>2718</b> _1_110825A	34		Prep Dat	te: (	08/25/2011 15:14 08/25/2011 14:18	
Analyte  Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	Result  ND  ND  ND  ND  ND  ND  ND	0.5 0.25 0.25 0.5 0.5	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RF	PDRefVa	al %RPD(Limit)	_Qual
Laboratory Fortified Blank		Type: <b>LF</b>		est Code: <b>EF</b>		hod 300.0				
File ID: 21	A Ladda a san an			atch ID: 2718			-		08/25/2011 15:33	
Sample ID: LFB-27184 Analyte	Units : <b>mg/L</b> Result	PQL		_1_110825A		LCL/ME)	Prep Dat		08/25/2011 14:18 al %RPD(Limit)	Qual
Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	49.2 5 5.25 5.5 101	0.5 0.25 0.25 0.5 0.5	50 5 5 5 5 100	Operation	98 100 105 110 101	90 90 90 90 90 90	110 110 110 110 110 110	Ditterve	a wit b(climy	
Sample Matrix Spike		Type: <b>LF</b>	<b>M</b> Te	est Code: EF	A Met	hod 300.0				
File ID: 24			Ва	atch ID: 2718	34		Analysis	Date: (	08/25/2011 16:28	
Sample ID: 11082501-09ALFM Analyte	Units : <b>mg/L</b> Result	PQL	•	_1_110825A SpkRefVal		LCL(ME)	Prep Dat		08/25/2011 14:18 al %RPD(Limit)	Qual
Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	56.2 4.94 5.86 5.69 110	0.5 0.25 0.25 0.5 0.5	50 5 5 5 100	6.122 0 0.8345 0 17.87	100 99 101 114 92	80 80 80 80 80	120 120 120 120 120 120			
Sample Matrix Spike Duplicate		Type: <b>LF</b>	MD T	est Code: EF	A Met	hod 300.0				
File ID: 25				atch ID: 2718			-		08/25/2011 16:47	
Sample ID: 11082501-09ALFMD	Units : mg/L			_1_110825A			Prep Dat		08/25/2011 14:18	
Analyte  Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	757 5.08 5.98 6.1	90.5 0.25 0.25 0.5 0.5	50 5 5 5 5 100	6.122 0 0.8345 0 17.87	93 98 98 93 93	80 80 80 80 80 80	120 120 120 120 120 120	56.24 4.944 5.863 5.693 109.7	1.4(15) 2.8(15) 2.0(15) 7.0(15) 1.4(15)	Quai M1

#### 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.



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<b>Date:</b> 06-Sep-11		C	QC S	umma	ry Repor	t			<b>Work Orde</b> 11082501	
Method Bla File ID: 14	nk		Type: N		Test Code: El Batch ID: <b>271</b>	94	hod 314.0	•	08/26/2011 12:24	
Sample ID:	MB-27194	Units : µg/L			C_3_110826I			Prep Date:	08/26/2011 11:27	
Analyte		Result	PQL	SpkVa	I SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		ND		1					<del></del>	
Laboratory File ID: 15	Fortified Blank		Туре: <b>L</b>		Test Code: <b>E</b> Batch ID: <b>271</b>		thod 314.0	Analysis Date:	08/26/2011 12:42	
Sample ID:	LFB-27194	Units : µg/L	•	Run ID: I	C_3_110826I	3		Prep Date:	08/26/2011 11:27	
Analyte		Result	PQL	SpkVa	ıl SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		23.5	2	2 2	5	94	85	115		
Sample Mat	trix Spike		Туре: <b>L</b>	-	Test Code: E Batch ID: 271		thod 314.0	Analysis Date:	08/26/2011 14:14	
Sample ID:	11082601-02ALFM	Units : μg/L		Run ID: I	C_3_110826	В		Prep Date:	08/26/2011 11:27	
Analyte		Result	PQL	SpkVa	ıl SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		31.4		2 2	5 6.62	99	80	120		
Sample Mat	trix Spike Duplicate		Туре: <b>L</b>	-FMD	Test Code: E	PA Me	thod 314.0			
File ID: <b>21</b>	•				Batch ID: <b>271</b>	94		Analysis Date:	08/26/2011 14:33	
Sample ID:	11082601-02ALFMD	Units : µg/L		Run ID: I	C_3_110826	В		Prep Date:	08/26/2011 11:27	
Analyte		Result	PQL	SpkVa	al SpkRefVal	%REC	C LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		29.9	-	2 2	5 6.62	93	80	120 31.4	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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<b>Date:</b> 08-Sep-11	(	QC S	ummar	y Repoi	:t				<b>Work Ord</b> 1108250	
Method Blank File ID: 082911.B\071_M,D\ Sample ID: MB-27185	Units : <b>mg/L</b>	Type N	В	est Code: E atch ID: 271 CP/MS_1108	85	thod 200.8	Analys Prep D		08/29/2011 20:31 08/25/2011 15:17	
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	C LCL(ME)	UCL(ME)	RPDRef\	Val %RPD(Limit)	Qual
Chromium (Cr)	ND	0.005	5							
Laboratory Control Spike File ID: 082911.B\072_M.D\		Type L		est Code: E		thod 200.8	Analys	sis Date:	08/29/2011 20:37	
Sample ID: LCS-27185	Units : mg/L		Run ID: IC	P/MS_1108	29C		Prep D	Date:	08/25/2011 15:17	
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	C LCL(ME)	UCL(ME) I	RPDRef\	Val %RPD(Limit)	Qual
Chromium (Cr)	0.0507	0.005	5 0.05		101	85	115			
Sample Matrix Spike File ID: 082911.B\128_S8.D\		Type N		est Code: E		thod 200.8	Analys	is Date:	08/30/2011 14:48	
Sample ID: 11082501-04AMS	Units : mg/L		Run ID: IC	P/MS_1108	29C		Prep D	ate:	08/25/2011 15:17	
Analyte	Result	PQL		_		C LCL(ME)	UCL(ME)	RPDRef\	√al %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 N		est Code: E		thod 200.8	Analys	is Date:	08/29/2011 21:12	
Sample ID: 11082501-04AMSD	Units : mg/L			P/MS 1108			Prep D		08/25/2011 15:17	
Analyte	Result	PQL		_		LCL(ME)	•		Val %RPD(Limit)	Qual
Chromium (Cr)	0.0395	0.005			<del></del>	70	130	0.048		

#### 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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<b>Date:</b> 08-Sep-11	(	QC Sum	mary Report		<b>Work Order:</b> 11082501
Method Blank		Type: MBL	Test Code: EPA Method		
File ID: 11082606.D			Batch ID: MS15W0826M	Analysis Dat	e: <b>08/26/2011 11:14</b>
Sample ID: MBLK MS15W0826M	Units : µg/L	Run	ID: MSD_15_110826B	Prep Date:	08/26/2011 11:14
Analyte	Result		pkVal SpkRefVal %REC LC	L(ME) UCL(ME) RPDR	efVal %RPD(Limit) Qเ
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 Dichloromethane	ND ND	0.5 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 Bromochloromethane	ND ND	0.5 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 Carbon tetrachloride	ND ND	0.5			
Benzene	ND ND	0.5 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 trans-1,3-Dichloropropene	ND ND	0.5 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 1,1,1,2-Tetrachloroethane	ND ND	0.5 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 1,1,2,2-Tetrachloroethane	ND ND	0.5 0.5			
1,2,3-Trichloropropane	ND ND	0.5			
Isopropylbenzene	ND	0.5			
Bromobenzene	ND	0.5			
n-Propylbenzene	ND	0.5			
4-Chlorotoluene	ND	0.5			
2-Chlorotoluene 1,3,5-Trimethylbenzene	ND ND	0.5 0.5			
tert-Butylbenzene	ND	0.5 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 1,2-Dichlorobenzene	ND ND	0.5 0.5			
n-Butylbenzene	ND 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 10.5	1	10 105	70 130	
Surr: 1,2-Dichloroethane-d4 Surr: Toluene-d8	10.5 9.8		10 105 10 98	70 130	



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<b>Date:</b> 08-Sep-11	QC	Summary Rep	ort			<b>Work Order:</b> 11082501
Surr: 4-Bromofluorobenzene	9.12	10	91	70	130	



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Work Order:

Date: OC Summary Report 08-Sep-11 Test Code: EPA Method SW8260B Type: LCS Laboratory Control Spike Analysis Date: 08/26/2011 10:21 Batch ID: MS15W0826M File ID: 11082604.D Prep Date: 08/26/2011 10:21 Units: µg/L Run ID: MSD\_15\_110826B LCS MS15W0826M Sample ID: SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual PQL Result Analyte Dichlorodifluoromethane 9.15 Chloromethane 12.1 Vinvl chloride Chloroethane 9.28 Bromomethane 12.2 Trichlorofluoromethane 10.1 1,1-Dichloroethene 9.84 Dichloromethane 11.2 Freon-113 10.6 trans-1.2-Dichloroethene 0.5 Methyl tert-butyl ether (MTBE) 10.4 10.5 1,1-Dichloroethane 2-Butanone (MEK) 10.6 cis-1,2-Dichloroethene 10.4 Bromochloromethane 10.8 Chloroform 10.9 2,2-Dichloropropane 1,2-Dichloroethane 10.8 1.1.1-Trichloroethane 1,1-Dichloropropene 11.3 10.7 Carbon tetrachloride 10.8 0.5 Benzene Dibromomethane 10.4 10.4 1.2-Dichloropropane 10.7 Trichloroethene Bromodichloromethane 10.5 2.5 4-Methyl-2-pentanone (MIBK) 26.8 10.3 cis-1,3-Dichloropropene trans-1,3-Dichloropropene 9.41 10.3 1,1,2-Trichloroethane 10.7 0.5 Toluene 1.3-Dichloropropane 8.95 Dibromochloromethane 1,2-Dibromoethane (EDB) 20.2 10.6 Tetrachloroethene 10.4 1,1,1,2-Tetrachloroethane 10.3 Chlorobenzene 0.5 11.3 Ethylbenzene 0.5 m,p-Xylene 11.2 8.67 **Bromoform** Styrene 9.56 0.5 11.1 o-Xylene 1,1,2,2-Tetrachloroethane 9.33 19.8 1,2,3-Trichloropropane 10.5 Isopropylbenzene 10.5 Bromobenzene 10.8 n-Propylbenzene 10.4 4-Chlorotoluene 2-Chlorotoluene 10.3 1.3.5-Trimethylbenzene 10.7 tert-Butylbenzene 11.1 1,2,4-Trimethylbenzene 10.6 sec-Butylbenzene 1.3-Dichlorobenzene 10.1 1,4-Dichlorobenzene 11.1 4-Isopropyltoluene 1.2-Dichlorobenzene 9.87 n-Butylbenzene 11.4 1,2-Dibromo-3-chloropropane (DBCP) 47.4 9.64 1.2.4-Trichlorobenzene Naphthalene 8.35 Hexachlorobutadiene 22.5 9.26 1,2,3-Trichlorobenzene Surr: 1,2-Dichloroethane-d4 10.2 Surr: Toluene-d8 9.71



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Date: 08-Sep-11	QC	Summary Rep	port			<b>Work Order:</b> 11082501
Surr: 4-Bromofluorobenzene	9.49	10	95	70	130	



Date:

# Alpha Analytical, Inc.

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OC Summary Report

Work Order:

08-Sep-11 Test Code: EPA Method SW8260B Type: MS Sample Matrix Spike Analysis Date: 08/26/2011 11:36 Batch ID: MS15W0826M File ID: 11082607.D 08/26/2011 11:36 Prep Date: Run ID: MSD\_15\_110826B Units: µg/L Sample ID: 11082501-04AMS SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual **PQL** Result Analyte 2.5 41.6 Dichlorodifluoromethane 54.5 Chloromethane 51.4 2.5 Vinyl chloride 2.5 Chloroethane 53.5 40.1 **Bromomethane** n 2.5 55.2 Trichlorofluoromethane 2.5 45.3 1.1-Dichloroethene 44.8 Dichloromethane 50.8 2.5 Freon-113 2.5 47.3 trans-1,2-Dichloroethene 48.9 1.3 Methyl tert-butyl ether (MTBE) 2.5 47.1 1.1-Dichloroethane 2-Butanone (MEK) cis-1,2-Dichloroethene 2.5 47.7 48.1 2.5 Bromochloromethane 48.8 2.5 0.52 Chloroform 47.8 2.5 2.2-Dichloropropane 99.6 2.5 1.2-Dichloroethane 49.8 2.5 1,1,1-Trichloroethane 50.3 2.5 1,1-Dichloropropene 2.5 Carbon tetrachloride 47.9 48.1 1.3 Benzene 2.5 48.8 Dibromomethane 46.1 2.5 1,2-Dichloropropane 5.66 2.5 Trichloroethene 2.5 47.9 Bromodichloromethane 4-Methyl-2-pentanone (MIBK) 2.5 45.3 cis-1,3-Dichloropropene 2.5 trans-1,3-Dichloropropene 42.7 48.8 2.5 1,1,2-Trichloroethane 47.5 1.3 Toluene 46 7 2.5 1,3-Dichloropropane 41.4 2.5 Dibromochloromethane 94.5 1.2-Dibromoethane (EDB) 2.5 48.5 Tetrachloroethene 47.5 2.5 1,1,1,2-Tetrachloroethane 2.5 Chlorobenzene 46.4 50.6 1.3 Ethylbenzene 49.5 1.3 m,p-Xylene 2.5 **Bromoform** 2.5 43.1 Styrene 99.6 49.8 1.3 o-Xylene 2.5 1,1,2,2-Tetrachloroethane 44.5 1,2,3-Trichloropropane Isopropylbenzene 46.2 2.5 2.5 Bromobenzene 47.1 47.7 2.5 n-Propylbenzene 45.9 2.5 4-Chlorotoluene 2.5 2-Chlorotoluene 45.7 48.7 2.5 1,3,5-Trimethylbenzene 47.4 2.5 tert-Butylbenzene 48.8 2.5 1,2,4-Trimethylbenzene 47.1 2.5 sec-Butylbenzene 2.5 1.3-Dichlorobenzene 45.4 2.5 1,4-Dichlorobenzene 49.1 2.5 4-Isopropyltoluene 2.5 1,2-Dichlorobenzene 44.4 50.6 2.5 n-Butylbenzene 1,2-Dibromo-3-chloropropane (DBCP) 45.6 1,2,4-Trichlorobenzene O 42.6 Nanhthalene Hexachlorobutadiene 48.1 1,2,3-Trichlorobenzene Surr: 1,2-Dichloroethane-d4 52.8 48.1 Surr: Toluene-d8



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<b>Date:</b> 08-Sep-11		Summary Rep	port			<b>Work Order:</b> 11082501
Surr: 4-Bromofluorobenzene	46.7	50	93	70	130	



Date:

# Alpha Analytical, Inc.

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Work Order:

QC Summary Report 11082501 08-Sep-11 Test Code: EPA Method SW8260B Type: MSD Sample Matrix Spike Duplicate Analysis Date: 08/26/2011 11:57 Batch ID: MS15W0826M File ID: 11082608.D Prep Date: 08/26/2011 11:57 Sample ID: 11082501-04AMSD Units: µg/L Run ID: MSD\_15\_110826B PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Analyte Result 41.6 2.0(33)85 138 Dichlorodifluoromethane 42.4 2.5 21 107 144 54.5 2.1(27)10 50 23 Chloromethane 53.4 1.6(21) 136 51.43 2.5 50 O 105 49 Vinyl chloride 52.3 3.7(40)21 159 53.47 50 n 111 Chloroethane 55.5 2.5 10 174 40.09 2.7(40) 10 50 0 82 Bromomethane 412 1.5(37)2.5 55.19 Trichlorofluoromethane 56 50 0 112 32 154 130 45.28 2.4(21)93 64 46.4 50 0 1,1-Dichloroethene 2.5 Dichloromethane 10 50 0 92 69 130 44.76 2.7(20)46 50.78 2.9(40)Freon-113 52.3 2.5 50 0 105 55 141 63 130 47.31 2.4(20) trans-1,2-Dichloroethene 48.5 2.5 50 0 97 48.89 6.9(40)Methyl tert-butyl ether (MTBE) 50 0 105 47 150 52.4 1.3 47.09 3.4(20)1,1-Dichloroethane 2.5 50 0 97 66 130 48.7 6.7(22)182 869.5 2-Butanone (MEK) 930 50 1000 O 93 23 130 47.72 3.5(20)cis-1,2-Dichloroethene 49.4 2.5 50 0 99 4.1(20) 48.1 Bromochloromethane 50.1 2.5 50 0 100 70 132 101 70 130 48.75 4.1(20)50.8 2.5 50 Chloroform 52 99.8 38 154 47.81 4.3(22)2,2-Dichloropropane 49.9 2.5 50 O 49.78 4.6(20)65 134 1,2-Dichloroethane 52.1 2.5 50 0 104 0 101 65 136 49 3.3(20)1.1.1-Trichloroethane 50.6 2.5 50 50.25 0 103 68 132 2.3(20)1,1-Dichloropropene 51.4 2.5 50 47.87 3.0(20)148 Carbon tetrachloride 49.3 2.5 50 0 99 58 48.14 3.0(21)49.6 1.3 50 0 99 59 138 Benzene 4.9(20)48.8 Dibromomethane 2.5 0 103 70 130 51.3 50 0 97 70 131 46.1 4.6(20)1,2-Dichloropropane 48.3 2.5 50 53.96 2.3(20)2.5 50 5.66 99 65 144 Trichloroethene 55.2 157 47.85 4.5(20)Bromodichloromethane 0 100 50 50 2.5 50 20 182 127.2 6.3(20)108 4-Methyl-2-pentanone (MIBK) 135 13 125 0 63 131 45.3 3.9(20)cis-1.3-Dichloropropene 47.1 2.5 50 0 94 4.8(20)42.65 trans-1,3-Dichloropropene 44.8 2.5 50 0 90 65 136 48.79 4.2(20)0 102 70 131 1,1,2-Trichloroethane 50.9 2.5 50 2.4(20) 47.49 48.6 1.3 50 0 97 68 130 97 130 46.66 4.3(20)0 70 1,3-Dichloropropane 48.7 2.5 50 Dibromochloromethane 0 87 42 155 41.44 4.4(20)43.3 2.5 50 3.7(20) 94.53 70 130 1,2-Dibromoethane (EDB) 100 0 98 98.1 5 2.5 0 99 65 130 48.46 1.7(20)Tetrachloroethene 49.3 50 1.1.1.2-Tetrachloroethane 2.5 50 0 98 70 130 47.53 3.1(20)49 2.3(20)46.38 Chlorobenzene 47.5 50 0 95 70 130 2.5 68 130 50.58 1.7(20)Ethylbenzene 50 0 103 51.5 1.3 68 49.53 1.2(20)m,p-Xylene 50.2 1.3 50 0 100 131 4.9(20)**Bromoform** 50 0 86 65 143 41.03 43.1 2.5 153 43.12 2.1(37)0 88 59 Styrene 44.1 2.5 50 49.79 1.6(20)o-Xylene 50.6 1.3 0 101 70 130 50 5.7(20) 44.53 0 130 1,1,2,2-Tetrachloroethane 47.1 2.5 50 94 67 5.4(20)0 100 70 130 94.98 1,2,3-Trichloropropane 10 100 100 46.15 0.9(20)Isopropylbenzene 46.6 2.5 50 0 93 55 138 47.05 2.5(20)96 70 130 0 Bromobenzene 48.2 2.5 50 2.5 133 47.74 0.3(30)n-Propylbenzene 47 9 50 0 96 67 0 93 70 130 45.91 1.6(20)4-Chlorotoluene 46.7 2.5 50 0 92 70 130 45.71 0.1(20)2-Chlorotoluene 45.8 2.5 50 48.67 1.2(21)1,3,5-Trimethylbenzene 49.2 50 0 98 67 134 2.5 47.44 1.2(20) 0 96 55 147 tert-Butylbenzene 48 50 98 65 135 48.78 0.6(25)1.2.4-Trimethylbenzene 49.1 2.5 50 0 47.14 1.1(20)sec-Butvlbenzene 0 95 68 135 477 2.5 50 1,3-Dichlorobenzene 0 99.8 70 130 49.03 1.8(20)49.9 2.5 50 0 130 45.38 1.8(20)70 1,4-Dichlorobenzene 50 92 46.2 2.5 4-Isopropyltoluene 49.7 2.5 50 0 99 68 132 49.14 1.1(20)44.43 3.6(20)0 70 130 1,2-Dichlorobenzene 46.1 2.5 50 92 0 102 134 50.63 0.9(21)62 n-Butvlbenzene 2.5 50 51.1 6.9(20)1,2-Dibromo-3-chloropropane (DBCP) 0 99 64 130 232 249 15 250 45.62 7.1(29)0 98 62 133 1,2,4-Trichlorobenzene 49 10 50 42.57 11.2(40) Naphthalene 47.6 10 50 0 95 32 166 5.5(21) 105 Hexachlorobutadiene 0 111 63 130 111 10 100 138 48.08 8.9(36) 105 55 1.2.3-Trichlorobenzene 52.5 10 50 Surr: 1.2-Dichloroethane-d4 109 70 130 50 54.6 96 70 130 Surr: Toluene-d8 48.1



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Date: 08-Sep-11	QC	Summary Re	port			Work Order: 11082501
Surr: 4-Bromofluorobenzene	46.5	50	93	70	130	

#### Comments:

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

# Billing Information:

# CHAIN-OF-CUSTODY RECORD

# Alpha Analytical, Inc.

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

Report AttentionPhone NumberEMail AddressDavid Conner(619) 726-7311 xconnerd@battelle.orgBetsy Cutie(614) 424-4899 xcutiee@batelle.org

CA

Page: 1 of 1

WorkOrder: BMIS11082501

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

EDD Required : Yes

Sampled by: Chase Brogdon, D. Loera

 Cooler Temp
 Samples Received
 Date Printed

 3 °C
 25-Aug-2011
 25-Aug-2011

QC Level: DS4 Client's COC #: 24134, 024301 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates Job: 100006114/JPL Groundwater Monitoring PO: 287215

San Diego, CA 92101

Shane Walton

(614) 424-4117 x

waltons@battelle.org

Suite 1420

Client

Battelle Memorial Institute

655 West Broadway

Sample ID BMI11082501-08A TB-02-8/24/11 BMI11082501-06A DUPE-02-3Q11 BMI11082501-04A MW-14-2 BMI11082501-03A MW-14-3 BMI11082501-02A BMI11082501-01A MW-14-5 BMI11082501-09A MW-8 BMI11082501-07A BMI11082501-05A MW-14-4 EB-02-08/24/11 MW-14-1 Sample ID Client Š g Š ğ ğ å å å Matrix Date g 08/24/11 09:14 08/24/11 10:02 08/24/11 09:39 08/24/11 10:45 08/24/11 00:00 08/24/11 10:54 08/24/11 10:23 Collection No. of Bottles 08/24/11 10:40 08/24/11 07:20 Alpha Sub 4 G G G S 4 5 0 0 0 0 0 0 0 0 0 TAT 6 6 5 5 5 10 5 5 5 NO2, NO3, Perchlorate SO4, Cl, PO4 300\_0\_W Perchlorate Perchlorate Perchlorate 314\_W Perchlorate Perchlorate Perchlorate Perchlorate Requested Tests

METALS\_D VOC\_TIC\_ VOC\_W

W W Ç Ω Ç Ç Ç Ç VOC by 524 Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 Criteria Criteria VOC by 524 | VOC by 524 VOC by 524 Criteria Criteria Criteria Criteria Sample time taken from Reno Trip Blank 4/6/11 sample containers. Sample Remarks Level IV QC

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).:

	Logged in by:	
	Capabeth ador	Signature
Land to the state of the state	Elizabeth H	Print Name
	Alpha Analytical, Inc.	Company
	8.25:11 201	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

City, State, Zip -Billing Information: Phone Number -1/60 Sampled Sampled City, State, Zip Address 990 Client Name otto 0939 ADDITIONAL INSTRUCTIONS: 1,501 22 Relinquished by an Received by Received by Relinquished by Received by 쿭 Relinquished by 8/1///AQ 202 ひであるの See Key Matrix\* Below Columbos 0/0 Sampled by

CHASE BAOGDO N KING AVE Signature bmI 1108250101 TOWN AVG. C-22 GERMUP Lab ID Number DAVID CONNER 42 ハグメ Fax. 04 0.175 Tampleins 4320 ġ ·ObDurE 03 mw - 14 -2 08/18-25-8/24/11 MW- 14 - HI - mm Phone # (% (9) 726-73/1 EMail Address 168-02-0834 Report Attention P.O. # TRACKING # mw - 14 -3 17abeth MASSE ı 287215 CONNERD @ 14-5 02-Sample Description Brown エ W 278 Print Name 3011 2021 Phone (775) 355-1044 Sparks, Nevada 89431-5778 255 Glendale Avenue, Suite 21 Alpha Analytical, Inc. Fax (775) 355-0406 BATTELLE ORG 10b# 1005862 13B 245 614) 458-6614 からみ TAT Filtered 30,20 5/Various "See below Total and type of S VARCIOUS X 4 / NARA ious VARIOUS SVAMMINUS containers VARLING /VADING Ö AZ Samples Collected From Which State? Vocs Company 524.2 total CR PERCHIORATES (314.0) 737 98 Analyses Required 2 OTHER 2/21/21 18218 8-251 Edupmens Trup Blank Date DUPLICATE Global ID # Deptitato 12/51 EDD / EDF? YES\_ Required QC Level? Page # REMARKS D gs 00 J0 ( Time 20 9

₹

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. 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 \*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air V-Voa S-Soil Jar 0-0rbo T-Tedlar

B-Brass

P-Plastic

OT-Other

Billing Information:	Alpha Analytical, Inc.	Samples Collecte	m Which State? 024301
Address 505 Kins Aug 4320	Sparks, Nevada 89431-5778 Phone (775) 355-1044	31-5778 ID OR OTHER	Page # of
Phone Number 619 726-7311 Fax 614 458	Fax (775) 355-0406		equired /
Client Name David Conner	PO.#287215 , Job#/100	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	d QC Lev
	EMail Address Connord (a) battelle.		
City, State, Zip	Phone # 619 726-7311 Fax # 614	1.86	
Time Date See Key Sampled by ) Local	Report Attention David Corner	Total and type of / containers /	Giobal ID #
Sampled Sampled Below Lab ID Number (Use Only)	Sample Description IAI	VI Zi	TEMATAU
1045 124/1 AQ	MW-8-MW	3V 4PX XXX	
ADDITIONAL INSTRUCTIONS: *	bhaide Mitrate Witite Orthon	hosalite Sulfate	
		}	
Signature	Print Name	Company	Date Time
Relinquished by	David Loosa	Battelle	8-24-11 1200
Received by	CHASE GULDON	11816147	8/28/11 1320
Relinquished by	Clase Brown	ENS/Caps	8/24/11 1500
Received by San Co	# 8764 2021 5453		8/24/1/ 1500
Relinquished by			
Received by Consolid Little	Elizabeth HdCax	Hoha	8-25-11
*Key: AQ - Aqueous	*Key: AQ - Aqueous	V-Voa S-Soil Jar O-Orbo T-Tedlar dous samples will be returned to client or disposed of	B-Brass P-Plastic OI-Other at client expense. The report for the analysis
NOTE: Samples are discarded by days after results a	le leported alliess other all angenions are mase: mases: mases: mases: mases: mases: mases: mases: mases: mases	of the leberatory is limited to the amount paid for the report	-

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.



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:** 

 $0 \, ^{\circ} \mathbf{C}$ 

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	<u>Analyte</u>
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

Kandy Saulmer

Dalter Hirkon



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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	1	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 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: 08/26/11

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 Date Sampled 08/25/11 08:51	Perchlorate	1.12	1.00 μg/L	08/26/11 11:27	08/26/11 20:14
Client ID: MW-17-3 Lab ID: BM111082601-02A Date Sampled 08/25/11 09:23	Perchlorate	6.62	1.00 μg/L	08/26/11 11:27	08/26/11 13:56
Client ID: MW-17-2 Lab ID: BMI11082601-03A Date Sampled 08/25/11 09:53	Perchlorate	78.7	5.00 μg/L	08/26/11 11:27	08/26/11 19:37
Client ID: <b>EB-03-8/25/11</b> Lab ID: <b>BMI11082601-04A</b> Date Sampled 08/25/11 09:42	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/26/11 15:09
Client ID: MW-18-5 Lab ID: BMII 1082601-06A Date Sampled 08/25/11 11:13	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/26/11 20:32
Client ID: MW-18-4 Lab ID: BMI11082601-07A Date Sampled 08/25/11 11:44	Perchlorate	10.9	1.00 μg/L	08/26/11 11:27	08/26/11 15:46
Client ID: MW-18-3 Lab ID: BMI11082601-08A Date Sampled 08/25/11 12:13	Perchlorate	. 144	10.0 μg/L	08/26/11 11:27	08/29/11 19:55
Client ID: <b>MW-18-2</b> Lab ID: BMI11082601-09A Date Sampled 08/25/11 12:51	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/26/11 16:23
Client ID: <b>DUPE-03-3Q11</b> Lab ID: BMI11082601-10A Date Sampled 08/25/11 00:00	Perchlorate	ND .	1.00 μg/L	08/26/11 11:27	08/26/11 20:51
Client ID: MW-13 Lab ID: BMI11082601-11A Date Sampled 08/25/11 08:43	Perchlorate	253	10.0 μg/L	08/26/11 11:27	08/29/11 14:10
Client ID: MW-5 Lab ID: BMI11082601-12A Date Sampled 08/25/11 11:00	Perchlorate	ND	1.00 μg/L	08/26/11 11:27	08/26/11 21:46



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Client ID: MW-10

Lab ID: BM111082601-13A Perchlorate

Date Sampled 08/25/11 13:57

ND

 $1.00~\mu\text{g/L}$ 

ND = Not Detected

Roger Scholl

Kandy Davlmer

Walter Hinhow

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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

#### Metals by ICPMS EPA Method 200.8

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-17-4 Lab ID: BMI11082601-01A Date Sampled 08/25/11 08:51	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:16
Client ID: MW-17-3 Lab ID: BMI11082601-02A Date Sampled 08/25/11 09:23	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/29/11 23:53
Client ID: <b>MW-17-2</b> Lab ID: BMI11082601-03A Date Sampled 08/25/11 09:53	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:22
Client ID: <b>EB-03-8/25/11</b> Lab ID: BM111082601-04A Date Sampled 08/25/11 09:42	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:28
Client ID: <b>MW-18-4</b> Lab ID: BM111082601-07A Date Sampled 08/25/11 11:44	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:34
Client ID: MW-18-3 Lab ID: BMI11082601-08A Date Sampled 08/25/11 12:13	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:40
Client ID: <b>MW-18-2</b> Lab ID: BMI11082601-09A Date Sampled 08/25/11 12:51	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:46
Client ID: <b>DUPE-03-3Q11</b> Lab ID: BMI11082601-10A Date Sampled 08/25/11 00:00	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 00:52
Client ID: MW-13 Lab ID: BMI11082601-11A Date Sampled 08/25/11 08:43	Chromium (Cr)	0.0060	0.0050 mg/L	08/29/11 17:10	08/30/11 00:58
Client ID: <b>MW-5</b> Lab ID: BM111082601-12A Date Sampled 08/25/11 11:00	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 09:42
Client ID: <b>MW-10</b> Lab ID: BMI11082601-13A Date Sampled 08/25/11 13:57	Chromium (Cr)	ND	0.0050 mg/L	08/29/11 17:10	08/30/11 09:48



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ND = Not Detected

Roger Scholl

Kandy Sandner

Dalter Hinkman

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** 



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#### ANALYTICAL REPORT

Attn: David Conner

Phone: (619) 726-7311

(614) 458-6641

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

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

			Estimated		
	Parameter	Estimated Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-17-4 Lab ID: BMII1082601-01A Date Received: 08/26/11 Date Sampled: 08/25/11 08:51	* * * None Found * * *	ND	2.0 μg/L	08/29/11 17:10	09/01/11 13:11
Client ID: MW-17-3 Lab ID: BMI11082601-02A Date Received: 08/26/11 Date Sampled: 08/25/11 09:23	*** None Found ***	ND	2.0 μg/L	09/01/11 13:32	09/01/11 13:32
Client ID: MW-17-2 Lab ID: BMI11082601-03A  Date Received: 08/26/11 Date Sampled: 08/25/11 09:53	*** None Found ***	ND	2.0 μg/L	09/01/11 13:54	09/01/11 13:54
Client ID : EB-03-8/25/11  Lab ID : BMI11082601-04A  Date Received : 08/26/11  Date Sampled : 08/25/11 09:42	* * * None Found * * *	NĐ	2.0 μg/L	09/01/11 12:27	09/01/11 12:27
Client ID: TB-03-8/25/11 Lab ID: BMI11082601-05A Date Received: 08/26/11 Date Sampled: 08/25/11 07:30	* * * None Found * * *	ND	2.0 μg/L	09/01/11 12:49	09/01/11 12:49
Client ID: MW-18-5 Lab ID: BMI11082601-06A Date Received: 08/26/11 Date Sampled: 08/25/11 11:13	*** None Found ***	ND	2.0 μg/L	09/01/11 14:15	09/01/11 14:15
Client ID: MW-18-4 Lab ID: BMI11082601-07A Date Received: 08/26/11 Date Sampled: 08/25/11 11:44	* * * None Found * * *	ND	2.0 μg/L	09/01/11 14:37	09/01/11 14:37
Client ID: MW-18-3 Lab ID: BM111082601-08A Date Received: 08/26/11 Date Sampled: 08/25/11 12:13	* * * None Found * * *	ND	2.0 μg/L	09/01/11 14:59	09/01/11 14:59
Client ID: MW-18-2 Lab ID: BMI11082601-09A Date Received: 08/26/11 Date Sampled: 08/25/11 12:51	* * * None Found * * *	, ND	2.0 μg/L	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  Date Received: 08/26/11  Date Sampled: 08/25/11 00:00	* * * None Found * * *	ND	2.0 μg/L	09/01/11 15:41 09/01/11 15:41
Client ID: MW-13  Lab ID: BMI11082601-11A  Date Received: 08/26/11  Date Sampled: 08/25/11 08:43	*** None Found ***	ND	2.0 μg/L	09/01/11 16:03 09/01/11 16:03
Client ID: MW-5  Lab ID: BMI11082601-12A  Date Received: 08/26/11  Date Sampled: 08/25/11 11:00	*** None Found ***	ND	2.0 μg/L	09/01/11 16:25 09/01/11 16:25
Client ID: MW-10  Lab ID: BMI11082601-13A  Date Received: 08/26/11  Date Sampled: 08/25/11 13:57	* * * None Found * * *	ND	2.0 μg/L	09/01/11 16:46 09/01/11 16:46

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Kandy Saulun

Dalter Amedica

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



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-01A

Client I.D. Number: MW-17-4

**David Conner** Attn: Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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-Chiorotoluene	ND	0.50	μg/L
14	cis-1,2-Dichloroethene	ND	0.50	µg/L	49	2-Chiorotoluene	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 (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

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μg/L

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9/8/11 Report Date



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#### **ANALYTICAL REPORT**

**David Conner** 

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-02A

Client I.D. Number: MW-17-3

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

Attn:

----

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 L	imit
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	Bromochioromethane	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 (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachioroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Santur

ND

Walter Aridon

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

μg/L

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** 



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

an Diego, CA 92101

100006114/JPL Groundwater Monitoring

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

Attn: David Conner

Phone: (

Fax:

: (619) 726-7311 (614) 458-6641

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 L	imit
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-Xvlene	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-Propvibenzene	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-chioropropane (DBC	P) 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	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			1	, ,	
33	Dibromochloromethane	ND	0.50	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl KundgeSaulun

ND

Walter Hinkow

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

µg/L

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



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

#### ANALYTICAL REPORT

Phone: (619) 726-7311

**David Conner** 

Attn:

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring Job:

Alpha Analytical Number: BMI11082601-04A

Client I.D. Number: EB-03-8/25/11

(614) 458-6641 Fax:

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 L	imit
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 (DBC)	P) 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	<b>6</b> 6	Surr: 4-Bromofluorobenzene	89	(70-130)	%REC
32	1,3-Dichloropropane	ND	0.50	μg/L			•		
33	Dibromochloromethane	ND	0.50	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

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.

1.0

μg/L

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



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101 Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-05A

Client I.D. Number: TB-03-8/25/11

David Conner Attn: Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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	. •
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	
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-Chiorotoluene	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 (DBCI	P) 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					
24	1.2 Dibermonthers (CDD)			. •					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

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

ND

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.

1.0

μg/L

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



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

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

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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-Xvlene	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	Isopropylberizene	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-Chiorotoluene	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 (DBC)	P) 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-Dichloroetharie-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	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA \bullet (916)\ 366-9089\ /\ Las\ Vegas,\ NV \bullet (702)\ 736-7522\ /\ Carson,\ CA \bullet (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

µg/L

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.

**Report Date** 



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

Alpha Analytical Number: BMI11082601-07A

Client I.D. Number: MW-18-4

Attn: David Conner

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

(614) 458-6641

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 Li	imit
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	Bromochioromethane	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 (DBCI	P) 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	_		,	, ,	

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

33 Dibromochloromethane

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Santon

ND

ND

Walter Hirihon

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



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-08A

Client I.D. Number: MW-18-3

Attn: David Conner

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

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 Li	imit
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-Xvlene	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-Xvlene	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 (DBC)	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soulmer a

ND

ND

Walter Strikm

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

1.0

μg/L

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



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-09A

Client I.D. Number: MW-18-2

Attn: David Conner

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

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 L	imit
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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Saulur D

ND

Walter Hirihun

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.

μg/L

9/8/11 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.



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-10A

Client I.D. Number: DUPE-03-3Q11

**David Conner** 

(619) 726-7311 Phone: Fax:

(614) 458-6641

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 L	imit
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	
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 (DBC	P) ND	2.5	μg/L
25	Trichloroethene	ND	0.50	μg/L	60	1,2,4-Trichiorobenzene	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					
24	1.2 Dibromosthone (CDD)	N.D.		. •					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA \bullet (916)\ 366-9089\ /\ Las\ Vegas, NV \bullet (702)\ 736-7522\ /\ Carson, CA \bullet (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

μg/L

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** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job: 100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11082601-11A

Client I.D. Number: MW-13

Attn: David Conner

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

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 L	imit
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-Tetrachioroethane	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-Butvlbenzene	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 (DBC)	P) 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				( = 100)	
33	Dibromochloromethane	ND	0.50	μg/L					
24	1.2 Dibromosthana (EDD)	1 10	2.00	-o-					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Saulm

ND

Walter Firehour

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@aipha-analytical.com

1.0

µg/L

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** 



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

#### ANALYTICAL REPORT

**David Conner** 

(619) 726-7311

(614) 458-6641

Attn:

Fax:

Phone:

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

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 L	imit
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	
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	
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	
12	1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.50	
13	2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND	0.50	
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-Butvlbenzene	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 (DBCI	P) 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			1	(	
33	Dibromochloromethane	ND	0.50	μg/L				*	

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

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μg/L

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



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#### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101 Attn:

**David Conner** 

Phone: Fax:

(619) 726-7311 (614) 458-6641

100006114/JPL Groundwater Monitoring

Sampled: 08/25/11 13:57

Received: 08/26/11

Extracted: 09/01/11 16:46 Analyzed: 09/01/11 16:46

Alpha Analytical Number: BMI11082601-13A

Client I.D. Number: MW-10

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

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting L	imit
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	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	
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-Xvlene	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 (DBC)		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)	
32	1,3-Dichloropropane	ND	0.50	μg/L		Same Someone	, 0,	(.0 100)	,ui \L
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					
25	Totrochloroothone	N.D	1.0	Pg,∟					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

ND

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

μg/L

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.

**Report Date** 



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## **VOC Sample Preservation Report**

Work Order: BMI11082601 Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pН	
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	



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<b>Date:</b> 30-Aug-11	(	QC Sι	ımmar	y Repor	t				<b>Work Ordo</b> 11082601	
Method Blank File ID: 20 Sample ID: MB-27197 Analyte	Units : <b>mg/L</b> Result	Type: <b>M</b> PQL	B: Run ID: <b>IC</b>	est Code: EF atch ID: 2719 _1_110826A SpkRefVal	97 N		Prep l	Date:	08/26/2011 12:14 08/26/2011 12:23 Val %RPD(Limit)	Qual
Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	ND ND ND ND ND	0.5 0.25 0.25 0.5 0.5				,	,			
Laboratory Fortified Blank		Type: LI		est Code: Ef		hod 300.0				
File ID: 21	l lmita /			atch ID: 2719			_		08/26/2011 12:33	
Sample ID: LFB-27197 Analyte	Units : mg/L Result	PQL		_1_110826# _SnkReft/al		: I CL(ME)	Prep I		<b>08/26/2011 12:23</b> Val %RPD(Limit)	Qual
Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	49.1 4.91 5.24 5.39 101	0.5 0.25 0.25 0.5 0.5	50 5 5 5	,	98 98 105 108 101	90 90 90 90 90	110 110 110 110 110			
Sample Matrix Spike		Type: LI	FM T	est Code: EF	A Met	hod 300.0				
File ID: <b>25</b>			В	atch ID: 2719	97		Analy	sis Date:	08/26/2011 13:47	
Sample ID: 11082601-11ALFM	Units : mg/L			_1_110826			Prep l		08/26/2011 12:23	<u>.</u> .
Analyte	Result	PQL					· · · · ·	RPDRef\	/al %RPD(Limit)	Qual
Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	131 10 18.3 11.6 248	0.5 0.25 0.25 0.5 0.5	100 10 10 10 200	29.73 0 7.289 0 57.35	102 100 110 116 95	80 80 80 80 80	120 120 120 120 120			
Sample Matrix Spike Duplicate		Type: LI	FMD T	est Code: EF	PA Met	hod 300.0				
File ID: <b>26</b>				atch ID: 2719					08/26/2011 14:06	
Sample ID: 11082601-11ALFMD	Units : mg/L			_1_110826			Prep (		08/26/2011 12:23	0 -1
Analyte  Chloride Nitrite (NO2) - N Nitrate (NO3) - N Phosphate, ortho - P Sulfate (SO4)	131 10.3 18.3 12.1 247	9QL 0.5 0.25 0.25 0.5 0.5	100	29.73 0 7.289 0 57.35	101 103 110 121 95	80 80 80 80 80 80	120 120 120 120 120 120	131.3 10 18.29 11.59 248.7	2.5(15) 9 0.1(15) 9 4.0(15)	Qual M1

#### 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.



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<b>Date:</b> 06-Sep-11		(	QC S	umma	ry Repor	t			Work Orde 11082601	r: 
Method Blan			Type: I	(	Test Code: <b>E</b> Batch ID: <b>271</b> <b>C 3 110826</b> I	94	hod 314.0	Analysis Date:	08/26/2011 12:24 08/26/2011 11:27	
Sample ID: Analyte	MB-27194	Units : <b>µg/L</b> Result	PQL				LCL(ME)	UCL(ME) RPDRef		Qual
Perchlorate		ND		1						
Laboratory File ID: 15 Sample ID:	Fortified Blank	Units : µg/L	Type: I		Test Code: <b>E</b> Batch ID: <b>271</b> <b>C_3_110826</b>	94	hod 314.0	Analysis Date: Prep Date:	08/26/2011 12:42 08/26/2011 11:27	
Analyte		Result	PQL	SpkVa	l SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		23.5		2 2	5	94	85	115		
Sample Mat File ID: 20 Sample ID:	rix Spike 11082601-02ALFM	Units : µg/L	Type: I		Test Code: <b>E</b> Batch ID: <b>271</b> <b>C 3 110826</b>	94	hod 314.0		08/26/2011 14:14 08/26/2011 11:27	
Analyte	1 100200 1-02ALF W	Result	PQL				LCL(ME)	UCL(ME) RPDRef		Qual
Perchlorate		31.4		2 2			80	120		
Sample Mat	rix Spike Duplicate		Type:		Test Code: E Batch ID: <b>271</b>		thod 314.0	Analysis Date:	08/26/2011 14:33	
Sample ID: Analyte	11082601-02ALFMD	Units : <b>µg/L</b> Result	PQL		C_3_110826 al SpkRefVa		C LCL(ME)	Prep Date: UCL(ME) RPDRef	<b>08/26/2011 11:27</b> Val %RPD(Limit)	Qual
Perchlorate		29.9		2 2	5 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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<b>Date:</b> 02-Sep-11	C	QC S	ummary	y Report	,				<b>Work Orde</b> 11082601	
Method Blank File ID: 082911.B\098_M.D\		Type: N		est Code: EP atch ID: 2721		hod 200.8	Analysis	Date:	08/29/2011 23:23	
Sample ID: MB-27211	Units : mg/L		Run ID: ICI	P/MS_11082	9D		Prep Dat	te:	08/29/2011 17:10	
Analyte	Result	PQL	SpkVal	SpkRefVal 9	%REC	LCL(ME)	UCL(ME) RF	PDRef√	/al %RPD(Limit)	Qual
Chromium (Cr)	ND	0.00	5							
Laboratory Control Spike		Type: <b>L</b>	.CS Te	est Code: EP	A Met	hod 200.8				
File ID: 082911.B\099_M.D\			Ва	tch ID: 2721	1		Analysis	Date:	08/29/2011 23:29	
Sample ID: LCS-27211	Units : mg/L		Run ID: ICI	P/MS_11082	9D		Prep Dat	te:	08/29/2011 17:10	
Analyte	Result	PQL	SpkVal	SpkRefVal <sup>o</sup>	%REC	LCL(ME)	UCL(ME) RF	PDRef√	/al %RPD(Limit)	Qual
Chromium (Cr)	0.0495	0.00	0.05		99	85	115			
Sample Matrix Spike		Type: N	<b>IS</b> Te	est Code: EP	A Met	hod 200.8				<del>,</del>
File ID: 082911.B\104_M.D\			Ba	tch ID: 2721	1		Analysis	Date:	08/29/2011 23:59	
Sample ID: 11082601-02AMS	Units : mg/L		Run ID: ICI	P/MS_11082	9D		Prep Dat	te:	08/29/2011 17:10	
Analyte	Result	PQL	SpkVal	SpkRefVal <sup>c</sup>	%REC	LCL(ME)	UCL(ME) RF	PDRef√	/al %RPD(Limit)	Qual
Chromium (Cr)	0.0452	0.00	0.05	0	90	<b>7</b> 0	130			
Sample Matrix Spike Duplicate		Type: N	ASD Te	est Code: EP	A Met	hod 200.8				
File ID: 082911.B\105_M.D\			Ba	atch ID: 2721	1		Analysis	Date:	08/30/2011 00:05	
Sample ID: 11082601-02AMSD	Units : mg/L		Run ID: ICI	P/MS_11082	9D		Prep Dat	te:	08/29/2011 17:10	
Analyte	Result	PQL	SpkVal	SpkRefVal <sup>6</sup>	%REC	LCL(ME)	UCL(ME) RF	PDRef∖	/al %RPD(Limit)	Qual
Chromium (Cr)	0.0481	0.00	0.05	. 0	96	70	130	0.0451	15 6.4(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.



<b>Date:</b> 08-Sep-11		(	QC S	umm	ary Report				<b>Work Orde</b> 11082601	
Method Blank			Type: N	IBLK	Test Code: EPA	A Method				
File ID: 11090107.D					Batch ID: MS15	W0901M		Analysis Date:	09/01/2011 10:18	
•	K MS15W0901M	Units : µg/L		Run ID	: MSD_15_11090	)1B		Prep Date:	09/01/2011 10:18	
Analyte		Result	PQL	Spk\	√al SpkRefVal %	6REC LC	L(ME) UCL	(ME) RPDRef	/al %RPD(Limit)	Qua
Dichlorodifluorometha	ane	ND	0.5	<u> </u>						
Chloromethane		ND	1							
Vinyl chloride Chloroethane		ND	0.5							
Bromomethane		ND ND	0.5 1							
Trichlorofluoromethar	ne	ND ND	0.5							
1,1-Dichloroethene		ND	0.5							
Dichloromethane		ND	1							
Freon-113		ND	0.5							
trans-1,2-Dichloroeth Methyl tert-butyl ethe		ND	0.5							
1,1-Dichloroethane	(WIBE)	ND ND	0.5 0.5							
2-Butanone (MEK)		ND ND	10							
cis-1,2-Dichloroethen	е	ND	0.5							
Bromochloromethane	•	ND	0.5							
Chloroform		ND	0.5							
2,2-Dichloropropane 1,2-Dichloroethane		ND	0.5							
1,1,1-Trichloroethane		ND ND	0.5							
1,1-Dichloropropene		ND ND	0.5 0.5							
Carbon tetrachloride		ND	0.5							
Benzene		ND	0.5							
Dibromomethane		ND	0.5							
1,2-Dichloropropane Trichloroethene		ND	0.5							
Bromodichlorometha	מר	ND ND	0.5 0.5							
4-Methyl-2-pentanone		ND	2.5							
cis-1,3-Dichloroprope	ne	ND	0.5							
trans-1,3-Dichloropro		ND	0.5							
1,1,2-Trichloroethane		ND	0.5							
Toluene 1,3-Dichloropropane		ND	0.5							
Dibromochlorometha	10	ND ND	0.5 0.5							
1,2-Dibromoethane (E		ND	0.5							
Tetrachloroethene	,	ND	0.5							
1,1,1,2-Tetrachloroett	nane	ND	0.5							
Chlorobenzene		ND	0.5							
Ethylbenzene		ND	0.5							
m,p-Xylene Bromoform		· ND ND	0.5							
Styrene		ND	0.5 0.5							
o-Xylene		ND	0.5							
1,1,2,2-Tetrachloroeth		ND	0.5							
1,2,3-Trichloropropan	е	ND	1							
Isopropylbenzene Bromobenzene		ND	0.5							
n-Propylbenzene		ND ND	0.5 0.5							
4-Chlorotoluene		ND	0.5							
2-Chlorotoluene		ND	0.5							
1,3,5-Trimethylbenze	ne	ND	0.5				•			
tert-Butylbenzene		ND	0.5							
1,2,4-Trimethylbenzer sec-Butylbenzene	ne	ND	0.5							
1,3-Dichlorobenzene		ND ND	0.5 0.5							
1,4-Dichlorobenzene		ND ND	0.5							
4-Isopropyltoluene		ND	0.5							
1,2-Dichlorobenzene		ND #	0.5							
n-Butylbenzene	(DDCE)	ND	0.5							
1,2-Dibromo-3-chloro 1,2,4-Trichlorobenzen		ND	2.5							
1,2,4-Trichiorobenzen Naphthalene	<del>C</del>	ND ND	1 1							
Hexachlorobutadiene		ND ND	1							
1,2,3-Trichlorobenzen	е	ND	1							
Surr: 1,2-Dichloroetha	ine-d4	10.7	•	,	10			30		
Surr: Toluene-d8		9.87		•				30		



<b>Date:</b> _08-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11082601
Surr: 4-Bromofluorobenzene	9.12	10	91	70	130	



Laboratory Control C								
Laboratory Control Sp	ike	Type: Le	CS T	est Code: EPA Meth	hod SW82	260B		
File ID: 11090104.D			Ва	atch ID: MS15W090	1M	Analysis Da	te: <b>09/01/2011 09:06</b>	
Sample ID: LCS MS15\	<b>W0901M</b> Units : μg/i	L	Run ID: M:	SD_15_110901B		Prep Date:	09/01/2011 09:06	
Analyte	Result	PQL			LCL(ME)	UCL(ME) RPDF	RefVal %RPD(Limit)	Qua
Dichlorodifluoromethane	7.8	1		78	70	130		
Chloromethane	10.2	2		102	70	130		
Vinyl chloride	10.6	1		106	70	130		
Chloroethane	12.4	1		124	70	130		
Bromomethane	7.06	2	10	71	70	130		
Trichlorofluoromethane	12.1	1		121	70	130		
1,1-Dichloroethene	9.47	1	10	95	70	130		
Dichloromethane Freon-113	9.44	2	10	94	70	130		
trans-1,2-Dichloroethene	10.2 9.87	1 1	10	102 99	70 70	137 130		
Methyl tert-butyl ether (MTB	E) 9.67	0.5		99 107	70 70	130		
1,1-Dichloroethane	9.92	0.5		99	70	130		
2-Butanone (MEK)	274	10		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 Carbon tetrachloride	10.5	1	10	105	70	130		
Benzene	10	1	10	100	70 70	130		
Dibromomethane	10.1 10.6	0.5 1	10 10	101 106	70 70	130 130		
1,2-Dichloropropane	9.86	1	10	99	70 70	130		
Trichloroethene	9.94	1	10	99	70	130		
Bromodichloromethane	10.3	i 1	10	103	70	130		
4-Methyl-2-pentanone (MIB)	K) 30.5	2.5		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 1,3-Dichloropropane	9.94	0.5	10	99	70	130		
Dibromochloromethane	9.97 8.98	1 1	10	99.7 90	70 70	130 130		
1,2-Dibromoethane (EDB)	20.4	2	10 20	90 102	70 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		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 1,1,2,2-Tetrachloroethane	10.3	0.5		103	70	130		
1,2,3-Trichloropropane	9.46 20.5	1		95 102	70 70	130		
Isopropylbenzene	9.3	2 1	20 10	102 93	70 70	130 130		
Bromobenzene	9.71	1	10	93 97	70 70	130		
n-Propylbenzene	9.5	1	10	95	70	130		
4-Chlorotoluene	9.32	<u>i</u>	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 1,3-Dichlorobenzene	9.34	1	10	93	70 70	130		
1,4-Dichlorobenzene	10	1	10	100	70 70	130		
4-Isopropyltoluene	9.19 9.79	1	10 10	92 98	70 70	130 130		
1,2-Dichlorobenzene	9.79 9.21	1	10	98 92	70 70	130		
n-Butylbenzene	10.1	1	10	101	70 70	130		
1,2-Dibromo-3-chloropropan	ie (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		104	70	130		
·	9.78	2 2	20 10 10	104 98 110	70 70 70	130 130 130		



<b>Date:</b> _08-Sep-11	QC	Summary Rej	port			<b>Work Order:</b> 11082601
Surr: 4-Bromofluorobenzene	9.16	10	92	70	130	



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<b>Date:</b> 08-Sep-11	(	QC Su	mmar	y Repor	t			<b>Work Orde</b> 11082601	
Sample Matrix Spike		Type: MS	Te	est Code: El	PA Met	hod SW82	60B		
File ID: 11090108.D			Ва	atch ID: MS1	15W090	01M	Analysis Date	e: 09/01/2011 10:40	
Sample ID: 11082601-02AMS	Units : µg/L	R		SD_15_1109			Prep Date:	09/01/2011 10:40	
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRe	efVal %RPD(Limit)	Qual
Dichlorodifluoromethane	37.9	2.5	50	0		21	138		
Chloromethane	50.6	10	50	0	101	23	144		
Vinyl chloride Chloroethane	55.7 50.4	2.5	50	0	111	49 21	136		
Bromomethane	59.4 39.5	2.5 10	50 50	0 0	119 79	21 10	159 174		
Trichlorofluoromethane	61.1	2.5	50	0	122	32	154		
1,1-Dichloroethene	45.8	2.5	50	Ō	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 Methyl tert-butyl ether (MTBE)	47.4 48.4	2.5 1.3	50 50	0	95 97	63 47	130 150		
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 1,2-Dichloroethane	49 51.5	2.5 2.5	50 50	0	98 103	38 65	154 134		
1,1,1-Trichloroethane	51.5 51.1	2.5 2.5	50 50	0	103	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 Trichloroethene	47.4	2.5	50	0	95	70	131		
Bromodichloromethane	48.5 49.1	2.5 2.5	50 50	0	97 98	65 50	144 157		
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 1,3-Dichloropropane	47.7	1.3	50	0	95	68 70	130		
Dibromochloromethane	45.6 40.9	2.5 2.5	50 50	0	91 82	70 42	130 155		
1,2-Dibromoethane (EDB)	92.4	2.3 5	100	0	92	70	130		
Tetrachloroethene	47.8	2.5	50	Ö	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 m,p-Xylene	51.3	1.3	50	0	103	68	130		
Bromoform	49.7 40.1	1.3 2.5	50 50	0	99 80	68 65	131 143		
Styrene	42.7	2.5	50	0	85	59	153		
o-Xylene	49.6	1.3	50	Ö	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 Bromobenzene	47.6 47.9	2.5	50 50	0	95 96	55 70	138		
n-Propylbenzene	47.9 48.9	2.5 2.5	50 50	0	98	67	130 133		
4-Chlorotoluene	46.5	2.5	50	0	93	70	130		
2-Chlorotoluene	46.4	2.5	50	Ō	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 sec-Butylbenzene	50.1	2.5	50	0	100	65	135		
1,3-Dichlorobenzene	48.1 50	2.5 2.5	50 50	0	96 100	68 70	135 130		
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) 1,2,4-Trichlorobenzene	221	15	250	0	88	64	130		
Naphthalene	44.6 37.1	10 10	50 50	0	89 74	62 32	133 166		
Hexachlorobutadiene	104	10	100	0	104	63	130		
1,2,3-Trichlorobenzene	43.5	10	50	Ö	87	55	138		
Surr: 1,2-Dichloroethane-d4	54.3		50		109	70	130		
Surr: Toluene-d8	47.4		50		95	70	130		



<b>Date:</b> 08-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11082601
Surr: 4-Bromofluorobenzene	46.2	50	92	70	130	



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Date: Work Order: QC Summary Report 08-Sep-11 11082601 Sample Matrix Spike Duplicate Type: MSD Test Code: EPA Method \$W8260B 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 76 37.9 2.5 50 21 138 0.7(33)Chloromethane 50 53.1 10 0 106 23 144 50.57 4.9(27)Vinvl chloride 56.1 2.5 50 0 112 49 136 55.67 0.8(21)Chloroethane 60.1 2.5 50 Λ 21 159 59.37 1.3(40) 120 Bromomethane 47 17.4(40) 10 50 94 10 174 39.48 Trichlorofluoromethane 2.5 60 50 0 120 32 154 61.09 1.8(37)1,1-Dichloroethene 45.9 2.5 50 O 92 64 130 45 77 0.3(21)Dichloromethane 45.4 10 50 91 130 45.33 0.1(20)Freon-113 2.5 50 52 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 50 100 48.42 3.5(40) 1.3 47 150 1,1-Dichloroethane 48.6 2.5 97 48.14 0.8(20)50 0 66 130 2-Butanone (MEK) 897 50 1000 0 90 23 182 868.2 3.2(22)cis-1.2-Dichloroethene 48.6 2.5 97 70 48.5 0.2(20)50 130 Bromochloromethane 2.5 50.4 50 101 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 2.5 50 102 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 58 1.8(20) 50 0 102 148 50.02 Benzene 49.8 59 1.3 50 0 99.6 138 49.56 0.5(21)Dibromomethane 50.8 2.5 70 50 0 102 130 49.74 2.2(20)1,2-Dichloropropane 47.8 2.5 50 n 96 70 131 47.43 0.7(20)Trichloroethene 48.54 49 2.5 50 98 1.0(20)144 Bromodichloromethane 50.2 2.5 0 100 50 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 0 93 45.54 2.6(20) 50 131 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 0 99.7 70 131 49.08 1.6(20)50 Toluene 48.5 1.3 50 0 97 130 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 ٥ 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 70 50 0 95 130 46.35 2.6(20)Ethylbenzene 52.1 1.3 50 0 104 68 1.7(20) 130 51.26 m.p-Xvlene 50.7 101 50 68 131 49.71 1.9(20)**Bromoform** 418 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 49.59 2.0(20)101 130 1,1,2,2-Tetrachloroethane 45.1 2.5 50 0 90 43.42 67 130 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 97 0 47.93 50 70 130 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 46.42 130 0.5(20)1.3.5-Trimethylbenzene 50.5 0 101 50 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 48.1 1.0(20)135 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 45.31 130 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 82 50 0 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 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



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<b>Date:</b> _08-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11082601
Surr: 4-Bromofluorobenzene	46.9	50	94	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

# Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778

TEL: (775) 355-1044 FAX: (775) 355-0406

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

Battelle Memorial Institute

655 West Broadway Suite 1420

WorkOrder: BMIS11082601

Page: 1 of 2

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

EDD Required: Yes

Sampled by: Chase Brogdon, D. Loera Cooler Temp

Samples Received 26-Aug-2011 26-Aug-2011

Date Printed

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

Job: 100006114/JPL Groundwater Monitoring

Shane Walton Betsy Cutie

(614) 424-4117 x

waltons@battelle.org

Client's COC #: 25562, 25563, 024302

PO: 287215

San Diego, CA 92101

						Requested Tests	d Tests	
Alpha Sample ID	Client Sample ID	Collection Matrix Date	No. of Bottles Alpha Sub TAT	300_0_W 314_W	METALS W	D VOC_TIC_ VOC_W	VOC_W	Sample Remarks
BMI11082601-01A	MW-17-4	AQ 08/25/11 08:51	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-02A	MW-17-3	AQ 08/25/11 09:23	10 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	 MS/MSD
BMI11082601-03A	MW-17-2	AQ 08/25/11 09:53	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-04A	EB-03-8/25/11	AQ 08/25/11 09:42	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	Sample time taken from sample containers.
BMI11082601-05A	TB-03-8/25/11	AQ 08/25/11 07:30	1 0 9			VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	 Reno Trip Blank 4/6/11
BMI11082601-06A	MW-18-5	AQ 08/25/11 11:13	4 0 9	Perchlorate	ate	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-07A	MW-18-4	AQ 08/25/11 11:44	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	Level IV QC
BMI11082601-08A	MW-18-3	AQ 08/25/11 12:13	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-09A	MW-18-2	AQ 08/25/11 12:51	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-10A	DUPE-03-3Q11	AQ 08/25/11 00:00	5 0 9	Perchlorate	ate Cr	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	

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

Comments:

Logged in by:	
Chapath	Signatu
Udcex	re
Elizabeth	Print Name
Adcax	)
Alpha Analytical, Inc.	Company
8:26:11 1023	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. 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

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

Page: 2 of 2

WorkOrder: BMIS11082601

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

EDD Required: Yes

Sampled by: Chase Brogdon, D. Loera Cooler Temp Samples Received

26-Aug-2011 26-Aug-2011 Date Printed

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

Job :

100006114/JPL Groundwater Monitoring

PO: 287215

San Diego, CA 92101

Shane Walton

(614) 424-4117 x

waltons@battelle.org

Suite 1420

**Battelle Memorial Institute** 

655 West Broadway

									Request	ed Tests	
Alpha Sample ID	Client Sample ID	Collection No. of Bottles  Matrix Date Alpha Sub	No. of Bottles Alpha Sub TAT	F Bottle Sub	s TAT	300_0_W	314_W	300_0_W 314_W METALS_D	W VOC_TIC_ VOC_W	M_DOA	Sample Remarks
BMI11082601-11A MW-13	MW-13	AQ 08/25/11 08:43	7	0	ဖ	NO2, NO3, Perchlorate SO4, CI, PO4	Perchlorate	Ω.	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-12A MW-5	MW-5	AQ 08/25/11 11:00	5	0	9		Perchlorate	Ç	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	
BMI11082601-13A MW-10	MW-10	AQ 08/25/11 13:57	5	0	9		Perchlorate	Ω	VOC by 524 VOC by 524 Criteria Criteria	VOC by 524 Criteria	

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).:

Comments:

Logged in by:	
Compabilh acex	Signature
Elizabith flolcox	Print Name
Alpha Analytical, Inc.	Company
8:26:11:02:	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

# Name . City, State, Zip Address Billing Information: 200 Columbus, OH KING Sparks, Nevada 89431-5778 Phone (775) 355-1044 Fax (775) 355-0406 255 Glendale Avenue, Suite 21 Alpha Analytical, Inc. ō A Samples Collected From Which State? CA X NV OTHER Ď ×

25562

			0730 S/25/11 8	426/11	,	0953 phs//	0973	0851 825/1 AQ	Sampled Below	Time Date Matrix* S	City, State, Lip	Address 3840 OlD	Client Name	Phone Number
			8.	· 0+		·03	.02	087 865/1 AQ BMI 108260101 MW - 17 - 4	ffice Only)		CITY, State, AP DIEGO CH 93110		Client Name (COMMENTERILE / THAVID COMMENT	Fax
			TB-03-8/15/11	x 65-03-8/25/11		.03 mw - 17 - 2	02 mw - 17 - 3	H - TI - WM	Sample Description	Report Attention DAUID CONNER	Phone # (619) 726-73/1		12482 #OA	
								None	TAT		Fax & 14) 458 -	IC. ORG	939 # qor	
			70	2020		5 lvary	10/wars	5/4000	Filtered ** See below	Total and type of	158-6614	Υ'	600 5862	
			X	× ×		XXX	XXX	X X	V0 104 PEA	CS (184 C) (24 H)	(S) (R) (N) (N) (N) (N) (N) (N) (N) (N) (N) (N	24:200 (200	8) (9)	Analyses
				Dec.					/ /	_	_	_		Analyses Hequired
			This BLANK	CONDUCT BARNS		•	ms/mso		REMARKS	Global ID #	EDD / EDF? YES NO	/ ' " (III) IV	Required QC Level?	

# **ADDITIONAL INSTRUCTIONS:**

Signature	Print Name	Company	Date	Time
Relinquished by	CHUSE BROWN	INSIGHT	Heg/,	1530
Received by	Anthon Stall	Alph. A. Grice	8/25/4	1570
Relinquished by	1, 0 1,	)	1,	7520
Received by On a forth (Icax	thizabeth Adcox	Toha	1 :	1023
Relinquished by	•		1	(
Received by				

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. 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 \*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

#### Phone Number City, State, Zip \_ Billing Information: Address Name \_ ADDITIONAL INSTRUCTIONS 150 City, State, Zip Address 3940 010 Client Name Relinquished by Sampled Sampled Received by Received by Relinquished by Relinquish Received by Time 1 8/25/)) Date 205 See Key Below Matrix\* Columbus Signature Sampled by KING Town Lab ID Number 3 CERALD TEMPKINS 20 Fax 92110 AUE C-205 Conner 10227 0, 90 \$ 0 NE, Z SZ JAM DugE-Report Attention DAVID CONNER Phone # (6/9) 726 - 7311 EMail Address P.O. # } ١ 287215 0 Sample Description 1 **Print Name** S Ø Sparks, Nevada 89431-5778 Alpha Analytical, Inc. 255 Glendale Avenue, Suite 21 Fax (775) 355-0406 Phone (775) 355-1044 Fax # 614 16/16. 11/200 = 15 500 F gor SURA TAT Op 6 257 S/VARIOUS 4/veries 15/may Total and type of S/VARIOUS 5 / VARIOUS \*\* See below 6614 containers / UHRLYOUS Samples Collected From Which State? 6 Company PERCHLORAGE 9 R Analyses Required OTHER Date DUPLICATE rever DUPLICATE Global ID# EDD / EDF? YES Page # Required QC Level? REMARKS K 25563 Ŵ, at ) 200 Time 2 š ₹

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.

\*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

Billing Information:	Alpha Analytical. Inc.	Samples Collected	) )
Name Dallelle Address 505 King Alie	255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778		OTHER Page # of
le, Zip Colymbus OH 4320 lumber 1019 7216-7311 Fax 1014 45	Phone (775) 355-1044 Fax (775) 355-0406		Analyses Required
Address David Conner	EMail Address (2000 / 10) hattell	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
City, State, Zip	Phone #6/9 726-73/1 Fax #6/		EDD / EDF? YES NO
See Key Sampled by D Loe	Report Attention David Conner	Total and type of O A A A A A A A A A A A A A A A A A A	Global ID #
Below Lab ID Number (Use Only)	Sample Description TAT	Field Filtere	REMARKS
08/3/25/L/Q	MW-13 10	3V MXXXX	
1100 25/1/A/Q - 12	MW-S 11	) 3ú, 2PXXX	
13578651/HQ	MW-10 11	D BV LPXXX	
ADDITIONAL INSTRUCTIONS: * (h	blocide Mitrate, White Ocho,	choselate, Sulfate	
	`		
Signature	Print Name	Company	Date Time
Relinquished by	Lavid Loera	Battelle	8-25-11 1430
Received by	CHASE BURGON	LNS1649	02811 11520
Relinquished by	CHAR BRODEN	ANS/ENT	8is/11 1570
Received by	Anthony STA	Africa Analytical	867/ 1530
Relinquished by		(, , , , , , , , , , , , , , , , , , ,	8hs/11 1770
A bella Lu	t liza both the	Hoha	11.972.8
"Key: AQ - Aqueous/ SO - Soil WA - Waste	e O1 - Other AH - Air **: L-Liter	V-Voa S-Soil Jar Q-Orbo T-Tedlar	B-Brass P-Plastic OT-Other

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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



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

Kandy Saulner

Walter Horiham

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

**David Conner** Attn:

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

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: MW-24-1					
Lab ID: BMI11083003-10A	Chloride	68	0.50 mg/L	08/30/I1 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: MW-16					
Lab ID: BMI11083003-15A	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.

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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: 08/30/11

Job:

100006114/JPL Groundwater Monitoring

#### Perchlorate by Ion Chromatography EPA Method 314.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-23-3 Lab ID: BMI11083003-02A Date Sampled 08/26/11 09:55	Perchlorate	1.19	1.00 μg/L	08/31/11 11:06	08/31/11 16:27
Client ID: <b>MW-23-2</b> Lab ID: BMI11083003-03A Date Sampled 08/26/11 10:16	Perchlorate	3.00	1.00 μg/L	08/31/11 11:06	08/31/11 17:22
Client ID: MW-23-1 Lab ID: BMII 1083003-04A Date Sampled 08/26/11 10:43	Perchlorate	9.66	1.00 μg/L	08/31/11 11:06	08/31/11 17:40
Client ID: <b>EB-04-8/26/11</b> Lab ID: BMI11083003-05A Date Sampled 08/26/11 10:33	Perchlorate	ND	1.00 μg/L	08/31/11 11:06	08/31/11 17:59
Client ID: MW-24-3 Lab ID: BMI11083003-08A Date Sampled 08/29/11 10:20	Perchlorate	ND	1.00 μg/L	08/31/11 11:06	08/31/11 18:17
Client ID: MW-24-2 Lab ID: BMI11083003-09A Date Sampled 08/29/11 10:45	Perchlorate	33.0	1.00 μg/L	08/31/11 11:06	08/31/11 18:35
Client ID: MW-24-1 Lab ID: BMII 1083003-10A Date Sampled 08/29/11 11:11	Perchlorate	. 12.2	1.00 μg/L	08/31/11 11:06	08/31/11 18:54
Client ID: <b>EB-05-8/29/11</b> Lab ID: BMI11083003-11A Date Sampled 08/29/11 10:59	Perchlorate	ND	1.00 μg/L	08/31/11 11:06	08/31/11 19:12
Client ID: <b>MW-6</b> Lab ID: BMI11083003-13A Date Sampled 08/29/11 09:49	Perchlorate	2.56	1.00 μg/L	08/31/11 11:06	08/31/11 19:31
Client ID: <b>DUPE-7-3Q11</b> Lab ID: BMI11083003-14A Date Sampled 08/29/11 09:55	Perchlorate	2.23	1.00 μg/L	08/31/11 11:06	08/31/11 19:49
Client ID: MW-16 Lab ID: BMI11083003-15A Date Sampled 08/29/11 12:40	Perchlorate	2.48	1.00 μg/L	08/31/11 11:06	08/31/11 20:08



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ND = Not Detected

Roger Scholl Kandy Soulman Walter 4

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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9/12/11

**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641 Date Received: 08/30/11

100006114/JPL Groundwater Monitoring

# Metals by ICPMS EPA Method 200.8

		21111110000000			
	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-23-4 Lab ID: BMI11083003-01A Date Sampled 08/26/11 09:33	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:22
Client ID: MW-23-3 Lab ID: BMI11083003-02A Date Sampled 08/26/11 09:55	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:28
Client ID: MW-23-2 Lab ID: BMI11083003-03A Date Sampled 08/26/11 10:16	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:34
Client ID: MW-23-1 Lab ID: BMI11083003-04A Date Sampled 08/26/11 10:43	Chromium (Cr)	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: BMI11083003-05A Date Sampled 08/26/11 10:33	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:40
Client ID: <b>MW-24-4</b> Lab ID: BMI11083003-07A Date Sampled 08/29/11 09:58	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:46
Client ID: <b>MW-24-3</b> Lab ID: BMI11083003-08A Date Sampled 08/29/11 10:20	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:52
Client ID: <b>MW-24-2</b> Lab ID: BMI11083003-09A Date Sampled 08/29/11 10:45	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 20:58
Client ID: MW-24-1 Lab ID: BMI11083003-10A Date Sampled 08/29/11 11:11	Chromium (Cr)	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: BMI11083003-11A Date Sampled 08/29/11 10:59	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:33
Client ID: <b>MW-6</b> Lab ID: BMI11083003-13A Date Sampled 08/29/11 09:49	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:39



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Client ID: <b>DUPE-7-3Q11</b> Lab ID: BMI11083003-14A Date Sampled 08/29/11 09:55	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:45
Client ID: MW-16  Lab ID: BMI11083003-15A  Date Sampled 08/29/11 12:40	Chromium (Cr)	0.0051	0.0050 mg/L	09/02/11 18:05	09/06/11 21:51
Client ID: MW-15 Lab ID: BMII 1083003-16A Date Sampled 08/29/11 14:28	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 21:57

ND = Not Detected

Roger Scholl

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.

9/2/11 **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

	ompounds - Volatile Organics by GC/MS				
	Estimated				
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID: MW-23-3 Lab ID: BMI11083003-02A Date Received: 08/30/11 Date Sampled: 08/26/11 09:55	*** None Found ***	ND	2.0 μg/L	09/02/11 13:58	09/02/11 13:58
Client ID: MW-23-2 Lab ID: BMI11083003-03A Date Received: 08/30/11 Date Sampled: 08/26/11 10:16	* * * None Found * * *	ND	2.0 μg/L	09/02/11 14:19	09/02/11 14:19
Client ID: MW-23-1 Lab ID: BMI11083003-04A Date Received: 08/30/11 Date Sampled: 08/26/11 10:43	* * * None Found * * *	ND	2.0 μg/L <sub>.</sub>	09/02/11 14:41	09/02/11 14:41
Client ID: EB-04-8/26/11 Lab ID: BM111083003-05A Date Received: 08/30/11 Date Sampled: 08/26/11 10:33	* * * None Found * * *	ND	2.0 μg/L	09/02/11 12:31	09/02/11 12:31
Client ID: TB-04-8/26/11 Lab ID: BMI11083003-06A Date Received: 08/30/11 Date Sampled: 08/26/11 08:00	* * * None Found * * *	ND	2.0 μg/L	09/02/11 12:53	09/02/11 12:53
Client ID: MW-24-3 Lab ID: BMI11083003-08A Date Received: 08/30/11 Date Sampled: 08/29/11 10:20	*** None Found ***	ND	2.0 μg/L	09/02/11 15:02	09/02/11 15:02
Client ID: MW-24-2 Lab ID: BMII 1083003-09A Date Received: 08/30/11 Date Sampled: 08/29/11 10:45	* * * None Found * * *	ND	2.0 μg/L	09/02/11 15:24	09/02/11 15:24
Client ID: MW-24-1 Lab ID: BMI11083003-10A Date Received: 08/30/11 Date Sampled: 08/29/11 11:11	Sulfur dioxide	4.5	2.0 μg/L	09/02/11 15:45	09/02/11 15:45
Client ID: EB-05-8/29/11 Lab ID: BMI11083003-11A Date Received: 08/30/11 Date Sampled: 08/29/11 10:59	*** None Found ***	ND	2.0 μg/L	09/02/11 13:15	09/02/11 13:15



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Client ID: TB-05-8/29/11 Lab ID: BMI11083003-12A Date Received: 08/30/11 Date Sampled: 08/29/11 07:45	*** None Found ***	ND	2.0 μg/L	09/02/11 13:36 09/02/11 13:36
Client ID: MW-6 Lab ID: BMII 1083003-13A  Date Received: 08/30/11  Date Sampled: 08/29/11 09:49	* * * None Found * * *	ND	2.0 μg/L	09/02/11 16:07 09/02/11 16:07
Client ID : <b>DUPE-7-3Q11</b> Lab ID : BMI11083003-14A  Date Received : 08/30/11  Date Sampled : 08/29/11 09:55	*** None Found ***	ND	2.0 μg/L	09/02/11 16:28 09/02/11 16:28
Client ID: MW-16 Lab ID: BMI11083003-15A Date Received: 08/30/11 Date Sampled: 08/29/11 12:40	*** None Found ***	ND	2.0 μg/L	09/02/11 16:50 09/02/11 16:50

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Toger Scholl Kandy Saulur

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager

• Walter Hinchman, Quality Assurance Office

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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.

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

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

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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	R	eporting	Limit		Compound	Concentration	Reporting L	imit
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	μα/L	52	1,2,4-Trimethylbenzene	ND	0.50	μg/L
18	1,2-Dichloroethane	ND		0.50	μg/L	53	sec-Butvlbenzene	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 (DBCI	P) 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					
~ 4				,						

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

35 Tetrachloroethene

Roger Scholl Kunder Soulans

Walter Firehour

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μg/L

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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.



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Attn: Phone:

**David Conner** (619) 726-7311

Fax:

(614) 458-6641

Job:

100006114/JPL Groundwater Monitoring

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	R	eporting	Limit		Compound	Concentration	Reporting L	imit
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	Chioroform	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 (DBCl	P) 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			, ,,	(.5 700)	
33	Dibromochloromethane	ND		0.50	μg/L					

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

ND

0.87

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

1,2-Dibromoethane (EDB)

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μg/L

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. **Report Date** 

Page 1 of 1



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job: 100006114/ID

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-04A

Client I.D. Number: MW-23-1

Attn: David Conner

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

> 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	R	eporting	Limit		Compound	Concentration	Reporting Li	imit
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-Chiorotoluene	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 (DBC	P) 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	86	(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	μg/L					
33	Dibromochloromethane	ND		0.50	μg/L					

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

1,2-Dibromoethane (EDB)

ND = Not Detected

35 Tetrachloroethene

Roger Scholl Kundge Soulur

Walter Hirihan

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

μg/L

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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Attn: Phone: Fax:

David Conner (619) 726-7311 (614) 458-6641

100006114/JPL Groundwater Monitoring

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	R	eporting	Limit		Compound	Concentration	Reporting Li	imit
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 (DBC	P) 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					

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

ND

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

35 Tetrachloroethene

Roger Scholl

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

μg/L

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

100006114/JPL Groundwater Monitoring

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

David Conner

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

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	ı	Reporting	Limit		Compound	Concentration	Reporting L	imit
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-Xvlene	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-Chiorotoluene	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 (DBC)	P) 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					

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

35 Tetrachioroethene

Koger Scholl

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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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-08A

Client I.D. Number: MW-24-3

Attn: David Conner

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

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	R	eporting l	Limit		Compound	Concentration	Reporting Li	imit
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 (DBC	P) 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-Dichloroproparie	ND		0.50	μg/L					
33	Dibromochloromethane	ND		0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND		1.0	μg/L					

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl Kandy Sanlur

Walter Hirehour

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

Page 1 of 1

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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-09A

Client I.D. Number: MW-24-2

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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	R	eporting I	Limit		Compound	Concentration	Reporting Li	imit
1	Dichlorodifluoromethane	ND	Q	0.50	μg/L	36	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	0.68		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-Isopropyitoluene	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 (DBCI	P) 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					

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

ND

ND

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

33 Dibromochloromethane

Tetrachioroethene

1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soula

Walter Hindrey

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µg/L

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

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*9*/12/11



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-10A

Client I.D. Number: MW-24-1

David Conner Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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	R	Reporting I	Limit		Compound	Concentration	Reporting Li	imit
1	Dichlorodifluoromethane	ND	Q	0.50	µg/L	36	1,1,1,2-Tetrachioroethane	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-Chiorotoluene	ND	0.50	μg/L
14	cis-1,2-Dichloroethene	ND		0.50	μg/L	49	2-Chlorotoluene	ND	0.50	μg/L
15	Bromochioromethane	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 (DBC)	P) ND	2.5	μg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichiorobenzene	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					
2.4	4.0 Diberes 4-46 (EDD)	l								

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

1,2-Dibromoethane (EDB)

ND = Not Detected

35 Tetrachloroethene

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

1.0

µg/L

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.

**Report Date** 

Page 1 of 1



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### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101 Fax:

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

100006114/JPL Groundwater Monitoring

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	R	eporting	Limit		Compound	Concentration	Reporting L	imit
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 ND		0.50	µg/L	41	Styrene	ND	0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xvlene	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-Propvibenzene	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-Butvlbenzene	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 (DBC	P) 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)	
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	. •		ŧ	,	
33	Dibromochloromethane	ND		0.50	μg/L					
		1		-						

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

ND

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

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

**David Conner** Phone: (619) 726-7311

Fax:

(614) 458-6641

100006114/JPL Groundwater Monitoring

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	R	eporting	Limit		Compound	Concentration	Reporting L	imit
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	Ethylbenzerie	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 (DBC	P) 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-Trichtorobenzene	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					

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

ND

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

1,2-Dibromoethane (EDB)

ND = Not Detected

35 Tetrachioroethene

Roger Scholl

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.

**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.



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-13A

Client I.D. Number: MW-6

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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		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	μ <b>g</b> /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 (DBC	P) 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					

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

33 Dibromochloromethane

Tetrachloroethene

1,2-Dibromoethane (EDB)

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μg/L

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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.



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### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

**David Conner** 

Phone: Fax:

(619) 726-7311 (614) 458-6641

100006114/JPL Groundwater Monitoring

Sampled: 08/29/11 09:55

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

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	F	Reporting I	Limit		Compound	Concentration	Reporting Li	mit
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-Trichioroethane	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 (DBCI	P) 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					

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

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

33 Dibromochloromethane

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

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μg/L

µg/L

1.0

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

Client I.D. Number: MW-16

655 West Broadway San Diego, CA 92101

Phone: Fax:

Attn:

David Conner (619) 726-7311 (614) 458-6641

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083003-15A

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	R	eporting	Limit		Compound	Concentration	Reporting L	imit
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 (DBC	P) 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			1	, ,	
33	Dibromochloromethane	5.8		0.50	μg/L					
		1								

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

ND

ND

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

35 Tetrachloroethene

Roger Scholl

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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.



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### **VOC Sample Preservation Report**

Work Order: BMI11083003 Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН	
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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<b>Date:</b> 02-Sep-11	(	QC Summary Report							<b>Work Order:</b> 11083003		
Method Blank File ID: 48		Туре: <b>МЕ</b>		est Code: EP		hod 300.0	Analys	sis Date:	08/30/2011 20:09		
Sample ID: MB-27215	Units : mg/L	F	Run ID: IC	1_110830B	1		Prep [	Date:	08/30/2011 13:43		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %RPD(Limit)	Qual	
Chloride	ND	0.5									
Nitrite (NO2) - N Nitrate (NO3) - N	ND ND	0.25 0.25									
Phosphate, ortho - P	ND	0.23									
Sulfate (SO4)	ND	0.5									
Laboratory Fortified Blan	k	Type: LF	В Те	st Code: EF	A Meti	hod 300.0					
File ID: 49			Ba	tch ID: 2721	5		Analys	sis Date:	08/30/2011 20:29		
Sample ID: LFB-27215	Units : <b>mg/L</b>	, F	_	_1_110830B			Prep [		08/30/2011 13:43		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %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 Sulfate (SO4)	5.08 99.3	0.5 0.5	5 100		102 99	90 90	110 110				
Sample Matrix Spike		Type: LF	M Te	est Code: EF	A Met	hod 300.0					
File ID: 52		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		tch ID: 2721			Analys	sis Date:	08/30/2011 21:24		
Sample ID: 11083003-10Al	LFM Units : mg/L	. F	Run ID: IC	1_110830B	;		Prep [	Date:	08/30/2011 13:43		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef\	/al %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 Phosphate, ortho - P	11.7 12.2	0.25	10	1.183	106 122	80	120 120			M1	
Sulfate (SO4)	239	0.5 0.5	10 200	0 45.88	96	80 80	120			IVI	
· · · · · · · · · · · · · · · · · · ·		Type: LF		est Code: EF			120				
Sample Matrix Spike Dup	ncate	Type. LF		itch ID: 2721		1100 300.0	Analy	sis Date	08/30/2011 21:42		
Sample ID: 11083003-10Al	LFMD Units : mg/L			1 110830E			Prep [		08/30/2011 13:43		
Analyte	Result	. PQL	-			LCL(ME)	•		/al %RPD(Limit)	Qual	
Chloride	164	0.5	100	68.2	95	80	120	164.1	· · · · · · · · · · · · · · · · · · ·		
Nitrite (NO2) - N	10.4	0.25	10	00.2	104	80	120	10.58	( - /		
Nitrate (NO3) - N	11.6	0.25	10	1.183	104	80	120	11.73			
Phosphate, ortho - P	11.3	0.5	10	0	113	80	120	12.19			
Sulfate (SO4)	237	0.5	200	45.88	96	80	120	238.6	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.



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<b>Date:</b> 06-Sep-11	QC Summary Report							Work Order: 11083003		
Method Blan	nk		Type: N		est Code: El atch ID: 272		hod 314.0	Analysis Date:	: 08/31/2011 12:09	_
Sample ID:	MB-27222	Units : µg/L		Run ID: IC	_3_110831	4		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		ND	•	1						
Laboratory	Fortified Blank		Type: L	.FB T	est Code: El	PA Met	thod 314.0			
File ID: 15				В	atch ID: 272	22		Analysis Date:	08/31/2011 12:27	
Sample ID:	LFB-27222	Units : µg/L		Run ID: IC	_3_110831	4		Prep Date:	08/31/2011 11:06	
Analyte	_	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		24.3	:	2 25		97	85	115		
Sample Mat	rix Spike		Type: L	.FM T	est Code: El	PA Met	thod 314.0			
File ID: <b>21</b>				В	atch ID: 272	22		Analysis Date:	08/31/2011 14:18	
Sample ID:	11082403-04ALFM	Units : µg/L		Run ID: IC	_3_110831	4		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		26.4		2 25	4.997	86	80	120		
Sample Mat	rix Spike Duplicate		Type: L	FMD T	est Code: El	PA Met	thod 314.0			
File ID: 22				В	atch ID: 272	22		Analysis Date:	08/31/2011 14:36	
Sample ID:	11082403-04ALFMD	Units : µg/L		Run ID: IC	_3_110831	4		Prep Date:	08/31/2011 11:06	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Perchlorate		27.1	2	2 25	4.997	89	80	120 26.4	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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<b>Date:</b> 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) RPDRef	Val %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 Analyte	Units: mg/L Run ID: ICP/MS_110906D Prep Date:  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRef	09/02/2011 18:05  (Val %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) RPDRef	fVal %RPD(Limit) Qual	
Chromium (Cr)	0.0563		
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) RPDRef	fVal %RPD(Limit) Qual	
Chromium (Cr)	0.0559 0.005 0.05 0.007226 97 70 130 0.056	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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<b>Date:</b> 12-Sep-11		<b>Work Order:</b> 11083003			
Method Blank		Type: MBLK	Test Code: EPA Method SW8	260B	
File ID: <b>11090206.D</b>			Batch ID: MS15W0902M	Analysis Date: 09/02/2	2011 10:22
Sample ID: MBLK M\$15W0902M	Units : µg/L	Run II	D: MSD_15_110902B	Prep Date: 09/02/2	2011 10:22
Analyte	Result	PQL Spk	Val SpkRefVal %REC LCL(ME	) UCL(ME) RPDRefVal %RI	PD(Limit) Qua
Dichlorodifluoromethane	ND	0.5			
Chloromethane	ND	1			
Vinyl chloride	ND	0.5			
Chloroethane Bromomethane	ND ND	0.5 1			
Trichlorofluoromethane	ND ND	0.5			
1,1-Dichloroethene	ND	0.5			
Dichloromethane	ND	1			
Freon-113	ND	0.5			
trans-1,2-Dichloroethene Methyl tert-butyl ether (MTBE)	ND	0.5			
1,1-Dichloroethane	ND ND	0.5 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 1,2-Dichloroethane	ND ND	0.5 0.5			
1,1,1-Trichloroethane	ND ND	0.5 0.5			
1,1-Dichloropropene	ND	0.5			
Carbon tetrachloride	ND	0.5	•		
Benzene	ND	0.5			
Dibromomethane 1,2-Dichloropropane	ND	0.5			
Trichloroethene	ND ND	0.5 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 Toluene	ND ND	0.5			
1,3-Dichloropropane	ND ND	0.5 0.5			
Dibromochloromethane	ND	0.5			
1,2-Dibromoethane (EDB)	ND	1			
Tetrachloroethene	ND	0.5			
1,1,1,2-Tetrachloroethane Chlorobenzene	ND	0.5			
Ethylbenzene	ND ND	0.5 0.5			
m,p-Xylene	ND ND	0.5			
Bromoform	ND	0.5			
Styrene	ND	0.5			
o-Xylene	ND	0.5			
1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane	ND ND	0.5			
Isopropylbenzene	ND ND	1 0.5			
Bromobenzene	ND	0.5			
n-Propylbenzene	ND	0.5			
4-Chlorotoluene	ND	0.5			
2-Chlorotoluene 1,3,5-Trimethylbenzene	ND	0.5			
tert-Butylbenzene	ND ND	0.5 0.5			
1,2,4-Trimethylbenzene	ND ND	0.5			
sec-Butylbenzene	ND	0.5			
1,3-Dichlorobenzene	ND	0.5			
1,4-Dichlorobenzene	ND	0.5			
4-Isopropyltoluene 1,2-Dichlorobenzene	ND ND	0.5			
n-Butylbenzene	ND ND	0.5 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 Surr: 1,2-Dichloroethane-d4	ND 10.6	1	10 100 70	130	
Surr: Toluene-d8	9.81		10 106 70 10 98 70	130	
Julia i Oldono-do	9.81		10 90 /0	130	



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Date: _12-Sep-11	QC	Summary Re	port			Work Order: 11083003
Surr: 4-Bromofluorobenzene	9	10	90	70	130	



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<b>Date:</b> 12-Sep-11	QC Summary Report							Work Order: 11083003	
Laboratory Control Spike		Type: L							
File ID: <b>11090204.D</b>			В	atch ID: MS15W090	2M	Analysis Da	ate: 09/02/2011 09:27	,	
Sample ID: LCS MS15W0902M	Units : µg/L		Run ID: M	SD_15_110902B		Prep Date:	09/02/2011 09:27	,	
Analyte	Result	PQL			LCL(ME)	•	RefVal %RPD(Limit)	Qua	
Dichlorodifluoromethane	6.37				70(70)	130	,	L50	
Chloromethane						130		LUU	
Vinyl chloride	9.31 8.53		2 10 1 10	93 85	70 70	130			
Chloroethane	10.2		1 10	102	70	130			
Bromomethane	6.32		2 10		70(70)	130		L50	
Trichlorofluoromethane	10.2		1 10	102	70	130			
1,1-Dichloroethene	8.36		1 10		70	130			
Dichloromethane	8.48	:	2 10		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.		94	70	130			
1,1-Dichloroethane	8.75		1 10	88	70 70	130			
2-Butanone (MEK) cis-1,2-Dichloroethene	243	10			70 70	130			
Bromochloromethane	8.81 9.2		1 10 1 10	88 92	70 70	130 130			
Chloroform	9.2 9.14		1 10		70 70	130			
2,2-Dichloropropane	8.82		1 10	88	70	130			
1,2-Dichloroethane	9.6		1 10		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	0.9			70	130			
Dibromomethane 1,2-Dichloropropane	9.38		1 10	94	70 70	130			
Trichloroethene	8.66		1 10	87	70 70	130 130			
Bromodichloromethane	8.91 8.96		1 10 1 10	89 90	70 70	130			
4-Methyl-2-pentanone (MIBK)	26.3	2.			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	0.9		87	70	130			
1,3-Dichloropropane	8.75		1 10	88	70	130			
Dibromochloromethane 1,2-Dibromoethane (EDB)	7.8		1 10	78	70	130			
Tetrachloroethene	17.8 8.68		2 20 1 10	89 87	70 70	130 130			
1,1,1,2-Tetrachloroethane	8.79		1 10 1 10	88	70 70	130			
Chlorobenzene	8.59		1 10	86	70	130			
Ethylbenzene	9.31	0.5		93	70	130			
m,p-Xylene	9.11	0.	5 10		70	130			
Bromoform	7.75		1 10	78	70	130			
Styrene	7.81		1 10		70	130			
o-Xylene	9.07	0.9		91	70	130			
1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane	8.5		1 10	85	70	130			
i,z,s-i nchloropropane Isopropylbenzene	18.3		2 20		70 70	130			
Bromobenzene	8.21 8.55		1 10 1 10	82 86	70 70	130 130			
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		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 1,4-Dichlorobenzene	8.83		1 10	88	70 70	130			
1,4-Dichiorobenzene 4-Isopropyltoluene	8.18 8.73		1 10	82 87	70 70	130			
1,2-Dichlorobenzene	8.73 8.17		1 10 1 10	87 82	70 70	130 130			
n-Butylbenzene	8.91		1 10	82 89	70 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			



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<b>Date:</b> 12-Sep-11	III NIMMORU RANORI					
Surr: Toluene-d8	9.51	10	95	70	130	
Surr: 4-Bromofluorobenzene	9.15	10	92	70	130	



Surr: Toluene-d8

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Date:

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Work Order:

QC Summary Report 12-Sep-11 11083003 Type: MSD Test Code: EPA Method SW8260B Sample Matrix Spike Duplicate 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 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 21 52.3 50 0 105 159 47.94 8.8(40) 2.5 **Bromomethane** 38.4 10 50 0 10 174 31.6 19.4(40) 77 Trichlorofluoromethane 2.5 54.8 50 0 110 32 154 53.19 3.0(37)1,1-Dichloroethene 64 41.02 42.9 2.5 50 0 86 130 4.6(21)Dichloromethane 3.8(20) 42.8 10 50 0 86 69 130 41.25 Freon-113 0 48.3 2.5 50 97 55 141 45.94 5.1(40)trans-1,2-Dichloroethene 44.8 2.5 0 90 63 130 42.9 4.3(20)50 Methyl tert-butyl ether (MTBE) 0 95 47 44.81 5.9(40) 47.5 1.3 50 150 1.1-Dichloroethane 2.5 0 90 42.97 4.9(20)45.1 50 66 130 2-Butanone (MEK) 860 0 817.5 5.0(22)50 1000 86 23 182 cis-1,2-Dichloroethene 45.5 0 70 42.05 7.9(20)2.5 50 91 130 Bromochloromethane 47.5 2.5 50 0 95 70 132 45.38 4.5(20)Chloroform 54.6 88 92 70 130 52.78 3.4(20) 2.5 50 2,2-Dichloropropane 45.9 92 38 43.08 6.3(22)50 0 154 1,2-Dichloroethane 48.4 0 97 65 46.54 3.9(20)2.5 50 134 1,1,1-Trichloroethane 47.4 2.5 0 95 65 136 44.51 6.3(20)50 1.1-Dichloropropene 48.1 0 96 68 132 45.55 5.3(20) 50 Carbon tetrachloride 0 46.5 2.5 50 93 58 148 43.66 6.2(20)Benzene 46.2 1.3 50 0 92 59 138 43.88 5.2(21)Dibromomethane 0 70 48.1 2.5 50 96 130 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) 0 20 182 125 99.7 116.6 6.6(20)13 125 cis-1,3-Dichloropropene 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 0 95 70 44.97 5.0(20)50 131 Toluene 44.8 1.3 50 0 90 130 43.01 4.1(20)1,3-Dichloropropane 44.5 2.5 0 89 70 42.16 5.5(20) 50 130 Dibromochloromethane 46.5 2.5 5.82 81 42 155 44.29 4.8(20)50 1.2-Dibromoethane (EDB) 91.2 5 91 70 130 86.46 5.3(20)100 0 Tetrachloroethene 2.5 90 42.83 45 0 65 130 4.9(20)50 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 0 96 45.63 1.3 50 68 130 4.8(20)m,p-Xylene 46.8 0 94 68 4.8(20) 1.3 50 131 44.61 **Bromoform** 43.7 2.5 50 2.62 82 65 143 40.66 7.3(20)Styrene 6.0(37) 40.4 0 81 38.07 2.5 59 153 50 o-Xvlene 44.21 6.0(20)47 1.3 50 0 94 70 130 1,1,2,2-Tetrachloroethane 41.39 0 86 43 2.5 50 67 130 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 0 90 70 130 42.58 5.4(20)50 n-Propylbenzene 44.9 2.5 50 0 90 67 133 42.35 5.9(30) 4-Chlorotoluene 42.8 2.5 0 86 70 130 40.55 5.5(20) 50 2-Chlorotoluene 42.8 2.5 0 50 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-Butvlbenzene 44.8 2.5 50 0 90 55 147 42.44 5.3(20)1,2,4-Trimethylbenzene 46 2 2.5 0 92 65 43.91 50 135 5.1(25) sec-Butylbenzene 44.5 0 2.5 50 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 0 130 41.04 5.2(20) 2.5 86 70 50 4-Isopropyltoluene 46.2 50 0 92 68 132 43.78 5.4(20) 1,2-Dichlorobenzene 42.9 2.5 0 86 70 50 130 40.76 5.1(20)n-Butylbenzene 47.8 2.5 0 96 134 45.52 5.0(21)50 62 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 0 85 62 40.47 5.0(29) 50 133 Naphthalene 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 89 55 138 41.93 5.9(36) 50 Surr: 1,2-Dichloroethane-d4 52.8 50 106 70 130 Surr: Toluene-d8 47.5 95 70 130



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

<b>Date:</b> _12-Sep-11	QC	<b>Work Order:</b> 11083003				
Surr: 4-Bromofluorobenzene	45.9	50	92	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. 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

Report Attention TEL: (775) 355-1044 FAX: (775) 355-0406 Phone Number EMail Address

Client

Battelle Memorial Institute

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

EDD Required: Yes

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

WorkOrder: BMIS11083003

Page: 1 of 2

Sampled by: Chase Brogdon, D. Loera

Cooler Temp Samples Received 30-Aug-2011

30-Aug-2011

QC Level: DS4 Client's COC #: 25571, 024297 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates Job: 100006114/JPL Groundwater Monitoring

PO: 287215

San Diego, CA 92101

Suite 1420 655 West Broadway

BMI11083003-10A MW-24-1 BMI11083003-09A MW-24-2 BMI11083003-08A BMI11083003-07A MW-24-4 BMI11083003-05A EB-04-8/26/11 BMI11083003-02A MW-23-3 Sample ID BMI11083003-06A BMI11083003-04A MW-23-1 BMI11083003-03A MW-23-2 BMI11083003-01A MW-23-4 MW-24-3 TB-04-8/26/11 Client Sample ID å Š ğ ģ ð ğ ğ å Matrix Date å AQ 08/26/11 09:33 08/29/11 11:11 08/29/11 10:45 08/26/11 09:55 08/26/11 10:33 08/26/11 10:43 08/26/11 10:16 08/29/11 10:20 08/29/11 09:58 08/26/11 08:00 Collection No. of Bottles Alpha Sub G 5 S G G G G 0 0 0 0 0 0 0 0 0 0 ΤAΤ 9 9 9 9 9 9 ဖ ဖ 9 9 NO2, NO3, Perchlorate PO4, SO4, Cl 300\_0\_W Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ Ç Ω ť ť VOC by 524 VOC by 524 Criteria Criteria Requested Tests VOC\_W Reno Trip Blank 4/6/11 Sample Remarks Level IV QC Level IV QC

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: Indiath Xecord Elizabeth **Print Name** Tacex Alpha Analytical, Inc. Company 8:30-11 11:33 Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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 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. 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

Report Attention David Conner Phone Number (619) 726-7311 x connerd@battelle.org EMail Address

(614) 424-4899 (614) 424-4117 x

waltons@battelle.org cutiee@batelle.org Battelle Memorial Institute

655 West Broadway

Suite 1420

San Diego, CA 92101

Shane Walton Betsy Cutie

Sample ID

QC Level: DS4

Page: 2 of 2

WorkOrder: BMIS11083003

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

EDD Required: Yes

Sampled by: Chase Brogdon, D. Loera

Cooler Temp Samples Received

Client's COC #: 25571, 024297 BMI11083003-16A MW-15 BMI11083003-15A MW-16 BMI11083003-13A MW-6 BMI11083003-12A TB-05-8/29/11 BMI11083003-11A EB-05-8/29/11 BMI11083003-14A DUPE-7-3Q11 Client Sample ID = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates Job: 100006114/JPL Groundwater Monitoring å ğ Matrix Date Š ğ Š AQ 08/29/11 10:59 08/29/11 09:49 08/29/11 07:45 08/29/11 14:28 08/29/11 09:55 Collection No. of Bottles 08/29/11 12:40 Alpha თ თ N 2 G Sub 0 0 0 0 0 0 ΤAT ဖ ဖ 9 ဖ 9 NO2, NO3, PO4, SO4, CI 300\_0\_W Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ Ç Ç Ç Ç Ç VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524
Criteria Criteria VOC by 524 Requested Tests Criteria VOC by 524 Criteria VOC\_W 0 က 30-Aug-2011 MS/MSD on all analyses Reno Trip Blank 4/6/11 Sample Remarks except Anions. MS/MSD 30-Aug-2011

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:	
, Lucex	ignature
Elizabeth + aco	Print Name
Aipna Analytical, inc.	Company
8 00.1	Date/Time

Alpha Alpha	J	amples Collected From Which	h State? 25571
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OT - Other AR - Air **: L- eported unless other arrangements are mad-	Liter V-Voa S-Soil Jar e. Hazardous samples will be retur	O-Orbo T-Tedlar B-Brass ned to client or disposed of at client exp	P-Plastic OT-Other pense. The report for the analysis
OT - Other AR - Air **: L- eported unless other arrangements are made	Liter V-Voa S-Soil Jar e. Hazardous samples will be retur	O-Orbo T-Tedlar B-Brass ned to client or disposed of at client exp	P-Plastic OT-Other pense. The report for the analysis
	Alphay  King Aug  WS OH 43201  Fax  Aurib Conner Pont  Fax  Aurib Conner Pont  Fax  April Pont  Fax  Phone (100 Phone from 67)  WE Broad Of Marin Address  And Arrib Conner Pont  Broad Address  And Arrib Conner Pont  Broad Address  And Arrib Conner Pont  Broad Address  And Arrib Conner Pont  Fax (775)  Fax (	Alpha Analytical, Inc. 255 Glendale Avenue, Sulte 21 250 Glendale	Alpha Analytical, Inc. 255 Clinedida Awanus, Side 21  AZ CAX NV W  AZ

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.

Received by	Received by Comp. Dath (IN DAX) Relinquished by	Relinquished by	Received by	Relinquished	Signature	ADDITIONAL INSTRUCTIONS:			2 - 3 Day 1845 SHA	11 - De 1/42/8 650	Apply 4	60.			Below	Matrix Souppedby 3000	DIEGO CIA	Address 3990 BID TOWN AVE. C-205	Client Name / CONNET	hone Number Fax	te, Zip Columbus OH	ddress 505 King Aug	ng Information:	
OT Other AB Air **   132-	Elizabeth Holcox	11 0 11	Anthony Stack	CHUSE BILOGNON	Print Name				178-8-8/29/11	c8-05-8/29/11	12- mm	3,2	Me - 24 - 3	mw - 24 - 4	Φ	MAVID CONNER	Phope #(4)	EMail Address CONNER D @ BATTE	PO# 287215 Job#	i an (170) 000 044	H3201 Phone (775) 355-1044	255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778	П	
Wiles College O Orbo T Teller B Broom	Hipha	2.2	Axul	The sec thisky	Company				X	8020 X X X		S- various XXX	2	1-poly X	Filtered ** See below	Total and type of	128-6614 ASH	21/200	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )			nue, Suite 21  9431-5778    ID OR OTHER	Samples Collected	
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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.

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

Billing Information:	Alpha Analyi	Samples Collected	m Which State?
Name Battelle	255 Glendale Avenue, Suite 21	21 .	FR WA U Z \$ 2 9 /
Address SOS KING HIVE	Sparks, Nevada 89431-5778 Phone (775) 355-1044		rage #
Phone Number (al 9 726-7311 Fax (al 4 4)	(X 64)	Analyses Required	equired /
Client Name David Conner	Po.# 287215 Job#	1 E & K. 1 H19000C	Required QC Level?
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City, State, Zip	73	R R R R 1199-851-1	EDD/EDF? YESNO
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CANONIA AG	3 MW-6 10	3 <i>V_2p</i>  X X X	
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ADDITIONAL INSTRUCTIONS: * (	hlocide, Vitate, Mitrite, Ochor	shosphate, Sulfate	
Signature	Print Name	Company	Date Time
Relinquished by Muth R	David Look	Battelle	8-29-11 1450
Received by	Brie	INSURCES	8/29/11 1450
Relinquished by	CHESE BUSTON	JAH 18MI	1/4/11 1500
Received by	Anthony Star	Alpha Analytical	8/29/4 1500
Relinquished by		1, 4	8/19/11 1500
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*Key: AQ - Aqueous ↓ SO - Soil WA - Waste	aste OT - Other AR - Air **: L-Liter	V-Voa S-Soil Jar V O-Orbo T-Tedlar E	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.



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 11083104-07A	EPA Method 314.0 EPA Method 314.0	Perchlorate 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

Kandy Saulmer

Walter Firehour



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: 08/31/11

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: BMI11083104-01A Date Sampled 08/30/11 10:41	Perchlorate	ND	1.00 μg/L	09/06/11 11:51	09/06/11 13:43
Client ID: MW-3-3 Lab ID: BMI11083104-02A Date Sampled 08/30/11 11:02	Perchlorate	ND	1.00 μg/L	09/06/11 11:51	09/06/11 14:01
Client ID: MW-3-2 Lab ID: BMI11083104-03A Date Sampled 08/30/11 11:27	Perchlorate	3.00	1.00 μg/L	09/06/11 11:51	09/06/11 14:20
Client ID: <b>EB-06-8/30/11</b> Lab ID: BM111083104-04A Date Sampled 08/30/11 10:55	Perchlorate	ND	1.00 µg/L	09/06/11 11:51	09/06/11 14:38
Client ID: MW-4-3 Lab ID: BMI11083104-06A Date Sampled 08/30/11 08:43	Perchlorate	ND	1.00 μg/L	09/06/11 11:51	09/06/11 14:57
Client ID: MW-4-2 Lab ID: BMI11083104-07A Date Sampled 08/30/11 09:07	Perchlorate	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 Date Sampled 08/30/11 09:28	Perchlorate	ND	1.00 μg/L	09/06/11 11:51	09/06/11 15:33

ND = Not Detected

Roger Scholl

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.

ď 9/13/11



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: 08/31/11

Job:

100006114/JPL Groundwater Monitoring

Metals by ICPMS EPA Method 200.8

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-3-4</b> Lab ID: BMI11083104-01A Date Sampled 08/30/11 10:41	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:49
Client ID: MW-3-3 Lab ID: BMI11083104-02A Date Sampled 08/30/11 11:02	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:55
Client ID: MW-3-2 Lab ID: BMI11083104-03A Date Sampled 08/30/11 11:27	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:01
Client ID: <b>EB-06-8/30/11</b> Lab ID: BMI11083104-04A Date Sampled 08/30/11 10:55	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:07
Client ID: MW-4-3 Lab ID: BMI11083104-06A Date Sampled 08/30/11 08:43	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:13
Client ID: MW-4-2 Lab ID: BMI11083104-07A Date Sampled 08/30/11 09:07	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:19
Client ID: MW-4-1 Lab ID: BMI11083104-08A Date Sampled 08/30/11 09:28	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/06/11 23:26

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** 



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

(614) 458-6641 Fax:

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

			Estimated		
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID: MW-3-4 Lab ID: BMI11083104-01A Date Received: 08/31/11 Date Sampled: 08/30/11 10:41	*** None Found ***	ND	2.0 μ <b>g</b> /L	09/06/11 15:51	09/06/11 15:51
Client ID: MW-3-3 Lab ID: BMI11083104-02A Date Received: 08/31/11 Date Sampled: 08/30/11 11:02	* * * None Found * * *	ND	8.0 μg/L	09/06/11 16:12	09/06/11 16:12
Client ID: MW-3-2 Lab ID: BMI11083104-03A Date Received: 08/31/11 Date Sampled: 08/30/11 11:27	* * * None Found * * *	ND	2.0 μg/L	09/06/11 16:34	09/06/11 16:34
Client ID: EB-06-8/30/11 Lab ID: BMI11083104-04A Date Received: 08/31/11 Date Sampled: 08/30/11 10:55	* * * None Found * * *	ND	2.0 μ <b>g</b> /L	09/06/11 12:36	09/06/11 12:36
Client ID: TB-06-8/30/11 Lab ID: BM111083104-05A Date Received: 08/31/11 Date Sampled: 08/30/11 07:00	* * * None Found * * *	ND	2.0 μg/ί.	09/06/11 15:58	09/06/11 15:58
Client ID: MW-4-3 Lab ID: BMI11083104-06A Date Received: 08/31/11 Date Sampled: 08/30/11 08:43	* * * None Found * * *	ND	2.0 μg/L	09/06/11 16:55	09/06/11 16:55
Client ID: MW-4-2 Lab ID: BMI11083104-07A Date Received: 08/31/11 Date Sampled: 08/30/11 09:07	* * * None Found * * *	ND	2.0 μg/L	09/06/11 17:17	09/06/11 17:17
Client ID: MW-4-1 Lab ID: BMI11083104-08A Date Received: 08/31/11 Date Sampled: 08/30/11 09:28	* * * None Found * * *	ND	2.0 μg/L	09/06/11 17:39	09/06/11 17:39



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Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Kandy Soulan

Walter Findens

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

Page 1 of 1



Alpha Analytical Number: BMI11083104-01A

## Alpha Analytical, Inc.

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## ANALYTICAL REPORT

**Battelle Memorial Institute** 655 West Broadway

David Conner

San Diego, CA 92101

Phone: (619) 726-7311 (614) 458-6641

100006114/JPL Groundwater Monitoring

Client I.D. Number: MW-3-4

Fax:

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 L	imit
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 (DBCI	P) 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			1 -	,,	
33	Dibromochloromethane	ND	0.50	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA \bullet (916)\ 366-9089\ /\ Las\ Vegas,\ NV \bullet (702)\ 736-7522\ /\ Carson,\ CA \bullet (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

μg/L

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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## ANALYTICAL REPORT

Phone: (619) 726-7311

Attn:

Fax:

David Conner

(614) 458-6641

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

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

Dichlorodifluoromethane	2.0 2.0 2.0 2.0 2.0 2.0 2.0 4.0 2.0	<ul> <li>μg/L</li> </ul>
2         Chloromethane         ND         4.0         µg/L         37         Chlorobenzene         ND           3         Vinyl chloride         ND         2.0         µg/L         38         Ethylbenzene         ND           4         Chloroethane         ND         2.0         µg/L         38         Ethylbenzene         ND           5         Bromomethane         ND         4.0         µg/L         40         Bromoform         ND           6         Trichlorofluoromethane         ND         2.0         µg/L         41         Styrene         ND           7         1,1-Dichloroethene         ND         2.0         µg/L         42         o-Xylene         ND           8         Dichloroethane         ND         4.0         µg/L         43         1,2,2-Tetholoroethane         ND           9         Freon-113         ND         2.0         µg/L         44         1,2,3-Trichloropropane         ND           10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           11         Methyl tert-butyl ether (MTBE)         ND         2.0         µg/L         46         Bromobenzene	2.0 2.0 2.0 2.0 2.0 2.0 2.0 4.0 2.0	<ul> <li>μg/L</li> </ul>
3         Vinyl chloride         ND         2.0         µg/L         38         Ethylbenzene         ND           4         Chloroethane         ND         2.0         µg/L         39         m,p-Xylene         ND           5         Bromomethane         ND         4.0         µg/L         40         Bromoform         ND           6         Trichlorofluoromethane         ND         2.0         µg/L         41         Styrene         ND           7         1,1-Dichloroethene         ND         2.0         µg/L         42         o-Xylene         ND           8         Dichloromethane         ND         4.0         µg/L         43         1,1,2,2-Tetrachloroethane         ND           9         Freon-113         ND         2.0         µg/L         44         1,2,3-Trichloroephane         ND           10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           12         1,1-Dichloroethane         ND         2.0         µg/L         46         Bromobenzene         ND           13         2-Butanone (MEK)         ND         40         µg/L         48         4-Chlorotoluene	2.0 2.0 2.0 2.0 2.0 2.0 4.0 2.0	<ul> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> </ul>
4         Chloroethane         ND         2.0         μg/L         39         m,p-Xylene         ND           5         Bromomethane         ND         4.0         μg/L         40         Bromoform         ND           6         Trichlorofluoromethane         ND         2.0         μg/L         41         Styrene         ND           7         1,1-Dichloroethene         ND         2.0         μg/L         42         o-Xylene         ND           8         Dichloromethane         ND         4.0         μg/L         43         1,1,2,2-Tetrachloroethane         ND           9         Freon-113         ND         2.0         μg/L         44         1,2,3-Trichloropropane         ND           10         trans-1,2-Dichloroethene         ND         2.0         μg/L         45         Isoprophybenzene         ND           10         trans-1,2-Dichloroethane         ND         2.0         μg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         μg/L         47         n-Propybenzene         ND           13         2-Butanone (MEK)         ND         40         μg/L         48         4-Chlorotolue	2.0 2.0 2.0 2.0 4.0 2.0	<ul> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> <li>μg/L</li> </ul>
5         Bromomethane         ND         4.0         µg/L         40         Bromform         ND           6         Trichlorofluoromethane         ND         2.0         µg/L         41         Styrene         ND           7         1,1-Dichloroethene         ND         2.0         µg/L         42         0-Xylene         ND           8         Dichloroethane         ND         4.0         µg/L         43         1,1,2,2-Tetrachloroethane         ND           9         Freon-113         ND         2.0         µg/L         43         1,2,2-Tetrachloroethane         ND           10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           11         Methyl tert-butyl ether (MTBE)         ND         2.0         µg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         µg/L         47         n-Propylbenzene         ND           13         2-Butanone (MEK)         ND         40         µg/L         48         4-Chlorotoluene         ND           14         cis-1,2-Dichloroethane         ND         2.0         µg/L         50	2.0 2.0 2.0 2.0 4.0 2.0	) μg/L ) μg/L ) μg/L ) μg/L ) μg/L
6 Trichlorofluoromethane         ND         2.0 μg/L         41 Styrene         ND           7 1,1-Dichloroethene         ND         2.0 μg/L         42 ο-Xylene         ND           8 Dichloromethane         ND         4.0 μg/L         43 1,1,2,2-Tetrachloroethane         ND           9 Freon-113         ND         2.0 μg/L         44 1,2,3-Trichloropropane         ND           10 trans-1,2-Dichloroethene         ND         2.0 μg/L         45 Isopropylbenzene         ND           11 Methyl tert-butyl ether (MTBE)         ND         2.0 μg/L         46 Bromobenzene         ND           12 1,1-Dichloroethane         ND         2.0 μg/L         47 n-Propylbenzene         ND           13 2-Butanone (MEK)         ND         40 μg/L         48 4-Chlorotoluene         ND           14 cis-1,2-Dichloroethene         ND         2.0 μg/L         49 2-Chlorotoluene         ND           15 Bromochloromethane         ND         2.0 μg/L         50 1,3,5-Trimethylbenzene         ND           16 Chloroform         ND         2.0 μg/L         51 tert-Butylbenzene         ND           17 2,2-Dichloropropane         ND         2.0 μg/L         51 tert-Butylbenzene         ND           18 1,1-Trichloroethane         ND         2.0 μg/L         53 se	2.0 2.0 2.0 4.0 2.0	) µg/L ) µg/L ) µg/L ) µg/L
7         1,1-Dichloroethene         ND         2.0         µg/L         42         o-Xylene         ND           8         Dichloromethane         ND         4.0         µg/L         43         1,1,2,2-Tetrachloroethane         ND           9         Freon-113         ND         2.0         µg/L         44         1,2,3-Trichloroepane         ND           10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           11         Methyl tert-butyl ether (MTBE)         ND         2.0         µg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         µg/L         47         n-Propylbenzene         ND           13         2-Butanone (MEK)         ND         40         µg/L         48         4-Chlorotoluene         ND           14         cis-1,2-Dichloroethene         ND         2.0         µg/L         49         2-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         µg/L	2.0 2.0 4.0 2.0	μg/L ) μg/L ) μg/L
8         Dichloromethane         ND         4.0         µg/L         43         1,1,2,2-Tetrachloroethane         ND           9         Freon-113         ND         2.0         µg/L         44         1,2,3-Trichloropropane         ND           10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           11         Methyl tert-butyl ether (MTBE)         ND         2.0         µg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         µg/L         47         n-Propylbenzene         ND           13         2-Butanone (MEK)         ND         40         µg/L         47         n-Propylbenzene         ND           14         cis-1,2-Dichloroethane         ND         2.0         µg/L         48         4-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         µg/L         49         2-Chlorotoluene         ND           16         Chloroform         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L <td>4.0 2.0</td> <td>) µg/L ) µg/L</td>	4.0 2.0	) µg/L ) µg/L
Freon-113	4.0 2.0	) µg/L
10         trans-1,2-Dichloroethene         ND         2.0         µg/L         45         Isopropylbenzene         ND           11         Methyl tert-butyl ether (MTBE)         ND         2.0         µg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         µg/L         47         n-Propylbenzene         ND           13         2-Butanone (MEK)         ND         40         µg/L         48         4-Chlorotoluene         ND           14         cis-1,2-Dichloroethene         ND         2.0         µg/L         49         2-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         µg/L <td></td> <td></td>		
11         Methyl tert-butyl ether (MTBE)         ND         2.0         μg/L         46         Bromobenzene         ND           12         1,1-Dichloroethane         ND         2.0         μg/L         47         n-Propylbenzene         ND           13         2-Butanone (MEK)         ND         40         μg/L         48         4-Chlorotoluene         ND           14         cis-1,2-Dichloroethene         ND         2.0         μg/L         49         2-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         μg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         μg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         μg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         μg/L         53         sec-Butylbenzene         ND           19         1,1-Trichloroethane         ND         2.0         μg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0	2 0	) μg/L
12       1,1-Dichloroethane       ND       2.0       µg/L       47       n-Propylbenzene       ND         13       2-Butanone (MEK)       ND       40       µg/L       48       4-Chlorotoluene       ND         14       cis-1,2-Dichloroethene       ND       2.0       µg/L       49       2-Chlorotoluene       ND         15       Bromochloromethane       ND       2.0       µg/L       50       1,3,5-Trimethylbenzene       ND         16       Chloroform       ND       2.0       µg/L       51       tert-Butylbenzene       ND         17       2,2-Dichloropropane       ND       2.0       µg/L       52       1,2,4-Trimethylbenzene       ND         18       1,2-Dichloroethane       ND       2.0       µg/L       53       sec-Butylbenzene       ND         19       1,1,1-Trichloroethane       ND       2.0       µg/L       54       1,3-Dichlorobenzene       ND         20       1,1-Dichloropropene       ND       2.0       µg/L       55       1,4-Dichlorobenzene       ND         21       Carbon tetrachloride       ND       2.0       µg/L       56       4-Isopropyltoluene       ND         22       Dibromomethane	Z.U	
13         2-Butanone (MEK)         ND         40         µg/L         48         4-Chlorotoluene         ND           14         cis-1,2-Dichloroethene         ND         2.0         µg/L         49         2-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         µg/L         53         sec-Butylbenzene         ND           19         1,1,1-Trichloroethane         ND         2.0         µg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0         µg/L	2.0	
14         cis-1,2-Dichloroethene         ND         2.0         µg/L         49         2-Chlorotoluene         ND           15         Bromochloromethane         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         µg/L         53         sec-Butylbenzene         ND           19         1,1,1-Trichloroethane         ND         2.0         µg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         µg/L         56         4-Isopropyltoluene         ND           28         Benzene         ND         2.0         µg/L         57         1,2-Dichlorobenzene         ND           20         Dibromomethane         ND         2.0         µg/L <td>2.0</td> <td></td>	2.0	
15         Bromochloromethane         ND         2.0         µg/L         50         1,3,5-Trimethylbenzene         ND           16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         µg/L         53         sec-Butylbenzene         ND           19         1,1,1-Trichloroethane         ND         2.0         µg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0         µg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0         µg/L         58         n-Butylbenzene         ND	2.0	
16         Chloroform         ND         2.0         µg/L         51         tert-Butylbenzene         ND           17         2,2-Dichloropropane         ND         2.0         µg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         µg/L         53         sec-Butylbenzene         ND           19         1,1,1-Trichloroethane         ND         2.0         µg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0         µg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0         µg/L         58         n-Butylbenzene         ND	2.0	
17         2,2-Dichloropropane         ND         2.0         μg/L         52         1,2,4-Trimethylbenzene         ND           18         1,2-Dichloroethane         ND         2.0         μg/L         53         sec-Butylbenzene         ND           19         1,1,1-Trichloroethane         ND         2.0         μg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         μg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         μg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0         μg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0         μg/L         58         n-Butylbenzene         ND	2.0	
18       1,2-Dichloroethane       ND       2.0       µg/L       53       sec-Butylbenzene       ND         19       1,1,1-Trichloroethane       ND       2.0       µg/L       54       1,3-Dichlorobenzene       ND         20       1,1-Dichloropropene       ND       2.0       µg/L       55       1,4-Dichlorobenzene       ND         21       Carbon tetrachloride       ND       2.0       µg/L       56       4-Isopropyltoluene       ND         22       Benzene       ND       2.0       µg/L       57       1,2-Dichlorobenzene       ND         23       Dibromomethane       ND       2.0       µg/L       58       n-Butylbenzene       ND	2.0	
19         1,1,1-Trichloroethane         ND         2.0         µg/L         54         1,3-Dichlorobenzene         ND           20         1,1-Dichloropropene         ND         2.0         µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0         µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0         µg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0         µg/L         58         n-Butylbenzene         ND	2.0	
20         1,1-Dichloropropene         ND         2.0 µg/L         55         1,4-Dichlorobenzene         ND           21         Carbon tetrachloride         ND         2.0 µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0 µg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0 µg/L         58 n-Butylbenzene         ND	2.0	
21         Carbon tetrachloride         ND         2.0 µg/L         56         4-Isopropyltoluene         ND           22         Benzene         ND         2.0 µg/L         57         1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0 µg/L         58 n-Butylbenzene         ND	2.0	
22         Benzene         ND         2.0 μg/L         57 1,2-Dichlorobenzene         ND           23         Dibromomethane         ND         2.0 μg/L         58 n-Butylbenzene         ND	2.0	
23 Dibromomethane ND 2.0 µg/L 58 n-Butylbenzene ND	2.0	
	2.0	
	10	
25 Trichloroethene ND 2.0 μg/L 60 1,2,4-Trichlorobenzene ND	4.0	
26 Bromodichloromethane ND 2.0 µg/L 61 Naphthalene ND	4.0	1-0-
27 4-Methyl-2-pentanone (MIBK) ND 10 µg/L 62 Hexachlorobutadiene ND	4.0	I-3-
28 cis-1,3-Dichloropropene ND 2.0 µg/L 63 1,2,3-Trichlorobenzene ND	4.0	
20 Areas 4.0 Births	0-130)	1.0
20. 44.0 Tetallocate	0-130)	
	0-130)	
32 1,3-Dichloropropane ND 2.0 µg/L	3 .50)	/U/\_C
33 Dibromochloromethane 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

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

μg/L

μg/L

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** 



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## **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083104-03A

Client I.D. Number: MW-3-2

D 116

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

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 L	imit
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 (DBC	P) 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					
24	4.2 Dibanas athems (EDD)								

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Saulur

ND

Walter Atrilon

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

1.0

μg/L

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



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## **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway San Diego, CA 92101

Client I.D. Number: EB-06-8/30/11

Attn: Phone David Conner

Pho

Phone: (619) 726-7311

Fax:

(614) 458-6641

Job: 100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083104-04A

Received: 08/31/11

Extracted: 09/06/11 12:36 Analyzed: 09/06/11 12:36

Sampled: 08/30/11 10:55

## Volatile Organics by GC/MS EPA Method SW8260B

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting L	.imit
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	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	, .
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xylene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	
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	
11	Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.50	
12	1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.50	, .
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	
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	•	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 (DBC)	T .	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)	
32	1,3-Dichloropropane	ND	0.50	μg/L			,	(.5 100)	,,,,
33	Dibromochloromethane	ND	0.50	μg/L					
3.4	1.2 Dibromoothone (EDD)								

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Sanlan

ND

Walter Strikmer

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

1.0

0.50

μg/L

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
Page 1 of 1



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## **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083104-05A

Client I.D. Number: TB-06-8/30/11

Attn: David Conner

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

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 I	imit
1	Dichlorodifluoromethane	ND	0.50	μg/L	36	1,1,1,2-Tetrachloroethane	ND		
2	Chloromethane	ND	1.0	μg/L	37		ND	0.50	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene		0.50	1-3-
4	Chloroethane	ND	0.50	μg/L	39	m.p-Xvlene	ND	0.50	P-3
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xvlene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	F 9 -
9	Freon-113	ND	0.50	μg/L	44	1,2,3-Trichloropropane	ND	0.50	. •
10	The same of the sa	ND	0.50	μg/L	45	Isopropylbenzene	ND	1.0	, ,
11	Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.50	
12	1,1-Dichloroethane	ND	0.50	μg/L	47		ND	0.50	
13	2-Butanone (MEK)	ND	10	μg/L μg/L	48	n-Propylbenzene 4-Chlorotoluene	ND	0.50	
14	cis-1,2-Dichloroethene	ND	0.50	µg/L µg/L	49	2-Chlorotoluene	ND	0.50	
15	Bromochloromethane	ND	0.50	μg/L μg/L			ND	0.50	r 3 -
16	Chloroform	ND	0.50		50	1,3,5-Trimethylbenzene	ND	0.50	
17	2,2-Dichloropropane	ND	0.50	μg/L	51	tert-Butylbenzene	ND	0.50	
18	1,2-Dichloroethane	ND	0.50	μg/L	52	1,2,4-Trimethylbenzene	ND	0.50	μg/L
19	1,1,1-Trichloroethane	ND	0.50	μg/L	53	sec-Butylbenzene	ND	0.50	µg/L
20	1,1-Dichloropropene	ND	0.50	μg/L	54	1,3-Dichlorobenzene	ND	0.50	μg/L
21	Carbon tetrachloride	ND ND		μg/L	55	1,4-Dichlorobenzene	ND	0.50	μg/L
22	Benzene	ND	0.50	µg/L	56	4-Isopropyltoluene	ND	0.50	μg/L
23	Dibromomethane	ND	0.50	µg/L	57	1,2-Dichlorobenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	µg/L	58	n-Butylbenzene	ND	0.50	μg/L
25	Trichloroethene	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBCF		2.5	μg/L
26	Bromodichloromethane	ND ND	0.50	µg/L	60	1,2,4-Trichlorobenzene	ND	1.0	μg/L
27	4-Methyl-2-pentanone (MIBK)	ND	0.50	µg/L	61	Naphthalene	ND	1.0	μg/L
28	cis-1,3-Dichloropropene		2.5	µg/L	62	Hexachlorobutadiene	ND	1.0	μg/L
29	trans-1,3-Dichloropropene	ND ND	0.50	µg/L	63	1,2,3-Trichlorobenzene	ND	1.0	μg/L
30	1,1,2-Trichloroethane	i	0.50	μg/L	64	Surr: 1,2-Dichloroethane-d4	111	(70-130)	%REC
31	Toluene	ND	0.50	µg/L	65	Surr: Toluene-d8	97	(70-130)	%REC
32	1,3-Dichloropropane	ND	0.50	µg/L	66	Surr: 4-Bromofluorobenzene	88	(70-130)	%REC
33	Dibromochloromethane	ND	0.50	µg/L					
34	1,2-Dibromoethane (EDB)	ND	0.50	µg/L					
35	Tetrachloroethene	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Tetrachloroethene

Roger Scholl

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.

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

Toundwater Wontoning

Sampled: 08/30/11 08:43

Received: 08/31/11

Extracted: 09/06/11 16:55 Analyzed: 09/06/11 16:55

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

## Volatile Organics by GC/MS EPA Method SW8260B

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting Li	imit
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-Xvlene	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/!_	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 (DBC)	P) 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			,	• •	

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

33 Dibromochloromethane

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Saulman

ND

ND

ND

Walter Finhon

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

μg/L

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



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## ANALYTICAL REPORT

Battelle Memorial Institute 655 West Broadway

Attn: David Conner Phone: (619) 726-7311

San Diego, CA 92101

Fax: (614) 458-6641

100006114/JPL Groundwater Monitoring

Sampled: 08/30/11 09:07

Received: 08/31/11

Extracted: 09/06/11 17:17 Analyzed: 09/06/11 17:17

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

## Volatile Organics by GC/MS EPA Method SW8260B

	Compound	Concentration	Reporting	Limit		Compound	Concentration	Reporting L	imit
1	Dichlorodifluoromethane	ND 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	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xylene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1.1.2.2-Tetrachloroethane	ND	0.50	. •
9	Freon-113	ND	0.50	μg/L	44	1,2,3-Trichloropropane	ND	1.0	
10	trans-1,2-Dichloroethene	ND	0.50	μg/L	45	Isopropylbenzene	ND	0.50	
11	Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.50	
12	1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.50	
13	2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND	0.50	
14	cis-1,2-Dichloroethene	ND	0.50	µg/L	49	2-Chlorotoluene	ND	0.50	
15	Bromochloromethane	ND	0.50	μg/L	50	1,3,5-Trimethylbenzene	ND	0.50	
16	Chloroform	ND	0.50	μg/L	51	tert-Butylbenzene	ND	0.50	
17	2,2-Dichloropropane	ND	0.50	μg/L	52	1,2,4-Trimethylbenzene	ND	0.50	
18	1,2-Dichloroethane	ND	0.50	μg/L	53	sec-Butylbenzene	ND	0.50	
19	1,1,1-Trichloroethane	ND	0.50	μg/L	54	1.3-Dichlorobenzene	ND	0.50	
20	1,1-Dichloropropene	ND	0.50	μg/L	55	1.4-Dichlorobenzene	ND	0.50	
21	Carbon tetrachloride	ND	0.50	μg/L	56	4-Isopropyltoluene	ND	0.50	
22	Benzene	ND	0.50	μg/L	57	1.2-Dichlorobenzene	ND	0.50	
23	Dibromomethane	ND	0.50	µg/L	58	n-Butylbenzene	ND	0.50	
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBCI		2.5	μg/L
25	Trichloroethene	ND	0.50	μg/L	60	1.2.4-Trichlorobenzene	ND	1.0	
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	•	54	,	(10 100)	, , , , , ,
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	0.00	µg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

0.75

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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.

**Report Date** 



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## **VOC Sample Preservation Report**

Work Order: BMI11083104 Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН	
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



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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

Client I.D. Number: MW-4-1

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11083104-08A

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 L	imit
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	
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	F-0-
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xvlene	ND	0.50	μg/L
8	Dichloromethane	ND	1.0	μg/L	43	1.1.2.2-Tetrachloroethane	ND	0.50	
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	
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	
14	cis-1,2-Dichloroethene	ND	0.50	µg/L	49	2-Chlorotoluene	ND	0.50	
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 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 (DBCI		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	traris-1,3-Dichloroproperie	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	•		, 00	(10 100)	,,,,,
33	Dibromochloromethane	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

ND

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

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

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μg/L

Report Date



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<b>Date:</b> 13-Sep-11		(	QC S	umma	ry Repo	rt				<b>Work Orde</b> 11083104	
Method Bla	nk		Type: I		Test Code: E		hod 314.0	Analysis	s Date:	09/06/2011 12:48	
Sample ID:	MB-27248	Units : µg/L		Run ID: I	C_3_110906	A		Prep Da	ite:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	al SpkRefVal	%REC	LCL(ME)	UCL(ME) R	PDRef\	/al %RPD(Limit)	Qual
Perchlorate		ND		1							
Laboratory File ID: 15	Fortified Blank	-	Type: L		Test Code: E		thod 314.0	Analysis	s Date:	09/06/2011 13:06	
Sample ID:	LFB-27248	Units : µg/L		Run ID: I	C_3_110906	A		Prep Da	ite:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	al SpkRefVa	%REC	LCL(ME)	UCL(ME) R	PDRef\	/al %RPD(Limit)	Qual
Perchlorate		24.4	:	2 2	5	98	85	115			
Sample Mat	trix Spike		Type: L	.FM	Test Code: E	PA Met	thod 314.0				
File ID: <b>34</b>					Batch ID: 272	48		Analysis	s Date:	09/06/2011 18:56	
Sample ID:	11090203-04ALFM	Units : µg/L		Run ID:	C_3_110906	A		Prep Da	ite:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	al SpkRefVa	%REC	LCL(ME)	UCL(ME) R	PDRef\	/al %RPD(Limit)	Qual
Perchlorate		23.8		2 2	5 1.821	88	80	120			
Sample Mat	trix Spike Duplicate		Type: I	_FMD	Test Code: E	PA Met	thod 314.0				
File ID: 35					Batch ID: 272	48		Analysis	s Date:	09/06/2011 19:14	
Sample ID:	11090203-04ALFMD	Units : µg/L		Run ID:	C_3_110906	A		Prep Da	ate:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	al SpkRefVa	%REC	LCL(ME)	UCL(ME) R	PDRef\	/al %RPD(Limit)	Qual
Perchlorate		24.2		2 2	5 1.821	89	80	120	23.78	3 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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<b>Date:</b>	QC Sur	nmary Report		<b>Work Order:</b> 11083104
Method Blank File ID: 090611.B\105_M.D\	Туре МВІ	LK Test Code: EPA Method : Batch ID: 27253		09/06/2011 22:56
Sample ID: MB-27253	Units : mg/L Rt	un ID: ICP/MS_110906E	Prep Date:	09/06/2011 14:00
Analyte	Result PQL	SpkVal SpkRefVal %REC LCL	(ME) UCL(ME) RPDRef\	/al %RPD(Limit) Qual
Chromium (Cr)	ND 0.005			•
Laboratory Control Spike	Type LCS	Test Code: EPA Method 2	200.8	
File ID: <b>090611.B\106_M.D\</b>		Batch ID: 27253	Analysis Date:	09/06/2011 23:02
Sample ID: LCS-27253	Units : mg/L Ru	ın ID: ICP/MS_110906E	Prep Date:	09/06/2011 14:00
Analyte	Result PQL	SpkVal SpkRefVal %REC LCL	(ME) UCL(ME) RPDRef\	/al %RPD(Limit) Qual
Chromium (Cr)	0.0502 0.005	0.05 100 8	35 115	
Sample Matrix Spike	Type MS	Test Code: EPA Method 2	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 Ru	ın ID: <b>ICP/MS_110906E</b>	Prep Date:	09/06/2011 14:00
Analyte	Result PQL	SpkVal SpkRefVal %REC LCL	(ME) UCL(ME) RPDRef\	/al %RPD(Limit) Qual
Chromium (Cr)	0.0523 0.005	0.05 0 105 7	0 130	
Sample Matrix Spike Duplicate	Type MSI	Test Code: EPA Method 2	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 Ru	ın ID: <b>ICP/MS_110906E</b>	Prep Date:	09/06/2011 14:00
Analyte	<del>-</del>	SpkVal SpkRefVal %REC LCL	(ME) UCL(ME) RPDRef\	/al %RPD(Limit) Qual
Chromium (Cr)	0.0507 0.005		0 130 0.0523	

## 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 Summ	ary Report		<b>Work Order:</b> 11083104
Method Blank		Type: MBLK	Test Code: EPA Method S	W8260B	
File ID: 11090606.D			Batch ID: MS15W0906M	Analysis Date	e: <b>09/06/2011 10:27</b>
Sample ID: MBLK MS15W0906M	Units : μg/L	Run II	D: MSD_15_110906A	Prep Date:	09/06/2011 10:27
Analyte	Result	PQL Spk	Val SpkRefVal %REC LCL(N	ME) UCL(ME) RPDRe	efVal %RPD(Limit) Qu
Dichlorodifluoromethane	ND	0.5			
Chloromethane	ND	1			
Vinyl chloride Chloroethane	ND ND	0.5			
Bromomethane	ND	0.5 1			
Trichlorofluoromethane	ND	0.5			
1,1-Dichloroethene	ND	0.5			
Dichloromethane Freon-113	ND	1			
trans-1,2-Dichloroethene	ND ND	0.5 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 Bromochloromethane	ND ND	0.5			
Chloroform	ND ND	0.5 0.5			
2,2-Dichloropropane	ND ND	0.5			
1,2-Dichloroethane	ND	0.5			
1,1,1-Trichloroethane	ND	0.5			
1,1-Dichloropropene Carbon tetrachloride	ND ND	0.5			
Benzene	ND ND	0.5 0.5			
Dibromomethane	ND	0.5			
1,2-Dichloropropane	ND	0.5			
Trichloroethene	ND	0.5			
Bromodichloromethane 4-Methyl-2-pentanone (MIBK)	ND	0.5			
cis-1,3-Dichloropropene	ND ND	2.5 0.5			
trans-1,3-Dichloropropene	ND	0.5			
1,1,2-Trichloroethane	ND	0.5			
Toluene 1,3-Dichloropropane	ND	0.5			
Dibromochloromethane	ND ND	0.5 0.5			
1,2-Dibromoethane (EDB)	ND	0.3			
Tetrachloroethene	ND	0.5			
1,1,1,2-Tetrachloroethane	ND	0.5			
Chlorobenzene Ethylbenzene	ND	0.5			
m,p-Xylene	ND ND	0.5 0.5			
Bromoform	ND	0.5			
Styrene	ND	0.5			
o-Xylene	ND	0.5			
1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane	ND ND	0.5			
Isopropylbenzene	ND ND	1 0.5			
Bromobenzene	ND	0.5			
n-Propylbenzene	ND	0.5			
4-Chlorotoluene 2-Chlorotoluene	ND ND	0.5			
2-Chlorotolderie 1,3,5-Trimethylbenzene	ND ND	0.5 0.5			
tert-Butylbenzene	ND	0.5			
1,2,4-Trimethylbenzene	ND	0.5			
sec-Butylbenzene	ND	0.5			
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ND ND	0.5			
4-Isopropyltoluene	ND ND	0.5 0.5			
1,2-Dichlorobenzene	ND	0.5			
n-Butylbenzene	ND	0.5			
1,2-Dibromo-3-chloropropane (DBCP)	ND ND	2.5			
1,2,4-Trichlorobenzene Naphthalene	ND ND	1 1			
Hexachlorobutadiene	ND ND	1			
1,2,3-Trichlorobenzene	ND	1			
Surr: 1,2-Dichloroethane-d4	10.5	•	10 105 70		
Surr: Toluene-d8	9.89		10 99 70	130	



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<b>Date:</b> 13-Sep-11	QC	Summary Re	port			Work Order: 11083104
Surr: 4-Bromofluorobenzene	8.76	10	88	70	130	



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<b>Date:</b> 13-Sep-11		(	QC Sι	ımmary	Report			<b>Work Ord</b> e 11083104	
Laboratory Co			Type: Lo	CS Te	st Code: EPA Meti	hod SW82	260B		
File ID: 11090604	J.D			Ва	tch ID: MS15W090	6M	Analysis Date	: 09/06/2011 09:29	
Sample ID: Lo	CS MS15W0906M	Units : μg/L		Run ID: MS	D_15_110906A		Prep Date:	09/06/2011 09:29	
Analyte		Result	PQL	SpkVal	SpkRefVal %REC	LCL(ME)	UCL(ME) RPDRe	fVal %RPD(Limit)	Qua
Dichlorodifluorome	ethane	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 Bromomethane		11.9 7.6	1	10	119	<b>7</b> 0	130 130		
Trichlorofluoromet	thane	7.6 12.6	2 1	10 10	76 126	<b>7</b> 0 <b>7</b> 0	130		
1,1-Dichloroethene		9.62	1	10	96	70	130		
Dichloromethane		9.55	2	10	96	70	130		
Freon-113	41	10.6	1	10	106	70	137		
trans-1,2-Dichloro		9.97	1	10	99.7	70	130		
Methyl tert-butyl et 1,1-Dichloroethand		10.1	0.5	10	101	70	130		
2-Butanone (MEK		9.92 262	1 10	10 200	99 131	70 70	130 130(130)		L51
cis-1,2-Dichloroeth		10	10	10	100	70 70	130(130)		LUI
Bromochlorometha		10.4	1	10	100	70 70	130		
Chloroform		10.2	1	10	102	70	130		
2,2-Dichloropropa		10.2	1	10	102	70	130		
1,2-Dichloroethan		10.5	1	10	105	70	130		
1,1,1-Trichloroetha		10.4	1	10	104	70	130		
1,1-Dichloroproper Carbon tetrachloric		10.6	1	10	106	70 70	130		
Benzene	ae	10.2 10.3	1	10	102	70 70	130		
Dibromomethane		10.5	0.5 1	10 10	103 105	70 70	130 130		
1,2-Dichloropropai	ne	9.75	1	10	98	70	130		
Trichloroethene		10.2	1	10	102	70	130		
Bromodichloromet		10.5	1	10	105	70	130		
4-Methyl-2-pentan		28.8	2.5	25	115	20	182		
cis-1,3-Dichloropro trans-1,3-Dichlorop		10.1	1	10	101	70	130		
1,1,2-Trichloroetha		9.39 10.5	1 1	10 10	94 105	70 70	130 130		
Toluene		9.96	0.5	10	99.6	70 70	130		
1,3-Dichloropropar	ne	9.73	1	10	97	70	130		
Dibromochloromet		9.09	1	10	91	70	130		
1,2-Dibromoethan		19.7	2	20	98	70	130		
Tetrachloroethene 1,1,1,2-Tetrachloro		9.97	1	10	99.7	70	130		
Chlorobenzene	pemane	10.3	1	10	103	70 70	130		
Ethylbenzene		9.73 10.7	1 0.5	10 10	97 107	70 70	130 130		
m,p-Xylene		10.4	0.5	10	107	70 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-Tetrachloro		9.34	1	10	93	70	130		
Isopropylbenzene	Darie	20.1 9.46	2	20 10	101 95	70 70	130		
Bromobenzene		9.76	1 1	10	95 98	70 70	130 130		
n-Propylbenzene		9.78	<u> </u>	10	98	70 70	130		
4-Chlorotoluene		9.48	1	10	95	70	130		
2-Chlorotoluene		9.39	1	10	94	70	130		
1,3,5-Trimethylben	nzene	10.1	1	10	101	70	130		
tert-Butylbenzene 1,2,4-Trimethylben	17000	9.79	1	10	98	70	130		
sec-Butylbenzene	IZCIIE	10.2 9.64	1	10 10	102	70 70	130		
1,3-Dichlorobenzer	ne	10.3	1	10 10	96 103	70 70	130 130		
1,4-Dichlorobenzer	ne	9.39	1	10	94	70 70	130		
4-Isopropyltoluene		10.1	1	10	101	70	130		
1,2-Dichlorobenzer	ne	9.42	1	10	94	70	130		
n-Butylbenzene	· · · · · · · · · · · · · · · · · · ·	10.5	1	10	105	<b>7</b> 0	130		
	oropropane (DBCP)	49.1	3	50	98	67	130		
1,2,4-Trichloroben: Naphthalene	zene	9.36 9.56	2	10	94	70 70	130		
Hexachlorobutadie	ene	8.56 21.3	2 2	10 20	86 106	70 70	130 130		
1,2,3-Trichlorobena		9.73	2	20 10	97	70 <b>7</b> 0	130		
Surr: 1,2-Dichloroe		10.5	_	10	105	70	130		
Surr: Toluene-d8		9.57		10	96	70	130		



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<b>Date:</b> 13-Sep-11	QC :	Summary Re	port			<b>Work Order:</b> 11083104
Surr: 4-Bromofluorobenzene	9.17	10	92	70	130	



Date:

## Alpha Analytical, Inc.

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**QC Summary Report** 

Work Order:

**-**Sep-11 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: µq/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 Chloromethane 48.5 Vinvl chloride 51.1 2.5 Chloroethane 53.4 2.5 **Bromomethane** 37.6 Trichlorofluoromethane 2.5 1.1-Dichloroethene 44.4 2.5 Dichloromethane Freon-113 50.6 2.5 trans-1,2-Dichloroethene 45.6 2.5 Methyl tert-butyl ether (MTBE) 48.6 1.3 1,1-Dichloroethane 45.6 2.5 **Q1** 2-Butanone (MEK) cis-1,2-Dichloroethene 46.9 2.5 Bromochloromethane 48.3 2.5 Chloroform 50.8 2.5 2.66 2,2-Dichloropropane 46.2 2.5 1.2-Dichloroethane 2.5 1,1,1-Trichloroethane 2.5 1,1-Dichloropropene 48.9 2.5 Carbon tetrachloride 48.1 2.5 Benzene 47.5 1.3 Dibromomethane 49.9 2.5 99.7 1,2-Dichloropropane 45.7 2.5 Trichloroethene 46.9 2.5 Bromodichloromethane 48.8 2.5 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene 2.5 trans-1,3-Dichloropropene 43.3 2.5 1,1,2-Trichloroethane 49.2 2.5 Toluene 45.1 1.3 1,3-Dichloropropane 45.5 2.5 Dibromochloromethane 42.5 2.5 1.2-Dibromoethane (EDB) 92.1 Tetrachloroethene 2.5 2.17 1,1,1,2-Tetrachloroethane 2.5 Chlorobenzene 44.9 2.5 n Ethylbenzene 48.3 1.3 m,p-Xylene 47.4 1.3 **Bromoform** 43.2 2.5 Styrene 2.5 40.7 o-Xylene 47.1 1.3 1,1,2,2-Tetrachloroethane 45.4 2.5 1,2,3-Trichloropropane 96.8 Isopropylbenzene 43.3 2.5 Bromobenzene 45.3 2.5 n-Propylbenzene 44.8 2.5 4-Chlorotoluene 43.5 2.5 2-Chlorotoluene 42.9 2.5 1,3,5-Trimethylbenzene 46.6 2.5 tert-Butylbenzene 45.1 2.5 1,2,4-Trimethylbenzene 46,4 2.5 sec-Butylbenzene 44.7 2.5 1.3-Dichlorobenzene 47.2 2.5 1,4-Dichlorobenzene 43.6 2.5 4-Isopropyltoluene 2.5 46.6 1.2-Dichlorobenzene 43.6 2.5 n-Butvlbenzene 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene 43.4 Naphthalene 39.9 Hexachlorobutadiene 1,2,3-Trichlorobenzene 45.2 Surr: 1,2-Dichloroethane-d4 54.4 Surr: Toluene-d8 47.2 



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<b>Date:</b> 13-Sep-11	QC	Summary Re	port			Work Order:
Surr: 4-Bromofluorobenzene						11083104
	46.2	50	92	70	130	



## Alpha Analytical, Inc.

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<b>Date:</b> 13-Sep-11	(	QC Si	ummar	y Repor	t				<b>Work Ord</b> e 11083104	
Sample Matrix Spike Duplicate		Type: M	ISD Te	est Code: EF	A Met	thod SW82	260B			
File ID: <b>11090608.D</b>			Ва	atch ID: MS1	5W09	06M	Analys	sis Date: 0	9/06/2011 11:10	
Sample ID: 11090203-04AMSD	Units : µg/L		Run ID: MS	SD_15_1109	06A		Prep l	Date: 0	9/06/2011 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 Chloroethane	54	2.5		0	108	49	136	51.13	5.4(21)	
Bromomethane	56.7 42.4	2.5	-	0	113	21	159	53.38	6.0(40)	
Trichlorofluoromethane	42.4 61.4	10 2.5		0	85 123	10 32	174 154	37.64 59.95	12.0(40) 2.5(37)	
1,1-Dichloroethene	46.2	2.5		0	92	64	130	44.35	4.1(21)	
Dichloromethane	45.6	10		Ö	91	69	130	44	3.5(20)	
Freon-113	51.4	2.5		0	103	55	141	50.58	1.6(40)	
trans-1,2-Dichloroethene Methyl tert-butyl ether (MTBE)	47.9	2.5		0	96	63	130	45.58	5.0(20)	
1,1-Dichloroethane	50.3 48	1.3 2.5		0	101 96	47 66	150	48.56 45.61	3.5(40)	
2-Butanone (MEK)	881	2.5 50		0	96 88	23	130 182	45.61 893.5	5.2(20) 1.4(22)	
cis-1,2-Dichloroethene	48.7	2.5		0	97	70	130	46.91	3.8(20)	
Bromochloromethane	50.2	2.5		Ö	100	70	132	48.28	3.9(20)	
Chloroform	53	2.5		2.66	101	70	130	50.79	4.2(20)	
2,2-Dichloropropane 1,2-Dichloroethane	48.8	2.5		0	98	38	154	46.19	5.5(22)	
1,1,1-Trichloroethane	51.1	2.5		0	102	65 65	134	49.98	2.2(20)	
1,1-Dichloropropene	50.6 50.9	2.5 2.5		0	101 102	65 68	136 132	48.03 48.92	5.1(20) 3.9(20)	
Carbon tetrachloride	50.5	2.5		0	101	58	148	48.08	4.8(20)	
Benzene	49	1.3		Ö	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		0	94	70	131	45.7	2.7(20)	
Trichloroethene Bromodichloromethane	48.4	2.5		0	97	65	144	46.93	3.1(20)	
4-Methyl-2-pentanone (MIBK)	49.8 128	2.5 13		0	99.7 102	50 20	157 182	48.78 131.6	2.1(20)	
cis-1,3-Dichloropropene	45.9	2.5		0	92	63	131	44.96	2.7(20) 2.1(20)	
trans-1,3-Dichloropropene	43.8	2.5		Ö	88	65	136	43.31	1.1(20)	
1,1,2-Trichloroethane	49.2	2.5		0	98	70	131	49.17	0.1(20)	
Toluene 1,3-Dichloropropane	47.6	1.3		0	95	68	130	45.14	5.3(20)	
Dibromochloromethane	46.6	2.5		0	93	70	130	45.46	2.4(20)	
1,2-Dibromoethane (EDB)	44.1 95.2	2.5 5		0	88 95	42 70	155 130	42.48 92.13	3.6(20) 3.3(20)	
Tetrachloroethene	50.5	2.5		2,17	97	65	130	48.04	5.0(20)	
1,1,1,2-Tetrachloroethane	49	2.5		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 m.p. Yvlone	50.6	1.3		0	101	68	130	48.32	4.7(20)	
m,p-Xylene Bromoform	49.1	1.3		0	98	68	131	47.38	3.5(20)	
Styrene	43.9 42.4	2.5 2.5		0	88 85	65 59	143 153	43.24 40.73	1.6(20) 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		Ö	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 Bromobenzene	45.3	2.5		0	91	55	138	43.34	4.4(20)	
n-Propylbenzene	47.3 47	2.5	50 50	0	95	70	130	45.25	4.5(20)	
4-Chlorotoluene	45.3	2.5 2.5	50 50	0 0	94 91	67 70	133 130	44.76 43.54	4.9(30) 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		Ö	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 1,3-Dichlorobenzene	46.6	2.5	50	0	93	68	135	44.7	4.1(20)	
1,4-Dichlorobenzene	49.3 45.1	2.5 2.5	50 50	0	99 90	70 70	130 130	47.2 43.55	4.4(20) 3.4(20)	
4-Isopropyltoluene	48.5	2.5	50 50	0	90 97	68	132	43.33 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	Ō	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 Naphthalene	47.1	10	50	0	94	62	133	43.43	8.2(29)	
Hexachlorobutadiene	43.8 108	10 10	50 100	0 0	88 109	32	166 130	39.91	9.2(40)	
1,2,3-Trichlorobenzene	49.8	10	100 50		108 99.5	63 55	130 138	99.01 45.24	8.6(21) 9.5(36)	
Surr: 1,2-Dichloroethane-d4	53.1		50	U	106	70	130	10.27	0.0(00)	
Surr: Toluene-d8	48.2		50		96	70	130			



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Date: _13-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11083104
Surr: 4-Bromofluorobenzene	45.7	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

## Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778

TEL: (775) 355-1044 FAX: (775) 355-0406

Report Attention Phone Number EMail Address

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

San Diego, CA 92101 : 287215

Client's COC #: 25569, 25568

CA

Page: 1 of 1

WorkOrder: BMIS11083104

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

EDD Required : Yes

Sampled by : Chase Brogdon

Cooler Temp Samples Received Date Printed

0 °C 31-Aug-2011 31-Aug-2011

100006114/JPL Groundwater Monitoring 31-Aug-2011

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

. Эор :

Shane Walton

(619) 726-7311 x (614) 424-4899 x

connerd@battelle.org

(614) 424-4117 x

cutiee@batelle.org
waltons@battelle.org

David Conner

			TO THE REAL PROPERTY OF THE PARTY OF THE PAR							Requested Tests	Tests	
Alpha	Client		Collection	No. of Bottles	<b>Bottles</b>		314_W	METALS	METALS_D VOC_TIC_			
Sample ID	Sample ID	Mai	Matrix Date	Alpha Sub	Sub	TAT		€	*			Sample Remarks
BMI11083104-01A	MW-3-4	AQ	08/30/11 10:41	Ŋ	0	9	Perchlorate	Ω	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-02A	MW-3-3	AQ	08/30/11 11:02	Ŋ	0	ဖ	Perchlorate	Ω	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-03A	MW-3-2	ΑQ	08/30/11 11:27	თ	0	9	Perchlorate	Ç	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-04A	EB-06-8/30/11	ΑQ	08/30/11 10:55	თ	0	9	Perchlorate	Ω	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-05A	TB-06-8/30/11	Ą	08/30/11 07:00		0	9			VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		Reno Trip Blank 6/22/11
BMI11083104-06A	MW-4-3	Ā Q	08/30/11 08:43	Ωı	0	9	Perchlorate	Ω	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-07A	MW-4-2	Ą Q	08/30/11 09:07	თ	0	9	Perchlorate	ç	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		
BMI11083104-08A MW-4-1	MW-4-1	AQ	08/30/11 09:28	<b>О</b> Т	0	9	Perchlorate	ਨ	VOC by 524 Criteria	VOC by 524 VOC by 524 Criteria Criteria		Level IV QC

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).:

Comments:

	Logged in by:	W. 1554
	Chyabeth	Sign
	(Id Cox	ature
The state of the s	Elizabeth	Print Name
	Adcox	)
	Alpha Analytical, Inc.	Company
	83/-11 1157	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:		J	Stad From Which States ONDAG
N.	Alpna Analytical, inc. 255 Glendale Avenue, Suite 21		WA
Address SOS KING AUG. City, State, Zip ColumBus, OH 4320	(35)	89431-5778	OTHER Page # Of
Fax	, m, (11) 000 0000	WILLIAM /	Analyses Required /
E / DAVID CONNER	TO.# 2872/5   Job#	12	
QID TOWN AVE. C-205	EMail Address CONNERD & ISMITELLE	· ORG	
50 CM 92110	7311	1 / 199-85H	(EDD) EDF7 YES
Matrix' Sampled by See Key (1995)	MUD CONNER	7T	Global ID #
Lab ID Number (Use Only)	le Description	to,	<i>-</i>
$\succeq$	No 4- E- MM	S VADIO DE X	
20.	mw - 3 - 3		
.03	MW - 3 - 2	S vadious X	
105.	E3-8-8/30/11	3,2p X X X	Esty Mens Brook
0700 8/34/11 AQ	TB-06-8/30/11	Z X	TRIP BLANK
ADDITIONAL INSTRUCTIONS:			
Signature	Print Name	Company	Date Time
Relinquished by	CHASE Brokesof	INS1644	A30/11 1400
Heceived by	Arthury Steel		112/ 1/08/18
nellindusined by	7 ~ 0 :	., ., .,	1. 1415
Relinquished by Condition (LaCox	Elizabeth Hacox	Hona	8.3/-11 1167
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	OT - Other AR - Air **: L-Liter ported unless other arrangements are made. Hazi	V-Voa S-Soil Jar O-Orbo T-To ardous samples will be returned to client or dis	T-Tedlar B-Brass P-Plastic OT-Other disposed of at client expense. The report for the analysis
of the above complex in applicable and the state of			

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:			ر
1 GGRALO	Alpha 255 Gle		- U
e, Zip ColumBus	(0)		
Phone Number Fax		<b>\</b>	Analyses Required
Client Name TEHE / DAVID CONNER	212482 SHAM 100# 100	100 # 100000 # 11 # 100000 # # 11 # 1000000 # 1 # 1	Required QC Level?
Address 3990 OID town Aug. C-205	EMail Address	24.	14.0
City, State, Zip Dieco, CA 9210		17) HS8- 1891 (17)	(FDD)/FDF2 VES
<u>s – </u>	- 1	l and type of	
Sampled Sampled Below Lab ID Number (Use Only)	Sample Description	Tor	<i>-</i>
010.	6 mm - 4 - 3	S VARLIOUS X Y	
90+ 8/30/1	mw-4-2		X
9728 digh 1 . 0	08 mm. H. 1	S various X X	X LEVEL IN OC
			H C
ADDITIONAL INSTRUCTIONS:			
Signature	Print Name	Company	Date Time
Relinquished by	CHASE BALLED	Lashout est w	00/1 1/05/8
Received by	Jakon Stake	Alph, Azes	
Reinquished by	71 (1	"," 40	813011 1415
Relinquished by	Elizabeth Hdc	ax 1-1 pha	8:31-11 1157
Received by			

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.

\*Key: AQ - Aqueous

SO - Soil

WA - Waste

OT - Other

AR - Air

\*\*: L-Liter

V-Voa

S-Soil Jar

0-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



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**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**

	Manually Integrated Alian	<del>(1CS</del>	
Alpha's Sample 1D	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

Kandy Saulur

Walter Arikun



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: MW-22-3 Lab ID: BMI11090105-01A Date Sampled 08/31/11 08:53	Perchlorate	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 Date Sampled 08/31/11 09:16	Perchlorate	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: BMI11090105-03 A Date Sampled 08/31/11 09:41	Perchlorate	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 Date Sampled 08/31/11 09:32	Perchlorate	ND	1.00 μg/L	09/06/11 11:51	09/06/11 17:24

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.

**Report Date** 

100006114/JPL Groundwater Monitoring



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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: 09/01/11

Job:

100006114/JPL Groundwater Monitoring

Metals by ICPMS

EPA Method 200.8

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-22-3 Lab ID: BMI11090105-01A Date Sampled 08/31/11 08:53	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:02
Client ID: MW-22-2 Lab ID: BMI11090105-02A Date Sampled 08/31/11 09:16	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:08
Client ID: MW-22-1 Lab ID: BMI11090105-03A Date Sampled 08/31/11 09:41	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:14
Client ID: EB-07-08/31/11 Lab ID: BMI11090105-04A Date Sampled 08/31/11 09:32	Chromium (Cr)	ND	0.0050 mg/L	09/02/11 18:05	09/06/11 22:20

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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## 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

			Estimated		
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID : MW-22-3 Lab ID : BMI11090105-01A 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 : MW-22-2 Lab ID : BMI11090105-02A 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 : MW-22-1 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 16:0:
Client ID : EB-07-08/31/11 Lab ID : BMI11090105-04A 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 12:01
Client ID: TB-07-08/31/11 Lab ID: BMI11090105-05A 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.

100006114/JPL Groundwater Monitoring

ND = Not Detected

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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.

Report Date



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## ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090105-01A

Client I.D. Number: MW-22-3

Attn: David Conner

(619) 726-7311 Phone:

(614) 458-6641 Fax:

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	R	eporting	Limit		Compound	Concentration	Reporting Li	imit
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	J	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	
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	
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	
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 (DBC	P) 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			'		

Note: Analysis conducted using EPA Method 524.2 criteria.

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

ND = Not Detected

33 Dibromochloromethane

Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

ND

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1.0

μg/L

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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

Alpha Analytical Number: BMI11090105-02A

Client I.D. Number: MW-22-2

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Trichioropropane	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 (DBC	P) 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)	
32	1,3-Dichloropropane	ND	0.50	μg/L	- •		1	,,	
33	Dibromochloromethane	ND	0.50	μg/L					
24	4.0.0th(EDD)								

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soulur

ND

Dalter Herikour

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Waiter Hinchman, Quality Assurance Officer Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

μg/L

μg/L

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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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090105-03A

Client I.D. Number: MW-22-1

David Conner Attn:

Phone: (619) 726-7311

(614) 458-6641 Fax:

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 Repo		orting 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	Chiorobenzene	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 (DBC	P) 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-Methyi-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						

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl

ND

ND

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

1.0

0.50

μg/L

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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

Joh: 100006114/II

: 100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090105-04A

Client I.D. Number: EB-07-08/31/11

Attn: David Conner

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

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 L	imit
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-Chiorotoluene	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 (DBC	P) 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			1	, , , ,	
33	Dibromochloromethane	ND	0.50	µg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Sanbur

ND

Walter Findrer

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.

9/16/11

Report Date



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## **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090105-05A

Client I.D. Number: TB-07-08/31/11

Attn: David Conner

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

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 Li	imit
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	Bromochioromethane	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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soulmer

ND

Walter Arikan

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μg/L

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.

9/16/11

**Report Date** 



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## **VOC Sample Preservation Report**

Work Order: BMI11090105	Job:	100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН
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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<b>Date:</b> 13-Sep-11		(	QC S	ummai	y Repor	t				<b>Work Ord</b> 11090105	
Method Bla	nk		Type: N		Fest Code: E		hod 314.0	Δnalve	is Date	09/06/2011 12:48	
Sample ID:	MB-27248	Units : µg/L		_				Prep D		09/06/2011 12:48	
*	WD-21240	_	B01		C_3_110906/						01
Analyte		Result	PQL	Spkva	SpkRetval	%REC	LCL(ME)	UCL(ME)	RPDRefy	/al %RPD(Limit)	Qual
Perchlorate		ND	•	1							
Laboratory	Fortified Blank		Type: L	.FB 7	Fest Code: E	PA Met	hod 314.0				
File ID: <b>15</b>				E	Batch ID: <b>272</b>	48		Analys	is Date:	09/06/2011 13:06	
Sample ID:	LFB-27248	Units : µg/L		Run ID: IC	C_3_110906	4		Prep D	ate:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef	/al %RPD(Limit)	Qual
Perchlorate		24.4	2	2 25	i	98	85	115			
Sample Ma	trix Spike		Type: L	.FM 1	Fest Code: E	PA Met	thod 314.0				
File ID: <b>34</b>				E	Batch ID: 272	48		Analys	is Date:	09/06/2011 18:56	
Sample ID:	11090203-04ALFM	Units : µg/L		Run ID: IC	C_3_110906	4		Prep D	ate:	09/06/2011 11:51	
Analyte		Result	PQL	SpkVa	l SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		23.8	2	2 25	1.821	88	80	120			
Sample Ma	trix Spike Duplicate		Type: L	.FMD 7	Fest Code: E	PA Met	hod 314.0				
File ID: 35				E	Batch ID: <b>272</b>	48		Analys	is Date:	09/06/2011 19:14	
Sample ID:	11090203-04ALFMD	Units : µg/L	•	Run ID: IC	C_3_110906	4		Prep D	ate:	09/06/2011 11:51	
Analyte		Result	PQL				LCL(ME)	UCL(ME) F	RPDRef	/al %RPD(Limit)	Qual
Perchlorate		24.2	- 2	2 25	1.821	89	80	120	23.7	3 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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<b>Date:</b> 15-Sep-11	QC Summary Report	<b>Work Order:</b> 11090105
Method Blank File ID: 090611.B\070_M.D\	Type: MBLK Test Code: EPA Method 200.8  Batch ID: 27242 Analysis Date: 09	9/06/2011 19:29
Sample ID: MB-27242	Units: mg/L Run ID: ICP/MS_110906D Prep Date: 09	9/02/2011 18:05
Analyte	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal	%RPD(Limit) Qual
Chromium (Cr)	ND 0.005	
<b>Laboratory Control Spike</b>	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	9/02/2011 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	9/06/2011 20:04
Sample ID: 11083003-04AMS	Units: mg/L Run ID: ICP/MS_110906D Prep Date: 09	9/02/2011 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	9/06/2011 20:10
Sample ID: 11083003-04AMSD	Units: mg/L Run ID: ICP/MS_110906D Prep Date: 09	9/02/2011 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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Method Blank File ID: 11090706.D Sample ID: MBLK MS15W0907M Analyte		Type: MBLK	Test Code:	EDA Mash	- 1 014100			
Sample ID: MBLK MS15W0907M		. , , ,	rest Code.	EPA Weth	oa 24487	260B		
•			Batch ID: M	S15W0907	7M	Analysis Da	te: 09/07/2011 10:41	
Analyte	Units : µg/L	Run	ID: MSD_15_11	10907B		Prep Date:	09/07/2011 10:41	
widiyto	Result	PQL S	pkVal SpkRefV	al %REC	LCL(ME)	UCL(ME) RPDF	RefVal %RPD(Limit)	Qua
Dichlorodifluoromethane	ND	0.5			· · · · · · · · · · · · · · · · · · ·	<del></del>		
Chloromethane	ND	1						
/inyl chloride	ND	0.5						
Chloroethane	ND	0.5						
Bromomethane	ND	1						
richlorofluoromethane	ND	0.5						
l,1-Dichloroethene Dichloromethane	ND	0.5						
Freon-113	ND ND	1 0.5						
rans-1,2-Dichloroethene	ND	0.5						
Methyl tert-butyl ether (MTBE)	ND	0.5						
I,1-Dichloroethane	ND	0.5						
2-Butanone (MEK)	ND	10						
cis-1,2-Dichloroethene	ND	0.5						
Bromochloromethane	ND	0.5						
Chloroform 2,2-Dichloropropane	ND ND	0.5						
l.2-Dichloroptopane	ND ND	0.5 0.5						
1,1,1-Trichloroethane	ND ND	0.5 0.5						
I,1-Dichloropropene	ND	0.5						
Carbon tetrachloride	ND	0.5						
Benzene	ND	0.5						
Dibromomethane	ND	0.5						
,2-Dichloropropane	ND	0.5						
Trichloroethene	ND	0.5						
Bromodichloromethane	ND	0.5						
I-Methyl-2-pentanone (MIBK) sis-1,3-Dichloropropene	ND ND	2.5 0.5						
rans-1,3-Dichloropropene	ND ND	0.5						
,1,2-Trichloroethane	ND	0.5						
Toluene	ND	0.5						
,3-Dichloropropane	ND	0.5						
Dibromochloromethane	ND	0.5						
,2-Dibromoethane (EDB)	ND	1						
Tetrachloroethene I,1,1,2-Tetrachloroethane	ND	0.5						
h, i, i, z-retrachioroethane Chlorobenzene	ND	0.5						
Ethylbenzene	· ND ND	0.5 0.5						
n,p-Xylene	ND	0.5						
Bromoform	ND	0.5						
Styrene	ND	0.5						
-Xylene	ND	0.5						
,1,2,2-Tetrachloroethane	ND	0.5						
,2,3-Trichloropropane sopropylbenzene	ND	1						
sopropylbenzene Bromobenzene	ND ND	0.5						
n-Propylbenzene	ND ND	0.5 0.5						
-Chlorotoluene	ND ND	0.5 0.5						
-Chlorotoluene	ND	0.5						
,3,5-Trimethylbenzene	ND	0.5						
ert-Butylbenzene	ND	0.5						
,2,4-Trimethylbenzene	ND	0.5						
ec-Butylbenzene	ND	0.5						
,3-Dichlorobenzene	ND	0.5						
,4-Dichlorobenzene I-Isopropyltoluene	ND	0.5						
,2-Dichlorobenzene	ND ND	0.5					*	
-Butylbenzene	ND ND	0.5 0.5						
,2-Dibromo-3-chloropropane (DBCP)	ND ND	0.5 2.5						
,2,4-Trichlorobenzene	ND	1						
laphthalene	ND	i						
lexachlorobutadiene	ND	i						
,2,3-Trichlorobenzene	ND	1						
Surr: 1,2-Dichloroethane-d4 Surr: Toluene-d8	10.4 9.82		10 10	104 98	70 70	130 130		



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<b>Date:</b> 16-Sep-11	QC	<b>Work Order:</b> 11090105				
Surr: 4-Bromofluorobenzene	9.09	10	91	70	130	



Surr: Toluene-d8

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9.67



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<b>Date:</b> 16-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11090105
Surr: 4-Bromofluorobenzene	9.06	10	91	70	130	



Surr: Toluene-d8

### Alpha Analytical, Inc.

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Date: Work Order: QC Summary Report 16-Sep-11 Type: MS Sample Matrix Spike Test Code: EPA Method SW8260B File ID: 11090707.D Analysis Date: 09/07/2011 11:02 Batch ID: MS15W0907M Sample ID: 11090105-01AMS Units: µg/L Run ID: MSD\_15\_110907B Prep Date: 09/07/2011 11:02 Analyte PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Result Dichlorodifluoromethane 43.9 2.5 Chloromethane 57.2 Vinyl chloride 2.5 58.5 Chloroethane 56.9 2.5 Bromomethane O Trichlorofluoromethane 2.5 1,1-Dichloroethene 46.5 2.5 Dichloromethane 44.9 Freon-113 52.6 2.5 trans-1,2-Dichloroethene 47.3 2.5 Methyl tert-butyl ether (MTBE) 45.9 1.3 1.1-Dichloroethane 47.1 2.5 2-Butanone (MEK) n cis-1,2-Dichloroethene 47.7 2.5 Bromochloromethane 49.1 2.5 Chloroform 49.1 2.5 n 2,2-Dichloropropane 47.9 2.5 1,2-Dichloroethane 49.6 2.5 1,1,1-Trichloroethane 49.2 2.5 n 1,1-Dichloropropene 50.6 2.5 Carbon tetrachloride 49.3 2.5 Benzene 49.1 1.3 Dibromomethane 49.2 2.5 1,2-Dichloropropane 46.8 2.5 Trichloroethene 48.7 2.5 Bromodichloromethane 49.1 2.5 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene 46.1 2.5 trans-1,3-Dichloropropene 43.3 2.5 1,1,2-Trichloroethane 49.2 2.5 Toluene 1.3 1.3-Dichloropropane 45.7 2.5 Dibromochloromethane 42.5 2.5 1,2-Dibromoethane (EDB) 93.6 Tetrachloroethene 48.5 2.5 1,1,1,2-Tetrachloroethane 48.8 2.5 Chlorobenzene 47.4 2.5 Ethylbenzene 51.5 1.3 m,p-Xylene 1.3 Bromoform 41.2 Styrene 42.6 2.5 o-Xylene 1.3 1,1,2,2-Tetrachloroethane 43.7 2.5 1,2,3-Trichloropropane 94.3 Isopropylbenzene 2.5 Bromobenzene 47.5 2.5 n-Propylbenzene 48.1 2.5 4-Chlorotoluene 45.8 2.5 2-Chlorotoluene 45.6 2.5 1,3,5-Trimethylbenzene 49.3 2.5 tert-Butylbenzene 47.5 1,2,4-Trimethylbenzene 49.1 2.5 sec-Butylbenzene 47.2 2.5 1.3-Dichlorobenzene 49.7 1,4-Dichlorobenzene 45.6 2.5 4-Isopropyltoluene 2.5 1,2-Dichlorobenzene 44.8 2.5 n-Butylbenzene 51.3 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene Naphthalene 38.7 Hexachlorobutadiene 1,2,3-Trichlorobenzene 45.5 Surr: 1,2-Dichloroethane-d4 52.4 

48.2



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<b>Date:</b> 16-Sep-11	QC	Summary Rep	port			Work Order: 11090105
Surr: 4-Bromofluorobenzene	44.9	50	90	70	130	



Date:

### Alpha Analytical, Inc.

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Work Order:

**QC Summary Report** 16-Sep-11 11090105 Sample Matrix Spike Duplicate 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 Prep Date: 09/07/2011 11:24 Run ID: MSD 15 110907B Analyte Result **PQL** SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 51.4 138 15.7(33) 2.5 0 103 21 Chloromethane 65 10 50 0 130 23 144 57.18 12.9(27) Vinyl chloride 68 2.5 50 136 49 136 58.49 0 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 2.5 73.5 64.96 12.3(37) 50 0 147 32 154 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 0 119 55 52.58 12.6(40) 50 141 trans-1,2-Dichloroethene 54.6 2.5 50 0 109 63 130 47.34 14.3(20) Methyl tert-butyl ether (MTBE) 45.89 21.9(40) 57.2 1.3 50 0 114 47 150 1.1-Dichloroethane 54.3 2.5 50 Λ 109 66 130 47.12 14.1(20) 2-Butanone (MEK) 1030 851.7 19.1(22) 50 1000 0 103 23 182 cis-1,2-Dichloroethene 55.4 2.5 70 47.67 50 0 111 130 15.0(20) Bromochloromethane 57.4 2.5 50 0 70 132 49.1 15.5(20) 115 Chloroform 56.7 2.5 50 0 113 70 130 49.06 14.4(20) 2,2-Dichloropropane 16.6(22) 56.5 2.5 50 0 113 38 154 47.87 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 68 50.63 2.5 50 0 117 132 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 Λ 70 130 49.18 16.9(20) 50 117 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 49.11 57.4 2.5 0 50 157 50 115 15.5(20) 4-Methyl-2-pentanone (MIBK) 0 20 R5 152 13 125 122 182 123 21.3(20) 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 576 2.5 70 49.2 15.7(20) 50 0 115 131 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 O 68 131 50.04 12.7(20) 114 **Bromoform** 50.8 2.5 50 0 102 65 143 41.22 20.8(20) **R**5 Styrene 48.7 2.5 50 0 97 59 42.62 13.4(37) 153 o-Xvlene 56.6 1.3 50 n 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 45.97 10.0(20) 50 0 102 55 138 Bromobenzene 52.5 2.5 50 105 70 130 47.48 n 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 50 102 70 130 45.79 11.1(20) 2-Chlorotoluene 50.8 2.5 45.59 50 O 102 70 130 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 50 106 147 47.5 10.9(20) 55 1,2,4-Trimethylbenzene 54.8 2.5 50 110 O 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 45.63 11.8(20) 130 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 R5 0 110 64 130 220.3 21.8(20) 1.2.4-Trichlorobenzene 55.2 10 50 0 110 62 133 44.96 20.4(29) Naphthalene 50.7 10 50 101 32 166 38.71 26.8(40) Hexachlorobutadiene 126 10 126 63 105.8 100 0 130 17.7(21) 1.2.3-Trichlorobenzene 57.7 10 50 115 55 138 45.5 23.7(36) Surr: 1,2-Dichloroethane-d4 54.3 50 109



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Date:	QC:	<b>Work Order:</b> 11090105				
Surr: Toluene-d8	47.9	50	96	70	130	
Surr: 4-Bromofluorobenzene	44.5	50	89	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.

 $R5 = MS/MSD \ RPD$  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

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

WorkOrder: BMIS11090105

Page: 1 of 1

Report Attention Phone Number EMail Address

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

EDD Required: Yes

Sampled by : Chase Brogdon

100006114/JPL Groundwater Monitoring Cooler Temp Samples Received 01-Sep-2011 01-Sep-2011 Date Printed

Client's COC #: 25567

Job :

PO: 287215

San Diego, CA 92101

Suite 1420

Battelle Memorial Institute

655 West Broadway

Sample ID BMI11090105-05A TB-07-08/31/11 BMI11090105-04A EB-07-08/31/11 BMI11090105-03A MW-22-1 BMI11090105-02A MW-22-2 BMI11090105-01A MW-22-3 QC Level: DS4 Sample ID = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates AQ 08/31/11 08:53 Š å Matrix Date å Š 08/31/11 09:16 08/31/11 09:32 08/31/11 07:30 08/31/11 09:41 Collection No. of Bottles Alpha Sub TAT G G S 5 0 0 0 0 0 6 6 5 5 5 Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ Ç Ç Ç Ç VOC by 524 VOC by 524
Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524
Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC\_W Requested Tests Reno Trip Blank 6/7/11 Sample Remarks

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:	
Chapteth (edcox	Signature
Elizabeth Addox	Print Name
Alpha Analytical, Inc.	Company
9.1.11 1601	Date/Time

Billing Information:			mnles Collected From Which	State? OIRK?
165MALD	tomokins Alph	Alpha Analytical, Inc.	AZ CA X NV WA	
SS SOS KING ANE.		Nevada 89431-5778	OR OTHER	Page # 1 of
SUMBUS	(30)	Phone (775) 355-1044 Fax (775) 355-0406		
Phone Number Fax		//// /max:	Analyses Hequired	_
Client Name   DAVID CONNER.	P.O.# 287215	Job # 100000111		Required QC Level?
Address 990 OID TOWN AUG. C-205		TELLE. OPG	(200) TE	/ / = (3) v
000	Phone #6(9) 726-7311	8-6614 /	\ \(\rac{1}{2}\)	(EDA/EDF? YES NO
Time Date See Key Sampled by		Tota	-46	Global ID #
	Sample Description	TAT Field ** See below /	to	REMARKS
85 931/140 BMI 1109010501	mw - 22 - 3	_	X	
CO	mw - 22 - 2	77	X	
0941 8/31/m . 53	mw - 22 - 1	5= VARAION X	X	
087 8/31/1 130	- EB-07-08/31/11	302p X	X	Cay MAGIN BL
D. VIII 0620	75-07-08/31/1)	i X		This BLANK
ADDITIONAL INSTRUCTIONS:				
22				
Relinauished by	1		Company	
Received by	The # 8 Hu 7021	2) CARL TORKET CC	C. A.C.	19/2 1500
Relinquished by				
Received by In a both Iday Relinquished by	Elizabeth Hd	Cox Hipha	9.	1-11 1601
Received by				
'Key: AQ - Aqueous SO - Soil WA - Waste	ste OT - Other AR - Air **:	L-Liter V-Voa S-Soil Jar	O-Orbo T-Tedlar B-Brass	P-Plastic OT-Other

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.

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



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	

<b>Manually Integrated Analytes</b>
-------------------------------------

Alpha's Sample ID	Test Reference	<u>Analyte</u>
11090203-02A 11090203-03A 11090203-04A	EPA Method 314.0	Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate

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



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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: 09/02/11

Job: 100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography EPA Method 314.0

	<del></del>				
	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: <b>MW-21-5</b> Lab ID: BM111090203-01A Date Sampled 09/01/11 09:11	Perchlorate	2.58	1.00 μg/L	09/06/11 11:51	09/06/11 17:42
Client ID: MW-21-4 Lab ID: BMII 1090203-02A Date Sampled 09/01/11 09:33	Perchlorate	2.20	1.00 μg/L	09/06/11 11:51	09/06/11 18:01
Client ID: MW-21-3 Lab ID: BMI11090203-03A Date Sampled 09/01/11 09:54	Perchlorate	2.39	1.00 μg/L	09/06/11 11:51	09/06/11 18:19
Client ID: MW-21-2 Lab ID: BM111090203-04A Date Sampled 09/01/11 10:31	Perchlorate	1.82	1.00 μg/L	09/06/11 11:51	09/16/11 18:37
Client ID: <b>MW-21-1</b> Lab ID: BMI11090203-05A Date Sampled 09/01/11 10:58	Perchlorate	2.40	1.00 μg/L	09/06/11 11:51	09/06/11 19:33
Client ID: <b>EB-08-09/01/11</b> Lab ID: BMI11090203-06A Date Sampled 09/01/11 10:49	Perchlorate	ND	1.00 µg/L	09/06/11 11:51	09/06/11 19:51

ND = Not Detected

Roger Scholl Kandy Saulmer

Walter Hinkow

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



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### **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

Attn: D

David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

Date Received: 09/02/11

Job: 1000

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: BMII 1090203-01A Date Sampled 09/01/11 09:11	Chromium (Cr)	0.0058	0.0050 mg/L	09/06/11 14:00	09/07/11 00:25
Client ID: <b>MW-21-4</b> Lab ID: BM111090203-02A Date Sampled 09/01/11 09:33	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:31
Client ID: <b>MW-21-3</b> Lab ID: BMI11090203-03A Date Sampled 09/01/11 09:54	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 00:37
Client ID: MW-21-2 Lab ID: BMI11090203-04A Date Sampled 09/01/11 10:31	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:06
Client ID: <b>MW-21-1</b> Lab ID: BMI11090203-05A Date Sampled 09/01/11 10:58	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:12
Client ID: <b>EB-08-09/01/11</b> Lab ID: BMI11090203-06A Date Sampled 09/01/11 10:49	Chromium (Cr)	ND	0.0050 mg/L	09/06/11 14:00	09/07/11 01:18

ND = Not Detected

Roger Scholl Kar

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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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**Report Date** 



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

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

100006114/JPL Groundwater Monitoring

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

			Estimated	-	
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	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	2.0 μg/L	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	2.0 μg/L	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	2.0 μg/L	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	2.0 μg/L	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	2.0 μg/L	09/06/11 15:29	09/06/11 15:29
Client ID : <b>EB-08-09/01/11</b> Lab ID : BMI11090203-06A Date Received : 09/02/11 Date Sampled : 09/01/11 10:49	* * * None Found * * *	ND	2.0 μg/L	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	2.0 μg/L	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 Kandy San

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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.

9/16/11

Report Date



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-01A

Client I.D. Number: MW-21-5

Attn: David Conner Phone: (619) 726-7311

Fax:

(614) 458-6641

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 L	imit
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-Tetrachioroethane	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-isopropyitoluene	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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

µg/L

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.

9/16/11

Report Date



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-02A

Client I.D. Number: MW-21-4

**David Conner** Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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-Xvlene	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	Bromochioromethane	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 (DBC	P) 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			1	, ,	
33	Dibromochloromethane	ND	0.50	μg/L					
				. •					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

1.5

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

1.0

μg/L

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.

9/16/11 Report Date



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### ANALYTICAL REPORT

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-03A

Client I.D. Number: MW-21-3

David Conner Attn:

Phone: (619) 726-7311

Fax:

(614) 458-6641

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 L	imit
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	<b>5</b> 8	n-Butylbenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

μg/L

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.

9/16/11

Report Date



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-04A

Client I.D. Number: MW-21-2

Attn: **David Conner** 

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	mit
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 (DBC	P) ND	2.5	μg/L
25	Trichloroethene	ND	0.50	μg/L	60	1,2,4-Trichtorobenzene	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl

ND

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

μg/L

μg/L

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

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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

Alpha Analytical Number: BMI11090203-05A

Client I.D. Number: MW-21-1

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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	Bromoberizene	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	<b>5</b> 5	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 (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

1.0

μg/L

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.

9/16/11

Report Date



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-06A

Client I.D. Number: EB-08-09/01/11

**David Conner** Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
Dichlorodifluoromethane	ND	0.50	μg/L	36	1,1,1,2-Tetrachloroethane	ND	0.50	µg/L
Chloromethane	ND	1.0	μg/L	37	Chlorobenzene	ND	0.50	μg/L
Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	μg/L
Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	μg/L
Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	μg/L
Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	μg/L
1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xylene	ND	0.50	μg/L
Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	μg/L
Freon-113	ND	0.50	μg/L	44	1,2,3-Trichloropropane	ND	1.0	μg/L
trans-1,2-Dichloroethene	ND	0.50	μg/L	45	Isopropylbenzene	ND	0.50	μg/L
Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.50	μg/L
1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.50	μg/L
2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND	0.50	μg/L
cis-1,2-Dichloroethene	ND	0.50	μg/L	49	2-Chlorotoluene	ND	0.50	μg/L
Bromochloromethane	ND	0.50	μg/L	50	1,3,5-Trimethylbenzene	ND	0.50	μg/L
Chloroform	ND	0.50	μg/L	51	tert-Butylbenzene	ND	0.50	μg/L
2,2-Dichloropropane	ND	0.50	μg/L	52	1,2,4-Trimethylbenzene	ND	0.50	μg/L
1,2-Dichloroethane	ND	0.50	μg/L	53	sec-Butylbenzene	ND	0.50	μg/L
1,1,1-Trichloroethane	ND	0.50	μg/L	54	1,3-Dichlorobenzene	ND	0.50	μg/L
1,1-Dichloropropene	ND	0.50	μg/L	55	1,4-Dichlorobenzene	ND	0.50	μg/L
Carbon tetrachloride	ND	0.50	μg/L	56	4-Isopropyltoluene	ND	0.50	μg/L
Benzene	ND	0.50	μg/L	57	1,2-Dichlorobenzene	ND	0.50	μg/L
Dibromomethane	ND	0.50	μg/L	58	n-Butylbenzene	ND	0.50	μg/L
1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBC)	P) ND	2.5	μg/L
Trichloroethene	ND	0.50	μg/L	60	1,2,4-Trichlorobenzene	ND	1.0	μg/L
Bromodichloromethane	ND	0.50	μg/L	61	Naphthalene	ND	1.0	μg/L
4-Methyl-2-pentanone (MIBK)	ND	2.5	μg/L	62	Hexachlorobutadiene	ND	1.0	μg/L
cis-1,3-Dichloropropene	ND	0.50	µg/L	63	1,2,3-Trichlorobenzene	ND	1.0	μg/L
trans-1,3-Dichloropropene	ND	0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	111	(70-130)	%REC
1,1,2-Trichloroethane	ND	0.50		65	Surr: Toluene-d8	97	(70-130)	%REC
Toluene	ND	0.50	. •	66	Surr: 4-Bromofluorobenzene	86	(70-130)	%REC
	Dichlorodifluoromethane Chloromethane Vinyl chloride Chloroethane Bromomethane Trichlorofluoromethane 1,1-Dichloroethene Dichloromethane Freon-113 trans-1,2-Dichloroethene Methyl tert-butyl ether (MTBE) 1,1-Dichloroethane 2-Butanone (MEK) cis-1,2-Dichloroethene Bromochloromethane Chloroform 2,2-Dichloropropane 1,2-Dichloroethane 1,1,1-Trichloroethane 1,1,1-Trichloroethane 1,1-Dichloropropane 1,2-Dichloropropane Tichloroethane 1,1-Dichloropropane Carbon tetrachloride Benzene Dibromomethane 1,2-Dichloropropane Trichloroethene Bromodichloromethane 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene trans-1,3-Dichloropropene	Dichlorodifluoromethane Chloromethane Vinyl chloride Chloroethane Bromomethane Trichlorofluoromethane 1,1-Dichloroethene Dichloromethane Freon-113 Trans-1,2-Dichloroethene Mb Methyl tert-butyl ether (MTBE) ND 1,1-Dichloroethane ND Seromochloromethane ND Chloroform ND Bromochloromethane ND Chloroform ND Chloroform ND 1,2-Dichloroethene ND ND 1,1-Trichloroethane ND 1,1-Trichloroethane ND 1,1-Trichloroethane ND ND 1,1-Dichloropropene ND	Dichlorodifluoromethane         ND         0.50           Chloromethane         ND         1.0           Vinyl chloride         ND         0.50           Chloroethane         ND         0.50           Bromomethane         ND         1.0           Trichlorofluoromethane         ND         0.50           1,1-Dichloroethene         ND         0.50           Dichloromethane         ND         0.50           Dichloromethane         ND         0.50           Methyl tert-butyl ether (MTBE)         ND         0.50           Methyl tert-butyl ether (MTBE)         ND         0.50           1,1-Dichloroethane         ND         0.50           1,1-Dichloroethane         ND         0.50           2-Butanone (MEK)         ND         0.50           Bromochloromethane         ND         0.50           Bromochloromethane         ND         0.50           1,2-Dichloropropane         ND         0.50           1,1-Trichloroethane         ND         0.50           1,1-Dichloropropane         ND         0.50           1,1-Dichloropropane         ND         0.50           1,2-Dichloropropane         ND         0.50	Dichlorodifluoromethane         ND         0.50         µg/L           Chloromethane         ND         1.0         µg/L           Vinyl chloride         ND         0.50         µg/L           Chloroethane         ND         0.50         µg/L           Bromomethane         ND         1.0         µg/L           Trichlorofluoromethane         ND         0.50         µg/L           1,1-Dichloroethene         ND         0.50         µg/L           Freon-113         ND         0.50         µg/L           Itrans-1,2-Dichloroethene         ND         0.50         µg/L           Methyl tert-butyl ether (MTBE)         ND         0.50         µg/L           Methyl tert-butyl ether (MTBE)         ND         0.50         µg/L           1,1-Dichloroethane         ND         0.50         µg/L           1,1-Dichloroethane         ND         0.50         µg/L           2-Butanone (MEK)         ND         0.50         µg/L           Bromochloromethane         ND         0.50         µg/L           Bromochloromethane         ND         0.50         µg/L           1,1-Dichloropropene         ND         0.50         µg/L	Dichlorodifluoromethane         ND         0.50         µg/L         36           Chloromethane         ND         1.0         µg/L         37           Vinyl chloride         ND         0.50         µg/L         38           Chloroethane         ND         0.50         µg/L         40           Trichlorofluoromethane         ND         1.0         µg/L         40           Trichlorofluoromethane         ND         0.50         µg/L         41           1,1-Dichloroethane         ND         0.50         µg/L         42           Dichloromethane         ND         0.50         µg/L         43           Freon-113         ND         0.50         µg/L         43           Freon-113         ND         0.50         µg/L         43           Methyl tert-butyl ether (MTBE)         ND         0.50         µg/L         45           Methyl tert-butyl ether (MTBE)         ND         0.50         µg/L         46           1,1-Dichloroethane         ND         0.50         µg/L         47           2-Butanone (MEK)         ND         0.50         µg/L         48           Bromochloromethane         ND         0.50         µg	Dichlorodifluoromethane	Dichlorodifluoromethane	Dichlorodifluoromethane

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

33 Dibromochloromethane

1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA • (916)\ 366-9089\ /\ Las\ Vegas, NV • (702)\ 736-7522\ /\ Carson, CA • (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

μg/L

μg/L

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.

9/16/11

Report Date



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### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090203-07A

Client I.D. Number: TB-08-09/01/11

**David Conner** Attn: Phone: (619) 726-7311

(614) 458-6641 Fax:

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 L	imit
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 (DBC)	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

ND

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

μg/L

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.

9/16/11

Report Date



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### **VOC Sample Preservation Report**

Work Order: BMI11090203

Job:

100006114/JPL Groundwater Monitoring

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	

9/16/11



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<b>Date:</b> 13-Sep-11		(	QC S	umma	ry Repo	rt				<b>Work O</b> 110902	
Method Bla	nk		Type: N		Test Code: E Batch ID: 272		thod 314.0	Analys	sis Date:	09/06/2011 12:4	  8
Sample ID:	MB-27248	Units : µg/L		Run ID: I	C_3_110906	Α		Prep D	Date:	09/06/2011 11:5	i1
Analyte		Result	PQL	SpkVa	l SpkRefVa	%REC	C LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		ND	•	1							
Laboratory File ID: 15	Fortified Blank		Type: L		Test Code: E Batch ID: 272		thod 314.0	Analys	sis Date:	09/06/2011 13:0	)6
Sample ID:	LFB-27248	Units : µg/L		Run ID: I	C_3_110906	A		Prep D	Date:	09/06/2011 11:5	<b>i</b> 1
Analyte		Result	PQL	SpkVa	l SpkRefVa	%REC	C LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		24.4	2	2 2	5	98	85	115			
Sample Mat	trix Spike		Type: L	.FM	Test Code: E	PA Me	thod 314.0				
File ID: 34					Batch ID: <b>27</b> 2	48		Analys	sis Date:	09/06/2011 18:	6
Sample ID:	11090203-04ALFM	Units : µg/L		Run ID: I	C_3_110906	A		Prep D	Date:	09/06/2011 11:	1
Analyte		Result	PQL	SpkVa	l SpkRefVa	%REC	LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		23.8	2	2 2	5 1.821	88	80	120	,		
Sample Mat	trix Spike Duplicate		Type: L	-FMD	Test Code: E	PA Me	thod 314.0				
File ID: 35	•			1	Batch ID: <b>27</b> 2	48		Analys	sis Date:	09/06/2011 19:1	4
Sample ID:	11090203-04ALFMD	Units : µg/L		Run ID: I	C_3_110906	A		Prep D	Date:	09/06/2011 11:5	<b>i</b> 1
Analyte		Result	PQL	SpkVa	l SpkRefVa	%REC	C LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		24.2	2	2 2	5 1.821	89	80	120	23. <b>7</b>	8 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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<b>Date:</b> 15-Sep-11	QC Summary Report Work C	
Method Blank File ID: 090611.B\105_M.D\ Sample ID: MB-27253	Type: MBLK Test Code: EPA Method 200.8  Batch ID: 27253 Analysis Date: 09/06/2011 22:  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 File ID: 090611.B\106_M.D\ Sample ID: LCS-27253	Type: LCS Test Code: EPA Method 200.8  Batch ID: 27253 Analysis Date: 09/06/2011 23:  Units: mg/L Run ID: ICP/MS 110906E Prep Date: 09/06/2011 14:	
Analyte	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit	
Chromium (Cr)	0.0502	<u>,                                     </u>
Sample Matrix Spike File ID: 090611.B\111_M.D\ Sample ID: 11083104-08AMS	Type: MS Test Code: EPA Method 200.8  Batch ID: 27253 Analysis Date: 09/06/2011 23:  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 File ID: 090611.B\112_M.D\	Type: MSD Test Code: EPA Method 200.8  Batch ID: 27253 Analysis Date: 09/06/2011 23:	<b>3</b> 7
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: 16-Sep-11	(	<b>Work Order</b> 11090203	<b>Work Order:</b> 11090203		
Method Blank		Type: MBLK	Test Code: EPA Method SW82	260B	
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 S	pkVal SpkRefVal %REC LCL(ME)	UCL(ME) RPDRefVal %RPD(Limit)	Qua
Dichlorodifluoromethane	ND	0.5			_
Chloromethane	ND	1			
Vinyl chloride	ND	0.5			
Chloroethane	ND	0.5			
Bromomethane	ND	1			
Trichlorofluoromethane 1,1-Dichloroethene	ND	0.5			
Dichloromethane	ND ND	0.5			
Freon-113	ND ND	1 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 1,2-Dichloroethane	ND	0.5			
1,1,1-Trichloroethane	ND	0.5			
1,1-Dichloropropene	ND ND	0.5 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 trans-1,3-Dichloropropene	ND	0.5			
1,1,2-Trichloroethane	ND ND	0.5			
Toluene	ND ND	0.5 0.5			
1,3-Dichloropropane	ND 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 Promoform	ND	0.5			
Bromoform Styrene	ND	0.5			
o-Xylene	ND ND	0.5			
1,1,2,2-Tetrachloroethane	ND ND	0.5 0.5			
1,2,3-Trichloropropane	ND ND	0.5 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 sec-Butylbenzene	ND ND	0.5			
1,3-Dichlorobenzene	ND ND	0.5 0.5			
1,4-Dichlorobenzene	ND	0.5 0.5			
4-Isopropyltoluene	ND 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		400	
Surr: 1,2-Dichloroethane-d4 Surr: Toluene-d8	10.5		10 105 70	130	
our, rolucite-do	9.89		10 99 70	130	



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<b>Date:</b> 16-Sep-11	QC	Summary Rep	port			<b>Work Order:</b> 11090203
Surr: 4-Bromofluorobenzene	8.76	10	88	70	130	



Date:

### Alpha Analytical, Inc.

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Work Order:

**QC Summary Report** 16-Sep-11 Type: LCS Test Code: EPA Method SW8260B Laboratory Control Spike File ID: 11090604.D Analysis Date: 09/06/2011 09:29 Batch ID: MS15W0906M Sample ID: LCS MS15W0906M 09/06/2011 09:29 Units: µg/L Run ID: MSD\_15\_110906A Prep Date: Analyte Result **PQL** SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 8.53 Chloromethane 11.2 Vinyl chloride 10.3 Chloroethane 11.9 Bromomethane 7.6 Trichlorofluoromethane 12.6 1,1-Dichloroethene 9.62 Dichloromethane 9.55 Freon-113 10.6 trans-1,2-Dichloroethene 9.97 99.7 Methyl tert-butyl ether (MTBE) 0.5 10.1 1.1-Dichloroethane 9.92 2-Butanone (MEK) L51 130(130) cis-1,2-Dichloroethene Bromochloromethane 10.4 Chloroform 10.2 2,2-Dichloropropane 10.2 1,2-Dichloroethane 10.5 1.1.1-Trichloroethane 10.4 1,1-Dichloropropene 10.6 Carbon tetrachloride 10.2 Benzene 10.3 0.5 Dibromomethane 10.5 1,2-Dichloropropane 9.75 Trichloroethene 10.2 Bromodichloromethane 10.5 4-Methyl-2-pentanone (MIBK) 28.8 2.5 cis-1,3-Dichloropropene 10.1 trans-1,3-Dichloropropene 9.39 1,1,2-Trichloroethane 10.5 9.96 0.5 99.6 1,3-Dichloropropane 9.73 Dibromochloromethane 9.09 1,2-Dibromoethane (EDB) 19.7 Tetrachloroethene 9.97 99.7 1,1,1,2-Tetrachloroethane 10.3 Chlorobenzene 9.73 Ethylbenzene 10.7 0.5 m.p-Xylene 10.4 0.5 **Bromoform** 9.2 Styrene 8.86 o-Xylene 0.5 10.4 1,1,2,2-Tetrachloroethane 9.34 1,2,3-Trichloropropane 20.1 Isopropylbenzene 9.46 Bromobenzene 9.76 n-Propylbenzene 9.78 4-Chlorotoluene 9.48 2-Chlorotoluene 9.39 1,3,5-Trimethylbenzene 10.1 tert-Butylbenzene 9.79 1.2,4-Trimethylbenzene 10.2 sec-Butylbenzene 9.64 1,3-Dichlorobenzene 10.3 1,4-Dichlorobenzene 9.39 4-Isopropyltoluene 10.1 1,2-Dichlorobenzene 9.42 n-Butylbenzene 10.5 1,2-Dibromo-3-chloropropane (DBCP) 49.1 1,2,4-Trichlorobenzene 9.36 Naphthalene 8.56 Hexachlorobutadiene 21.3 1.2.3-Trichlorobenzene Surr: 1,2-Dichloroethane-d4 10.5 Surr: Toluene-d8 9.57 



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<b>Date:</b> 16-Sep-11	QC	Summary Rep	port			Work Order: 11090203
Surr: 4-Bromofluorobenzene	9.17	10	92	70	130	



Date:

### Alpha Analytical, Inc.

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

Work Order: **QC Summary Report** 16-Sep-11 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 09/06/2011 10:48 Units: µg/L Run ID: MSD\_15\_110906A Prep Date: Analyte Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 34.6 2.5 Chloromethane 48.5 Vinvl chloride 51.1 2.5 Chloroethane 53.4 2.5 O Bromomethane 37.6 Trichlorofluoromethane 2.5 1,1-Dichloroethene 44.4 2.5 Dichloromethane Freon-113 50.6 2.5 trans-1,2-Dichloroethene 45.6 2.5 Methyl tert-butyl ether (MTBE) 48.6 1.3 1,1-Dichloroethane 45.6 2.5 2-Butanone (MEK) cis-1.2-Dichloroethene 46.9 2.5 Bromochloromethane 2.5 48.3 Chloroform 50.8 2.5 2.66 2,2-Dichloropropane 46.2 2.5 1,2-Dichloroethane 2.5 O 1.1.1-Trichloroethane 2.5 1,1-Dichloropropene 48.9 2.5 Carbon tetrachloride 48.1 2.5 Benzene 47.5 1.3 Dibromomethane 49.9 2.5 99.7 1,2-Dichloropropane 45.7 2.5 Trichloroethene 46.9 2.5 Bromodichloromethane 48.8 2.5 4-Methyl-2-pentanone (MIBK) cis-1.3-Dichloropropene 2.5 trans-1,3-Dichloropropene 43.3 2.5 1,1,2-Trichloroethane 49.2 2.5 Toluene 45.1 1.3 1,3-Dichloropropane 45.5 2.5 Dibromochloromethane 42.5 2.5 1,2-Dibromoethane (EDB) 92.1 Tetrachloroethene 2.5 2.17 1,1,1,2-Tetrachloroethane 2.5 Chlorobenzene 44.9 2.5 O Ethylbenzene 48.3 1.3 m.p-Xvlene 47.4 **Bromoform** 43.2 2.5 n Styrene 40.7 2.5 o-Xvlene 47.1 1.3 1,1,2,2-Tetrachloroethane 45 4 2.5 1,2,3-Trichloropropane 96.8 Isopropylbenzene 43.3 2.5 Bromobenzene 45.3 2.5 n n-Propylbenzene 44.8 4-Chlorotoluene 43.5 2.5 2-Chlorotoluene 42.9 2.5 1.3.5-Trimethylbenzene 46.6 2.5 tert-Butylbenzene 45.1 2.5 1,2,4-Trimethylbenzene 46.4 2.5 sec-Butylbenzene 44.7 2.5 1,3-Dichlorobenzene 47.2 2.5 1.4-Dichlorobenzene 43.6 2.5 4-Isopropyltoluene 46.6 2.5 1,2-Dichlorobenzene 43.6 2.5 n-Butylbenzene 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene 43.4 Naphthalene 39.9 Hexachlorobutadiene 1.2.3-Trichlorobenzene 45.2 Surr: 1,2-Dichloroethane-d4 54.4 Surr: Toluene-d8 47.2 



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<b>Date:</b>	QC	Summary Re	port			Work Order: 11090203
Surr: 4-Bromofluorobenzene	46.2	50	92	70	130	



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

Date: Work Order: QC Summary Report 16-Sep-11 11090203 Sample Matrix Spike Duplicate Type: MSD Test Code: EPA Method SW8260B File ID: 11090608.D Analysis Date: 09/06/2011 11:10 Batch ID: MS15W0906M Sample ID: 11090203-04AMSD 09/06/2011 11:10 Units: µg/L Run ID: MSD\_15\_110906A Prep Date: Analyte Result **PQL** SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 35.3 2.5 138 34.57 2.2(33)Chloromethane 98 48.53 49.1 10 50 0 23 144 1.2(27)Vinvl chloride 54 2.5 50 0 108 49 136 51.13 5.4(21) Chloroethane 56.7 21 6.0(40)2.5 50 113 159 53.38 Bromomethane 42.4 10 50 0 85 10 174 37.64 12.0(40) Trichlorofluoromethane 61.4 2.5 32 154 59.95 50 O 123 2.5(37)1.1-Dichloroethene 46.2 50 92 64 130 44.35 4.1(21) Dichloromethane 69 3.5(20) 45.6 50 0 91 10 130 44 Freon-113 51.4 2.5 50 0 103 55 141 50.58 1.6(40)trans-1,2-Dichloroethene 47.9 96 63 130 45.58 5.0(20)2.5 50 0 Methyl tert-butyl ether (MTBE) 50.3 101 47 150 48.56 3.5(40) 1.3 50 0 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 70 48 7 2.5 50 0 97 130 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 98 38 46.19 50 0 154 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 0 102 68 48.92 2.5 50 132 3.9(20)Carbon tetrachloride 50.5 2.5 50 0 101 58 148 48.08 4.8(20)Benzene 59 98 138 47.52 49 1.3 50 0 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 70 131 45.7 2.7(20)94 Trichloroethene 48.4 0 97 65 46.93 2.5 50 144 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 45.14 47.6 50 0 95 68 130 1.3 5.3(20) 1,3-Dichloropropane 46.6 0 93 45.46 2.5 50 70 130 2.4(20)Dibromochloromethane 44.1 2.5 88 42.48 50 0 42 155 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 98 70 49 2.5 50 0 130 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 13 50 n 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 0 50 Q8 70 47,08 1.3 130 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 91 0 55 138 43.34 4.4(20)50 Bromobenzene 47.3 2.5 50 0 95 70 130 45.25 4.5(20)n-Propylbenzene 2.5 0 94 47 50 67 133 44.76 4.9(30)4-Chlorotoluene 45.3 2.5 0 91 70 43.54 4.0(20)50 130 2-Chlorotoluene 44.9 2.5 50 0 90 70 130 42.89 4.7(20)1,3,5-Trimethylbenzene 48 4 2.5 97 67 46.61 3.7(21) 50 0 134 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 0 49.3 2.5 50 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 4.0(20) 48.5 0 97 46.6 2.5 50 68 132 1.2-Dichlorobenzene 0 90 70 43.59 45.1 50 130 3.3(20)n-Butylbenzene 0 101 62 48.03 50.4 2.5 50 134 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 R 32 39.91 9.2(40)10 50 0 88 166 Hexachlorobutadiene 108 10 100 0 108 63 130 99.01 8.6(21) 1.2.3-Trichlorobenzene 49.8 50 0 99.5 55 138 45.24 9.5(36)Surr: 1,2-Dichloroethane-d4 53.1 70 50 106 130 Surr: Toluene-d8

130

48.2



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Date: 16-Sep-11  QC Summary Report						<b>Work Order:</b> 11090203
Surr: 4-Bromofluorobenzene	45.7	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

## Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778

TEL: (775) 355-1044 FAX: (775) 355-0406

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

EDD Required: Yes

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

WorkOrder: BMIS11090203

Page: 1 of 1

Sampled by: Chase Brogdon Cooler Temp Samples Received

02-Sep-2011 02-Sep-2011 **Date Printed** 

Client's COC #: 25566 QC Level: DS4 DOD QC Required: Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates 100006114/JPL Groundwater Monitoring PO: 287215

San Diego, CA 92101

Suite 1420

Battelle Memorial Institute

655 West Broadway

Sample ID BMI11090203-07A TB-08-09/01/11 BMI11090203-06A EB-08-09/01/11 BMI11090203-05A MW-21-1 BMI11090203-04A MW-21-2 BMI11090203-03A MW-21-3 BMI11090203-02A MW-21-4 BMI11090203-01A MW-21-5 Client Sample ID å ò Š å å å Matrix Date AQ 09/01/11 09:11 09/01/11 07:30 09/01/11 09:33 09/01/11 10:49 09/01/11 10:31 Collection No. of Bottles 09/01/11 10:58 09/01/11 09:54 Alpha Sub G ú S 6 თ თ 0 0 0 0 0 0 0 TAT 9 ဖ 9 9 9 9 ဖ Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314 W METALS\_D VOC\_TIC\_ Ç Ç Ç Ç Ö Ç VOC by 524 VOC by 524 Criteria Criteria VOC\_W Requested Tests Reno Trip Blank 4/6/11 Sample Remarks Level IV QC Level IV QC MS/MSD

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:	
Chapterth Idcox	Signature
Elizabuth Hdcox	Print Name
Alpha Analytical, Inc.	Company
9211 1050	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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. 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

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g information:		Alpha Analytical, Inc.	AZ CA X NV WA		V0000
Address SOS KING AVE.		Sparks, Nevada 89431-5778	ID OR 0	OTHER Page #	of
te, Zip Columbus, ott	43201	Phone (775) 355-1044  Fax (775) 355-0406			
Phone Number Fax		1100011	✓ / Analyses	Analyses Hequired /	
Client Name BATTELLE / DAVID CONNER		4 do 6 do	).8)	/ / / Requir	Required QC Level?
D rown A	EMail Address	,	524 200 116 (314	/ / / / / /	11 (II) IV
City, State, Zip SAN DIEGO, CA 92110		Fax # (414) 458-6614	C R	EDD / EDF? YES	YESNO
Time Date See Key See Key	Report Attention	, 읈	000	Global ID #	
Lab ID Num	Sample Description	TAT Filtered ** See below	V 10	/ REM	REMARKS
911 9/01/1/10 BMT 11090203-01	1 MW - 21 - 5	North S-variant	Υ,	1 1500 I	Iac
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ADDITIONAL INSTRUCTIONS:					
Signature	Print Name		Company	Date	Time
Relinquished by	- CHASE BURSON	Dr.Satt	BEZ, THE	09/01/11	1145
Received by	Anthon Stalk	K Aph-	Austical	6/1/2	9/1/
Relinquished by	'		6	9/1/4	0/161
Received by Impath (dox)	Elizabuth F	Jd Cox	Alpha	9.2.11	1050
Received by					
*Key: AQ - Aqueous SO - Soil WA - Waste	aste OT - Other AR - Air	**: L-Liter V-Voa S-Soil Jar	ar O-Orbo T-Tedlar	B-Brass P-Plastic	OT-Other

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.

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



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

**Suite 1420** 

**CASE NARRATIVE** 

Job:

100006114/JPL Groundwater Monitoring

Work Order:

(619) 726-7311

BMI11090622

**Cooler Temp:** 

 $0^{\circ}C$ 

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	Aqueou

### Manually Integrated Analytes

	The state of the s	12/100	
Alpha's Sample ID	Test Reference	Analyte	
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/Chainof-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.

1 of 1



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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: 09/03/11

Job:

100006114/JPL Groundwater Monitoring

### Perchlorate by Ion Chromatography

EPA Method 314.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-20-5 Lab ID: BM111090622-01A Date Sampled 09/02/11 08:46	Perchlorate	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 Date Sampled 09/02/11 09:20	Perchlorate	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 Date Sampled 09/02/11 09:47	Perchlorate	ND	1.00 µg/L	09/12/11 15:22	09/12/11 17:50
Client ID: MW-20-2 Lab ID: BM111090622-04A Date Sampled 09/02/11 10:12	Perchlorate	2.50	1.00 μg/L	09/12/11 15:22	09/12/11 18:08
Client ID: MW-20-1 Lab ID: BM111090622-05A Date Sampled 09/02/11 10:33	Perchlorate	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: BMI11090622-06A Date Sampled 09/02/11 00:00	Perchlorate	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: BMI11090622-07A Date Sampled 09/02/11 10:23	Perchlorate	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

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.

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: 09/03/11

Job:

100006114/JPL Groundwater Monitoring

Metals by ICPMS EPA Method 200.8

	Parameter	Concentration	Reporting	Date	Date
			Limit	Extracted	Analyzed
Client ID: MW-20-5 Lab ID: BMI11090622-01A Date Sampled 09/02/11 08:46	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-4</b> Lab ID: BMI11090622-02A Date Sampled 09/02/11 09:20	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>MW-20-3</b> Lab ID: BM111090622-03A Date Sampled 09/02/11 09:47	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: MW-20-2 Lab ID: BMI11090622-04A Date Sampled 09/02/11 10:12	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: MW-20-1 Lab ID: BM111090622-05A Date Sampled 09/02/11 10:33	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11
Client ID: <b>DUPE-04-3Q11</b> Lab ID: BMI11090622-06A Date Sampled 09/02/11 00:00	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/17/11
Client ID: <b>EB-09-09/02/11</b> Lab ID: BMI11090622-07A Date Sampled 09/02/11 10:23	Chromium (Cr)	ND	0.0050 mg/L	09/09/11	09/12/11

ND = Not Detected

Roger Scholl Kundy Saula

Walter Airihm

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.

9/20/11
Report Date



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job: 100006114/JPI

100006114/JPL Groundwater Monitoring

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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

			Estimated	
	Parameter	Estimated	Reporting	Date Date
		Concentration	Limit	Extracted Analyzed
Client ID: MW-20-5  Lab ID: BMI11090622-01A  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: MW-20-4 Lab ID: BMI11090622-02A 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: MW-20-3  Lab ID: BMI11090622-03A  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: MW-20-2  Lab ID: BMI11090622-04A  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 : MW-20-1  Lab ID : BMI11090622-05A  Date Received : 09/03/11  Date Sampled : 09/02/11 10:33	Sulfur dioxide	4.3	2.0 μ <b>g</b> /L	09/07/11 17:52 09/07/11 17:52
Client ID : <b>DUPE-04-3Q11</b> Lab ID : BMI11090622-06A  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: EB-09-09/02/11 Lab ID: BMI11090622-07A Date Received: 09/03/11 Date Sampled: 09/02/11 10:23	* * * None Found * * *	ND	2.0 μ <b>g</b> /L	09/07/11 12:50 09/07/11 12:50
Client ID: TB-09-09/02/11 Lab ID: BMI11090622-08A Date Received: 09/03/11	* * * None Found * * *	ND	2.0 μ <b>g</b> /L	09/07/11 13:11 09/07/11 13:11

Date Sampled: 09/02/11 07:00



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Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Kandy San

Walter Hirkman

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



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### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-01A

Client I.D. Number: MW-20-5

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

(614) 458-6641

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 Li	imit
1	Dichlorodifluoromethane	ND	0.50	μg/L	36	1,1,1,2-Tetrachioroethane	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 (DBC	P) 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					
0.4	4.0 BH	1							

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

ND

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1.0

μg/L

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9/19/11

Report Date



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

ob: 100006114/IPI

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-02A

Client I.D. Number: MW-20-4

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 Li	mit
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 (DBC	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl Kandy Soulmen

ND

Walter Findrer

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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9/19/11

**Report Date** 



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-03A

Client I.D. Number: MW-20-3

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 Li	imit
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 (DBC	P) 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	Hexachiorobutadiene	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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

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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9/19/11

**Report Date** 



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-04A

Client I.D. Number: MW-20-2

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 Li	mit
1	Dichlorodifluoromethane	ND	0.50	μg/L	36	1,1,1,2-Tetrachloroethane	ND	0.50	μg/L
2	Chioromethane	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-Xvlene	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	Bromochioromethane	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 (DBCI	P) 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			'	,	

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

33 Dibromochloromethane

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

0.50

μg/L

μg/L

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

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9/19/11

Report Date



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

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-05A

Client I.D. Number: MW-20-1

Attn: David Conner

Phone: (619) 726-7311

Fax:

(614) 458-6641

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 Li	imit
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-Chiorotoluene	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 (DBC	P) 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	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Soulun

ND

Walter Arrihour

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



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-06A

Client I.D. Number: DUPE-04-3Q11

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
1	Dichlorodifluoromethane	ND	0.50	µg/L	36	1,1,1,2-Tetrachioroethane	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-Xvlene	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-Chiorotoluene	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 (DBC)	P) 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-pentanorie (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			1	, ,	
33	Dibromochloromethane	ND	0.50	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl Kandy Sulm

ND

Walter Hirihow

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

μg/L

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9/19/11

Report Date



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

Alpha Analytical Number: BMI11090622-07A

Client I.D. Number: EB-09-09/02/11

David Conner Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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 (DBCI	P) 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			, 55	(	, , , , , , ,
33	Dibromochloromethane	ND	0.50	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

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

μg/L

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9/19/11

Report Date



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### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job:

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090622-08A

Client I.D. Number: TB-09-09/02/11

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 Li	mit
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-Xvlene	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-Xvlene	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 (DBC)	P) ND	2.5	μg/L
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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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl Kandy Soulur

ND

ND

Walter Hinkow

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

μg/L

μg/L

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** 



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

Alpha's Sample ID	Client's Sample ID	Matrix	pН
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

9/19/11



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

<b>Date:</b> 21-Sep-11		(	QC S	ummar	y Repor	t				Work Ord 11090622	
Method Bla	nk		Type N		est Code: El		thod 314.0	Analy	/sis Date:	09/12/2011 16:18	
Sample ID:	MB-27294	Units : µg/L		Run ID: IC	3_110912			Prep	Date:	09/12/2011 15:22	
Analyte		Result	PQL				LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		ND		1							
Laboratory	Fortified Blank		Type L	.FB T	est Code: El	PA Met	thod 314.0				
File ID: <b>15</b>				В	atch ID: <b>272</b> 9	94		Analy	/sis Date:	09/12/2011 16:36	
Sample ID:	LFB-27294	Units : µg/L		Run ID: IC	_3_1109124	١		Prep	Date:	09/12/2011 15:22	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		24.3	2	2 25		97	85	115			
Sample Ma	trix Spike		Type L	.FM T	est Code: El	A Me	thod 314.0				
File ID: <b>31</b>				В	atch ID: 2729	94		Analy	/sis Date:	09/12/2011 21:31	
Sample ID:	11090825-05ALFM	Units : µg/L		Run ID: IC	_3_110912 <i>A</i>	١		Prep	Date:	09/12/2011 15:22	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate	_	26.6	2	2 25	0	106	80	120			
Sample Ma	rix Spike Duplicate		Type L	FMD T	est Code: EF	A Met	thod 314.0				
File ID: <b>32</b>				В	atch ID: <b>272</b> 9	94		Analy	sis Date:	09/12/2011 21:49	
Sample ID:	11090825-05ALFMD	Units : µg/L		Run ID: IC	_3_110912 <i>A</i>	١		Prep	Date:	09/12/2011 15:22	
Analyte		Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRef	Val %RPD(Limit)	Qual
Perchlorate		23.2	2	2 25	0	93	80	120	26.6	3 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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<b>Date:</b> 21-Sep-11	I II Silinmary Report	rk Order: 1090622
Method Blank File ID: 091211.B\019_M.D\ Sample ID: MB-27282	Type: <b>MBLK</b> Test Code: <b>EPA Method 200.8</b> Batch ID: <b>27282</b> Analysis Date: <b>09/12/2011</b> Units: <b>mg/L</b> Run ID: <b>ICP/MS_110912A</b> Prep Date: <b>09/09/2011</b>	
Analyte	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(I	_imit) Qual
Chromium (Cr)	ND 0.005	
Laboratory Control Spike File ID: 091211.B\020_M.D\	Type: LCS Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/2011	14:15
Sample ID: LCS-27282 Analyte	Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/2011  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(I	
Chromium (Cr)	0.0508	<del></del>
Sample Matrix Spike File ID: 091211.B\025_M.D\ Sample ID: 11090825-05AMS Analyte	Type: MS Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/2011  Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/2011  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(L	11:02
Chromium (Cr)	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(L 0.051 0.005 0.05 0 102 70 130	<u>imit)</u> Qual
Sample Matrix Spike Duplicate File ID: 091211.B\026_M.D\	Type: MSD Test Code: EPA Method 200.8  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(L	imit) 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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<b>Date:</b> 19-Sep-11	QC Summary Report				<b>Work Order:</b> 11090622			
Method Blank		Type: MBLK	Test Code: EPA Metho	od SW8260B		-		
File ID: 11090706.D			Batch ID: MS15W0907	M Analysis Da	te: 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		kVai SpkRefVal %REC L	.CL(ME) UCL(ME) RPDR	RefVal %RPD(Limit) Q	)ua		
Dichlorodifluoromethane	ND	0.5			· · · · · · · · · · · · · · · · · · ·	-		
Chloromethane	ND	0.3						
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 Methyl tert-butyl ether (MTBE)	ND ND	0.5						
1,1-Dichloroethane	ND ND	0.5 0.5						
2-Butanone (MEK)	ND 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) cis-1,3-Dichloropropene	ND	2.5						
trans-1,3-Dichloropropene	ND ND	0.5 0.5						
1,1,2-Trichloroethane	ND 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 1,1,2,2-Tetrachloroethane	ND	0.5						
1,2,3-Trichloropropane	ND	0.5						
Isopropylbenzene	ND ND	1 0.5						
Bromobenzene	ND ND	0.5 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 Hexachlorobutadiene	ND ND	1						
1,2,3-Trichlorobenzene	ND ND	1						
Surr: 1,2-Dichloroethane-d4	ND 10.4	1	10 104	70 130				
Surr: Toluene-d8	9.82		10 104 10 98	70 130 70 130				
Tall relating ag	₹.02		10 90	70 130				



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Surr: Toluene-d8

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Date: Work Order: **QC Summary Report** 19-Sep-11 Laboratory Control Spike Test Code: EPA Method SW8260B File ID: 11090704.D Analysis Date: 09/07/2011 09:46 Batch ID: MS15W0907M Sample ID: LCS MS15W0907M Units: µg/L Prep Date: 09/07/2011 09:46 Run ID: MSD\_15\_110907B Analyte SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Result **PQL** Qual Dichlorodifluoromethane 7.21 Chloromethane 10.1 Vinyl chloride 9.44 Chloroethane 11.7 Bromomethane 7.52 Trichlorofluoromethane 12.6 1,1-Dichloroethene 9.35 Dichloromethane 9.14 Freon-113 10.2 trans-1,2-Dichloroethene 9.67 Methyl tert-butyl ether (MTBE) 9.55 0.5 1.1-Dichloroethane 9.57 2-Butanone (MEK) cis-1,2-Dichloroethene 9.74 Bromochioromethane 9.99 99.9 Chloroform 9.96 99.6 2,2-Dichloropropane 9.63 1,2-Dichloroethane 10.3 1.1.1-Trichloroethane 10.1 1,1-Dichloropropene 10.3 Carbon tetrachloride 9.76 Benzene 9.99 0.5 99.9 Dibromomethane 10.2 1,2-Dichloropropane 9.63 Trichloroethene 9.91 Bromodichloromethane 10.1 4-Methyl-2-pentanone (MIBK) 26.6 2.5 cis-1,3-Dichloropropene 9.71 trans-1,3-Dichloropropene 9.1 1.1.2-Trichloroethane 10.4 Toluene 9 91 0.5 1,3-Dichloropropane 9.67 Dibromochloromethane 8.87 1,2-Dibromoethane (EDB) 19.8 Tetrachloroethene 9.93 1,1,1,2-Tetrachloroethane 10.2 Chlorobenzene 9.8 Ethylbenzene 10.7 0.5 m,p-Xylene 10.5 0.5 **Bromoform** 8.87 Styrene 8.91 o-Xylene 10.4 0.5 1,1,2,2-Tetrachloroethane 9.34 1,2,3-Trichloropropane 20.1 Isopropylbenzene 9.43 Bromobenzene 9.66 n-Propvibenzene 9.73 4-Chlorotoluene 9.38 2-Chlorotoluene 9.35 1,3,5-Trimethylbenzene 9.99 99.9 tert-Butylbenzene 9.69 1,2,4-Trimethylbenzene sec-Butylbenzene 9.58 1.3-Dichlorobenzene 10.1 1,4-Dichlorobenzene 9.38 4-Isopropyltoluene 1.2-Dichlorobenzene 9.23 n-Butylbenzene 10.3 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene 8.89 Naphthalene 7.8 Hexachlorobutadiene 20.5 1,2,3-Trichlorobenzene 8.97 Surr: 1,2-Dichloroethane-d4 10.3 

9.67



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<b>Date:</b> 19-Sep-11	QC	Summary Rep	ort			<b>Work Order:</b> 11090622
Surr: 4-Bromofluorobenzene	9.06	10	91	70	130	



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Date:
19-Sep-11

QC Summary Report

Work Order:
11090622

Sample Matrix Spike		Type: M				hod SW82			
File ID: 11090707.D			Ва	tch ID: MS	15W09	07M		Date: 09/07/2011 11:02	
Sample ID: 11090105-01AMS	Units : µg/L			SD_15_110			Prep Date		
Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME) RPE	DRefVal %RPD(Limit)	Qua
Dichlorodifluoromethane	43.9	2.5	50	0		21	138		
Chloromethane Vinyl chloride	57.2	10	50	0		23	144		
Chloroethane	58.5 56.9	2.5 2.5	50 50	0		49 21	136 159		
Bromomethane	46	10	50	0		10	174		
Trichlorofluoromethane	65	2.5	50	Ö		32	154		
1,1-Dichloroethene	46.5	2.5	50	0	93	64	130		
Dichloromethane	44.9	10	50	0		69	130		
Freon-113 trans-1,2-Dichloroethene	52.6 47.3	2.5 2.5	50 50	0		55 63	141 130		
Methyl tert-butyl ether (MTBE)	47.3 45.9	1.3	50	0		4 <b>7</b>	150		
1,1-Dichloroethane	47.1	2.5	50	Ō		66	130		
2-Butanone (MEK)	852	50	1000	0		23	182		
cis-1,2-Dichloroethene	47.7	2.5	50	0		70	130		
Bromochloromethane Chloroform	49.1 49.1	2.5	50 50	0		70 70	132 130		
2,2-Dichloropropane	49.1 47.9	2.5 2.5	50 50	0		38	154		
1,2-Dichloroethane	49.6	2.5	50	0		65	134		
1,1,1-Trichloroethane	49.2	2.5	50	Ö		65	136		
1,1-Dichloropropene	50.6	2.5	50	0		68	132		
Carbon tetrachloride	49.3	2.5	50	0		58	148		
Benzene Dibromomethane	49.1 49.2	1.3	50	0		59 70	138 130		
1,2-Dichloropropane	49.2 46.8	2.5 2.5	50 50	0		70 70	131		
Trichloroethene	48.7	2.5	50	0		65	144		
Bromodichloromethane	49.1	2.5	50	Ō	_	50	157		
4-Methyl-2-pentanone (MIBK)	123	13	125	0		20	182		
cis-1,3-Dichloropropene	46.1	2.5	50	0		63	131		
trans-1,3-Dichloropropene 1,1,2-Trichloroethane	43.3 49.2	2.5	50 50	0		65 70	136		
Toluene	49.2 48	2.5 1.3	50 50	0		70 68	131 130		
1,3-Dichloropropane	45.7	2.5	50	0		70	130		
Dibromochloromethane	42.5	2.5	50	0	85	42	155		
1,2-Dibromoethane (EDB)	93.6	5	100	0		70	130		
Tetrachloroethene 1,1,1,2-Tetrachloroethane	48.5	2.5	50	0		65 70	130		
Chlorobenzene	48.8 47.4	2.5 2.5	50 50	0		70 70	130 130		
Ethylbenzene	51.5	1.3	50	0		68	130		
m,p-Xylene	50	1.3	50	Ŏ		68	131		
Bromoform	41.2	2.5	50	0	82	65	143		
Styrene o-Xylene	42.6	2.5	50	0		59	153		
1,1,2,2-Tetrachloroethane	50 43.7	1.3 2.5	50 50	0		70 67	130 130		
1,2,3-Trichloropropane	94.3	10	100	0		70	130		
Isopropylbenzene	46	2.5	50	ō		55	138		
Bromobenzene	47.5	2.5	50	0		70	130		
n-Propylbenzene	48.1	2.5	50	0		67	133		
4-Chlorotoluene 2-Chlorotoluene	45.8 45.6	2.5	50	0		70 70	130		
1,3,5-Trimethylbenzene	49.3	2.5 2.5	50 50	0		70 67	130 134		
tert-Butylbenzene	47.5	2.5	50	0		55	147		
1,2,4-Trimethylbenzene	49.1	2.5	50	0		65	135		
sec-Butylbenzene	47.2	2.5	50	0		68	135		
1,3-Dichlorobenzene 1,4-Dichlorobenzene	49.7	2.5	50	0		70 70	130		
4-Isopropyltoluene	45.6 - 49.5	2.5 2.5	50 50	0		70 68	130 132		
1,2-Dichlorobenzene	49.5 44.8	2.5	50 50	0		<b>7</b> 0	132		
n-Butylbenzene	51.3	2.5	50	0		62	134		
1,2-Dibromo-3-chloropropane (DBCP)	220	15	250	Ō	88	64	130		
1,2,4-Trichlorobenzene	45	10	50	0		62	133		
Naphthalene Hexachlorobutadiene	38.7	10	50	0		32	166		
1,2,3-Trichlorobenzene	106 45.5	10	100	0		63 55	130		
Surr: 1,2-Dichloroethane-d4	45.5 52.4	10	50 50	U	91 105	55 70	138 130		



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<b>Date:</b> 19-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11090622
Surr: 4-Bromofluorobenzene	44.9	50	90	70	130	



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Date: Work Order: QC Summary Report 19-Sep-11 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 PQL Result SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 51.4 2.5 103 138 43.89 15.7(33) Chloromethane 65 10 50 23 0 130 144 57.18 12.9(27) Vinvl chloride 68 2.5 50 136 49 136 58.49 15.1(21) Chloroethane 65.6 2.5 50 56.85 O 131 21 159 14.3(40) Bromomethane 54.6 10 50 109 10 174 46.03 17.1(40) n Trichlorofluoromethane 73.5 2.5 50 147 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 50 119 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 50 109 66 130 47.12 14.1(20) 2-Butanone (MEK) 1030 50 1000 n 103 23 182 851.7 19.1(22) cis-1,2-Dichloroethene 55.4 2.5 50 70 130 47.67 15.0(20) 0 111 Bromochloromethane 57.4 2.5 70 15.5(20) 50 115 132 49.1 Chloroform 56.7 2.5 70 50 0 49.06 14.4(20) 113 130 2.2-Dichloropropane 56.5 2.5 50 n 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 n 136 49.22 15.9(20) 50 115 65 1.1-Dichloropropene 58.3 2.5 50 117 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 49.18 16.9(20) 50 117 70 130 1,2-Dichloropropane 54 2.5 50 108 46.83 14.2(20) 0 70 131 Trichloroethene 55.3 2.5 50 0 111 65 144 48.7 12.7(20) Bromodichloromethane 57.4 2.5 50 157 49.11 15.5(20) 115 50 4-Methyl-2-pentanone (MIBK) 152 13 125 0 122 20 182 123 21.3(20) R5 cis-1,3-Dichloropropene 2.5 53.7 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 Λ 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 ٥ 108 70 130 45.68 16.7(20) Dibromochloromethane 50.1 2.5 16.4(20) 50 100 42 155 42.52 1,2-Dibromoethane (EDB) 110 5 100 0 110 70 130 93.57 16.1(20) Tetrachioroethene 56 2.5 0 50 112 65 130 48.5 14.3(20) 1,1,1,2-Tetrachloroethane 56 2.5 70 13.7(20) 50 112 130 48.84 Chlorobenzene 53.2 2.5 50 0 106 70 130 47.36 11.7(20) Ethylbenzene 58.3 1.3 50 n 117 68 130 51.5 12.3(20) m,p-Xylene 56.8 1.3 50 68 131 50.04 12.7(20) 114 **Bromoform** 50.8 2.5 50 0 102 65 R5 143 41.22 20.8(20) Styrene 48.7 2.5 50 0 97 59 153 42.62 13.4(37) o-Xylene 56.6 50 70 1.3 0 113 130 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 94.34 17.2(20) 130 Isopropylbenzene 50.8 2.5 0 102 55 45.97 10.0(20) 50 138 Bromobenzene 52.5 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 ٥ 106 55 147 475 10.9(20) 1,2,4-Trimethylbenzene 54.8 2.5 50 110 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 2.5 50 0 112 70 130 49.69 11.7(20) 1,4-Dichlorobenzene 51.3 2.5 50 0 103 70 45.63 130 11.8(20) 4-Isopropyltoluene 54.8 2.5 50 0 68 110 132 49.51 10.2(20) 1.2-Dichlorobenzene 2.5 50 0 102 70 44.79 13.4(20) 130 n-Butylbenzene 57.5 2.5 50 0 51.29 11.3(21) 115 134 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 0 50 101 32 38.71 26.8(40) 166 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



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<b>Date:</b> 19-Sep-11	QC	Summary Re	port		•	<b>Work Order:</b> 11090622
Surr: Toluene-d8	47.9	50	96	70	130	
Surr: 4-Bromofluorobenzene	44.5	50	89	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. R5 = MS/MSD RPD exceeded the laboratory control limit. Recovery met acceptance criteria.

# Billing Information:

# CHAIN-OF-CUSTODY RECORD

# Alpha Analytical, Inc

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TEL: (775) 355-1044 FAX: (775) 355-0406

Client:

San Diego, CA 92101

. Эор .

655 West Broadway Battelle Memorial Iristitute

Suite 1420

Report Attention Phone Number (614) 424-4899 (619) 726-7311 x connerd@battelle.org cutiee@batelle.org EMail Address

(614) 424-4117 x

waltons@battelle.org

Page: 1 of 1

WorkOrder: BMIS11090622

Report Due By: 5:00 PM On: 19-Sep-11

EDD Required: Yes

Sampled by: Chase Brogdon

Cooler Temp Samples Received 03-Sep-11 Date Printed 06-Sep-11

Sample ID QC Level: DS4 Client's COC #: 25564 BMI11090622-08A BMI11090622-07A BMI11090622-05A MW-20-1 BMI11090622-04A MW-20-2 BMI11090622-03A MW-20-3 BMI11090622-02A MW-20-4 BMI11090622-01A BMI11090622-06A EB-09-09/02/11 DUPE-04-3Q11 MW-20-5 TB-09-09/02/11 Sample ID Client = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates AQ 09/02/11 09:47 Š AQ 09/02/11 09:20 Š å Š g AQ 09/02/11 Matrix Date 09/02/11 09/02/11 09/02/11 00:00 09/02/11 10:12 09/02/11 07:00 100006114/JPL Groundwater Monitoring Collection No. of Bottles 08:46 Alpha S S G G S G G Sub 0 0 0 0 0 0 0 0 TAT 9 9 9 9 9 9 9 9 Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ Ü Ç Ω Ç Ç Ω VOC by 524 Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 Criteria VOC W Requested Tests Reno Trip Blark 7/19/11 Sample Remarks

Logged in by: 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).: Chunay **Print Name** Alpha Analytical, Inc. 9/6/11 1040 Date/Time

Comments:

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 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.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other)

Billing Information: Name <i>Bust BILE   GERBID TOM</i>	Alpha / 255 Glend	mples Collecte	Which State? 25564
Address SOS KING AUB City, State, Zip ColumBUS, OH 42	8	Sparks, Nevada 89431-5778  Phone (775) 355-1044	Page # of
Fax		2	quired /
Client Name / EMAIL CONNER	287215	Job# 10000011 (23) 27 80 21	Required QC Level?
Address Sect 90 & D + Drun ME C-20	SMail Address CONNERD @	24	
1680, CH 9%	Phone # (9) 726 - 73/1	6614	EDD / EDF? YES NO NO
Matrix' Sampled by 8,1	Avio conner	and type of STAL	Global ID #
Sampled Sampled Below Lab ID Number (Use Only)	Descri	Vi to:	REMARKS
0846 941, A Q BM111090622-01	MW -20-5	- VARIBOS XX	
920   02	+	S - VARCION X X	
<i>03</i>	mw - 20 - 3	5 · valeins X X X	
1012	mw - 20 - 2	Y - Vindicos X X	
1033 82/1 05	mw - 20 - 1	S- Viteins XXX	
	Dabe /- /11	S-vagas X X X	Doplizate
- 1/2/11 AQ 06	Pupe -04-3011	5/wey X X X	DUPLICATE
173 ohl. po	10 - 00 - 09/m	Z, 2, Y	}
1/1/ AQ	<del></del>	X	TILIPRIANK
ADDITIONAL INSTRUCTIONS:			
Signature	Print Name	Company	Date Time
Relinquished by	(19455 Busho)	ENSIGHT VEC.IN.	08/04/11 lavo
Received by	Intra stell	Alph August	2/11/
Relinquished by		,,,	5/2/11 1200
Received by Kluman	KMUMAN	AM	9/6/11 1020
Relinquished by			
Received by			

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.

\*Key: AQ - Aqueous

SO - Soil

WA - Waste

OT - Other

AR - Air

\*\*: L-Liter

V-Voa

S-Soil Jar

0-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



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

DIVITIO90/46	C	ooier 1 emp:
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**

		<del>Land D</del>
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

Kandy Soulner

Walter Acrilin



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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

### Perchlorate by Ion Chromatography EPA Method 314.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-26-2 Lab ID: BMI11090748-01A Date Sampled 09/06/11 09:17	Perchlorate	ND	1.00 µg/L	09/19/11 12:28	09/19/11 13:47
Client ID: <b>MW-26-1</b> Lab ID: BMI11090748-02A Date Sampled 09/06/11 09:36	Perchlorate	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: BMI11090748-03A Date Sampled 09/06/11 10:50	Perchlorate	ND	1.00 µg/L	09/19/11 12:28	09/19/11 15:56
Client ID: <b>MW-25-4</b> Lab ID: BMI11090748-04A Date Sampled 09/06/11 11:17	Perchlorate	7.61	1.00 μg/L	09/19/11 12:28	09/19/11 16:14
Client ID: MW-25-3 Lab ID: BMI11090748-05A Date Sampled 09/06/11 11:42	Perchlorate	9.08	1.00 μg/L	09/19/11 12:28	09/19/11 16:33
Client ID: MW-25-2 Lab ID: BMI11090748-06A Date Sampled 09/06/11 12:10	Perchlorate	13.3	1.00 μg/L	09/19/11 12:28	09/19/11 17:09
Client ID: MW-25-1 Lab ID: BM111090748-07A Date Sampled 09/06/11 12:31	Perchlorate	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: BMI11090748-08A Date Sampled 09/06/11 00:00	Perchlorate	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: BMI11090748-09A Date Sampled 09/06/11 09:45	Perchlorate	ND	1.00 μg/L	09/19/11 18:05	09/19/11 18:05



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ND = Not Detected

Roger Scholl Kandy

Walter Hirihum

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** 



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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: MW-26-2 Lab ID: BMI11090748-01A Date Sampled 09/06/11 09:17	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-26-1</b> Lab ID: BMI11090748-02A Date Sampled 09/06/11 09:36	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-5</b> Lab ID: BMI11090748-03A Date Sampled 09/06/11 10:50	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-4</b> Lab ID: BMI11090748-04A Date Sampled 09/06/11 11:17	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-3</b> Lab ID: BMI11090748-05A Date Sampled 09/06/11 11:42	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-2</b> Lab ID: BMI11090748-06A Date Sampled 09/06/11 12:10	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>MW-25-1</b> Lab ID: BMI11090748-07A Date Sampled 09/06/11 12:31	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>DUPE-05-3Q11</b> Lab ID: BMII1090748-08A Date Sampled 09/06/11 00:00	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11
Client ID: <b>EB-10-09/06/11</b> Lab ID: BM111090748-09A Date Sampled 09/06/11 09:45	Chromium (Cr)	ND	0.0050 mg/L	10/24/11	10/24/11



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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

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

Job:

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

100006114/JPL Groundwater Monitoring

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

	· · · · · · · · · · · · · · · · · · ·		Estimated		
	Parameter	Estimated	Reporting	Date	Date
		Concentration	Limit	Extracted	Analyzed
Client ID: MW-26-2  Lab ID: BMI11090748-01A  Date Received: 09/07/11  Date Sampled: 09/06/11 09:17	*** None Found ***	ND	2.0 μg/L	09/15/11 12:37	09/15/11 12:37
Client ID : MW-26-1  Lab ID : BMI11090748-02A  Date Received : 09/07/11  Date Sampled : 09/06/11 09:36	*** None Found ***	ND	2.0 μg/L	09/15/11 12:58	09/15/11 12:58
Client ID: MW-25-5 Lab ID: BMI11090748-03A Date Received: 09/07/11 Date Sampled: 09/06/11 10:50	Sulfur dioxide	14	2.0 μg/L	09/15/11 13:20	09/15/11 13:20
Client ID: MW-25-4  Lab ID: BMI11090748-04A  Date Received: 09/07/11  Date Sampled: 09/06/11 11:17	*** None Found ***	ND	2.0 μg/L	09/15/11 13:41	09/15/11 13:41
Client ID: MW-25-3  Lab ID: BMI11090748-05A  Date Received: 09/07/11  Date Sampled: 09/06/11 11:42	*** None Found ***	ND	2.0 μg/L	09/15/11 14:03	09/15/11 14:03
Client ID: MW-25-2 Lab ID: BMI11090748-06A Date Received: 09/07/11 Date Sampled: 09/06/11 12:10	*** None Found ***	ND	2.0 μg/L	09/15/11 14:24	09/15/11 14:24
Client ID: MW-25-1 Lab ID: BMI11090748-07A Date Received: 09/07/11 Date Sampled: 09/06/11 12:31	* * * None Found * * *	ND	2.0 μg/L	09/15/11 14:46	09/15/11 14:46
Client ID : <b>DUPE-05-3Q11</b> Lab ID : BMI11090748-08A  Date Received : 09/07/11  Date Sampled : 09/06/11 00:00	* * * None Found * * *	ND	2.0 μg/L	09/15/11 15:08	09/15/11 15:08
Client ID : EB-10-09/06/11 Lab ID : BMII 1090748-09A Date Received : 09/07/11 Date Sampled : 09/06/11 09:45	*** None Found ***	ND	2.0 μg/L	09/15/11 11:53	09/15/11 11:53



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Client ID:

TB-10-09/06/11

Lab ID:

BMI11090748-10A

\* \* \* None Found \* \* \*

ND

 $2.0~\mu\text{g/L}$ 

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

Kandy Saulner

Water Windows Overline Assurance Office

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



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### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-01A

Client I.D. Number: MW-26-2

David Conner Attn: Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Xvlene	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-Butvlbenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

34 1,2-Dibromoethane (EDB)

Roger Scholl

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA \bullet (916)\ 366-9089\ /\ Las\ Vegas, NV \bullet (702)\ 736-7522\ /\ Carson, CA \bullet (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

μg/L

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

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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

Alpha Analytical Number: BMI11090748-02A Client I.D. Number: MW-26-1

Attn: David Conner

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

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

Dichlorodifiluoromethane
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         0-Xylene         ND         0.50         μg/L           8         Dichloromethane         ND         0.50         μg/L         43         1,2,3-Trichloroptopane         ND         0.50         μg/L           10         trans-1,2-Dichloroethene         ND         0.50         μg/L         43         1,2,3-Trichloroptopane         ND         0.50         μg/L           11
Viryl chloride
Chloroethane
Second Exercises   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         Bromoehenzene         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         0.50         μg/L         48         4-Chlorotoluene         ND         0.50         μg/L           14 cis-1,2-Dichloroethane         ND         0.50         μg/L
7         1,1-Dichloroethene         ND         0.50         μg/L         42         c-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         0.50         μg/L         48         4-Chlorotoluene         ND         0.50         μg/L           14         cis-1,2-Dichloroethane         ND         0.50         μg/L         49         2-Chlorotoluene         ND         ND         0.50 </td
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
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
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
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
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 1,1-Dichloropropene
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
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17         2,2-Dichloropropane         ND $0.50$ $\mu$ g/L         52         1,2,4-Trimethylbenzene         ND $0.50$ $\mu$ g/L           18         1,2-Dichloroethane         ND $0.50$ $\mu$ g/L         53         sec-Butylbenzene         ND $0.50$ $\mu$ g/L           19         1,1,1-Trichloroethane         ND $0.50$ $\mu$ g/L         54         1,3-Dichlorobenzene         ND $0.50$ $\mu$ g/L           20         1,1-Dichloropropene         ND $0.50$ $\mu$ g/L         55         1,4-Dichlorobenzene         ND $0.50$ $\mu$ g/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
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
20 1,1-Dichloropropene ND 0.50 μg/L 55 1,4-Dichlorobenzene ND 0.50 μg/L
04 O-4- (1 11 11
21 Carbon tetrachloride ND 0.50 μg/L 56 4-Isopropyttoluene 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-Buty/benzene 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-Trichloroberizene ND 1.0 μg/L
26 Bromodichloromethane ND 0.50 µg/L 61 Naphthalene ND 1.0 µg/L
27 4-Methyl-2-peritanorie (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-Trichloropenzene 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

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

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



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### **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-03A

Client I.D. Number: MW-25-5

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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-Butvlbenzene	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-Butvlbenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBC	1	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		Tana a samula a samul	, 55	(, 5 , 60)	,,,,,
33	Dibromochloromethane	ND	0.50	μg/L					
24	1.2 Dibromoothers (EDD)								

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Saulur

ND

Walter Hirihum

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

μg/L

1.0

0.50

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** 



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### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-04A

Client I.D. Number: MW-25-4

Attn: **David Conner** Phone: (619) 726-7311

Fax: (614) 458-6641

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	, ,
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	, .
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	1.0
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	F-0-
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xvlene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	
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	
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 ND	0.50	μg/L
13	2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND 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-Isopropyttoluene	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 (DBCF	-	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
	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			1	(10.00)	
33	Dibromochloromethane	ND	0.50	μg/L					
24	1,2-Dibromoethane (EDB)	ND		. •					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer  $Sacramento, CA \bullet (916)\ 366-9089\ /\ Las\ Vegas,\ NV \bullet (702)\ 736-7522\ /\ Carson,\ CA \bullet (714)\ 386-2901\ /\ info@alpha-analytical.com$ 

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.

**Report Date** 



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### **ANALYTICAL REPORT**

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-05A

Client I.D. Number: MW-25-3

Attn: David Conner

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

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	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	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	
4	Chloroethane	ND	0.50	µg/L	39	m,p-Xylene	ND	0.50	
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xvlene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1.1.2.2-Tetrachloroethane	ND	0.50	
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	
11	Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.50	
12	1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.50	
13	2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND	0.50	
14	cis-1,2-Dichloroethene	ND	0.50	μg/L	49	2-Chlorotoluene	ND	0.50	
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-Butvlbenzene	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-Isopropyttoluene	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 (DBC)	P) 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			1 33	(.5 /65)	, 0
33	Dibromochloromethane	ND	0.50	ua/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kundge Saulman

ND

Walter Hindren

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

μg/L

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** 



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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: BMI11090748-06A 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		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 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 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-Propvibenzene	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 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 (DBC)		2.5	μg/L μg/L
25	Trichloroethene	ND	0.50	μg/L	60	1,2,4-Trichlorobenzene	ND	1.0	μg/L μg/L
26	Bromodichloromethane	ND	0.50	µg/L	61	Naphthalene	ND ND	1.0	μg/L
27	4-Methyl-2-pentanone (MIBK)	ND	2.5	µg/L	62	Hexachlorobutadiene	ND	1.0	
28	cis-1,3-Dichloropropene	ND	0.50	μg/L	63	1,2,3-Trichlorobenzene	ND	1.0	μg/L 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	00	Cuit. 4-Diomonobenzene	1 09	(70-130)	MEG
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	ug/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

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

μg/L

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.

**Report Date** 



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#### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-07A

Client I.D. Number: MW-25-1

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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 (DBCI		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			, 55	(.0.700)	,0,120
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

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

μg/L

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.

**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job: 100006114/IPL G

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-08A

Client I.D. Number: DUPE-05-3Q11

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Butvlberizene	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-Butvlbenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBC)	P) 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-Trichioroethane	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			1	, ,	
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Tetrachloroethene

Roger Scholl Kandy Salur

Walter Sterning

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

μg/L

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9/21/11

**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Joh: 100006114

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-09A

Client I.D. Number: EB-10-09/06/11

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Xvlene	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 (DBC)		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	••			(.0.00)	,
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					
25	Totasablasasthasa			- <del></del>					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl Kandy Soulmer

Walter Hirihan

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

μg/L

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** 



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090748-10A

Client I.D. Number: TB-10-09/06/11

David Conner Phone: (619) 726-7311

(614) 458-6641

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 L	imit
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-Butvibenzene	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-Butvlbenzene	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 (DBC	P) 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			ŧ	, ,	
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

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

μg/L

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

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**Report Date** 



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# **VOC Sample Preservation Report**

Work Order: BMI11090748 Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	рН
I1090748-01A	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



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<b>Date:</b> 22-Sep-11	QC Summary Report								<b>Work Order:</b> 11090748		
Method Blar File ID: 16 Sample ID: Analyte Perchlorate	MB-27340	Units : <b>µg/L</b> Result ND	Type: I		Test Code: I Batch ID: <b>27</b> IC_3_110919 al SpkRefVa	340 9A		Prep Date	: (	09/19/2011 12:52 09/19/2011 12:28 al %RPD(Limit)	Qual
	Fortified Blank		Type: I	LFB	Test Code: I	EPA Me	thod 314.0				
File ID: 17 Sample ID: Analyte	LFB-27340	Units : <b>µg/L</b> Result	PQL		Batch ID: <b>27</b> IC_3_110919 al SpkRefVa	A	C LCL(ME)	Prep Date	: (	09/19/2011 13:10 09/19/2011 12:28 al %RPD(Limit)	Qual
Perchlorate		25.8			25	103	85	115			
Sample Mat File ID: 20 Sample ID: Analyte	rix Spike 11090748-01ALFM	Units : <b>µg/L</b> Result	Type: I	Run ID:	Test Code: I Batch ID: 27 IC_3_110919 al SpkRefVa	340 )A		Prep Date	: (	09/19/2011 14:05 09/19/2011 12:28 al %RPD(Limit)	Qual
Perchlorate		23.7				95	80	120			
Sample Mat File ID: 21	rix Spike Duplicate		Type: I		Test Code: I Batch ID: 27		thod 314.0	Analysis D	ate: (	09/19/2011 14:24	
Sample ID: Analyte	11090748-01ALFMD	Units : <b>µg/L</b> Result	PQL		I <b>C_3_11091</b> 9 al SpkRefVa		C LCL(ME)	Prep Date UCL(ME) RPI		09/19/2011 12:28 al %RPD(Limit)	Qual
Perchlorate		25.1	:	2 2	25	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.



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<b>Date:</b> 25-Oct-11	QC Summary Report	<b>Work Order:</b> 11090748
Method Blank File ID: 102411.B\016_M.D\ Sample ID: MB-27531 Analyte	Type MBLK Test Code: EPA Method 200.8  Batch ID: 27531 Analysis Dat  Units: mg/L Run ID: ICP/MS_111024A Prep Date:  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDR	te: 10/24/2011 15:04 10/24/2011 14:30 efVal %RPD(Limit) Qual
Chromium (Cr)	ND 0.005	
Laboratory Control Spike File ID: 102411.B\017_M.D\ Sample ID: LCS-27531	Units: mg/L Run ID: ICP/MS_111024A Prep Date:	te: 10/24/2011 15:10 10/24/2011 14:30
Analyte Chromium (Cr)	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDR  0.0479	efVal %RPD(Limit) Qual
Sample Matrix Spike File ID: 102411.B\022_M.D\ Sample ID: 11090748-01AMS Analyte	Type MS Test Code: EPA Method 200.8	e: <b>10/24/2011 15:39</b> <b>10/24/2011 14:30</b> efVal %RPD(Limit) Qual
Chromium (Cr)	0.0501 0.005 0.05 0 100 70 130	<del></del>
Sample Matrix Spike Duplicate File ID: 102411.B\023_M.D\ Sample ID: 11090748-01AMSD Analyte	Type MSD Test Code: EPA Method 200.8  Batch ID: 27531 Analysis Dat  Units : mg/L Run ID: ICP/MS_111024A Prep Date:  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDR	e: 10/24/2011 15:45 10/24/2011 14:30 efVal %RPD(Limit) Qual
Chromium (Cr)		5012 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.



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<b>Date:</b> 21-Sep-11	(	QC Sumr	nary Report			<b>Work Ordo</b> 11090748	
Method Blank	* * * * * * * * * * * * * * * * * * * *	Type MBLK	60B				
File ID: 11091506.D			Batch ID: MS15	W0915M	Analysis Dat	e: <b>09/15/2011 10:49</b>	
Sample ID: MBLK MS15W0915M	Units : µg/L	Run	D: MSD_15_11091	5B	Prep Date:	09/15/2011 10:49	
Analyte	Result	PQL Sp	kVal SpkRefVal %	REC LCL(ME)	UCL(ME) RPDR	efVal %RPD(Limit)	Qual
Dichlorodifluoromethane	ND	0.5					<del></del>
Chloromethane	ND	1					
Vinyl chloride	ND	0.5					
Chloroethane	ND	0.5					
Bromomethane Trichlorofluoromethane	ND	1 2 5					
1,1-Dichloroethene	ND ND	0.5 0.5					
Dichloromethane	ND	0.5 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 Bromochloromethane	ND ND	0.5					
Chloroform	ND ND	0.5 0.5					
2,2-Dichloropropane	ND ND	0.5 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 Dibromomethane	ND	0.5					
1,2-Dichloropropane	ND ND	0.5					
Trichloroethene	ND ND	0.5 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 1,3-Dichloropropane	ND ND	0.5					
Dibromochloromethane	ND ND	0.5 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 Bromoform	ND ND	0.5					
Styrene	ND ND	0.5 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 4-Chlorotoluene	ND ND	0.5					
2-Chlorotoluene	ND ND	0.5 0.5					
1,3,5-Trimethylbenzene	ND 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 4-Isopropyltoluene	ND ND	0.5					
1,2-Dichlorobenzene	ND ND	0.5 0.5					
n-Butylbenzene	ND ND	0.5 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 10.5	1					
Surr: 1,2-Dichloroethane-d4 Surr: Toluene-d8	10.5			05 70	130		
Jam Foldorio do	9.85		10	99 70	130		



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<b>Date:</b> 21-Sep-11	QC	Summary Re	port			<b>Work Order:</b> 11090748
Surr: 4-Bromofluorobenzene	8.95	10	90	70	130	



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<b>Date:</b> 21-Sep-11	QC Summary Report								<b>Work Order:</b> 11090748	
File ID: 11091			Type L		est Code: EPA Me Batch ID: MS15W09			: 09/15/2011 09:44		
Sample ID:	LCS MS15W0915M	Units : µg/L		Run ID: N	ISD_15_110915B		Prep Date:	09/15/2011 09:44		
Analyte		Result	PQL	SpkVal	SpkRefVal %RE0	C LCL(ME)	UCL(ME) RPDRe	fVal %RPD(Limit)	Qual	
Dichlorodifluor	omethane	7.36	1	10	74	70	130			
Chloromethan	е	11.5	2			70	130			
Vinyl chloride		9.53	1			70	130			
Chloroethane		11.1	1			70	130			
Bromomethane Trichlorofluoro		8.35	2			70 70	130			
1.1-Dichloroeth		11.5 10	1			70 70	130 130			
Dichlorometha		10.1	2			70 70	130			
Freon-113		11,4	1			70	137			
trans-1,2-Dichl		10.4	1			70	130			
	yl ether (MTBE)	11.7	0.5	5 10	117	70	130			
1,1-Dichloroeth		10.5	1	10	105	70	130			
2-Butanone (M	•	301	10	200	150	70	130(130)		L51	
cis-1,2-Dichlor		10.6	1			70	130			
Bromochlorom	ethane	11.3	1			70	130			
Chloroform	0000	11	1			70	130			
2,2-Dichloropro	-	11	1			70 70	130			
1,1,1-Trichloro		11.8 10.9	1			70 70	130			
1,1-Dichloropro		11.3	1			70 70	130 130			
Carbon tetrach		10.1	1			70	130			
Benzene		10.8	0.5			70	130			
Dibromometha	ne	11.4	1			70	130			
1,2-Dichloropro		10.6	1	10	106	70	130			
Trichloroethen	=	10.9	1	10	109	70	130			
Bromodichloro		9.99	1			70	130			
	ntanone (MIBK)	32.9	2.5			20	182			
cis-1,3-Dichlore trans-1,3-Dichl		10.6	1			70	130			
1,1,2-Trichloro		9.93 11.4	1			70 70	130 130			
Toluene	culano	10.6	0.5			70 70	130			
1,3-Dichloropro	opane	10.8	1			70	130			
Dibromochloro		8.11	1			70	130			
1,2-Dibromoeth		21.9	2			70	130			
Tetrachloroeth		10.7	1	10	107	70	130			
1,1,1,2-Tetrach		10.3	1	. •		70	130			
Chlorobenzene	•	10.4	1	. •		70	130	•		
Ethylbenzene m,p-Xylene		11.1	0.5			70	130			
Bromoform		11 7.57	0.5			70 70	130			
Styrene		7.57 9.59	1			70 70	130 130			
o-Xylene		11	0.5			70	130			
1,1,2,2-Tetrach	nloroethane	10.4	1			70	130			
1,2,3-Trichloro	- •	23.1	2			70	130			
Isopropylbenze		9.75	1	10	98	70	130			
Bromobenzene		10.3	1			70	130			
n-Propylbenzei		10.1	1	10		70	130			
4-Chlorotoluene		9.97	1	10		70 70	130			
1,3,5-Trimethyl	_	9.73	1	10		70 70	130			
tert-Butylbenze		10.3 9.91	1	10 10		70 70	130 130			
1,2,4-Trimethyl		10.4	1			70 70	130			
sec-Butylbenze		9.81	i			70	130			
1,3-Dichlorober		10.8	1			70	130			
1,4-Dichlorober		10	1			70	130			
4-Isopropyltolu		10.2	1	10	102	70	130			
1,2-Dichlorober		10	1			70	130			
n-Butylbenzene		10.6	1			70	130			
1,2-Dibromo-3- 1,2,4-Trichlorol	-chloropropane (DBCP)	49 10 5	3			67 70	130			
Naphthalene	CONTRIC	10.5 10.2	2			70 70	130			
Hexachlorobuta	adiene	19.9	2 2			70 70	130 130			
1,2,3-Trichlorol		11	2		110	70 70	130			
Surr: 1,2-Dichlo		11.2	2	10	112	70 70	130			
Surr: Toluene-c		9.62		10		70 70	130			



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Date: _21-Sep-11	QC	Summary Re	port			Work Order: 11090748
Surr: 4-Bromofluorobenzene	93	10	03	70	130	



Surr: Toluene-d8

## Alpha Analytical, Inc.

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Date: Work Order: QC Summary Report 21-Sep-11 Sample Matrix Spike Type MS Test Code: EPA Method SW8260B File ID: 11091528.D Batch ID: MS15W0915M Analysis Date: 09/15/2011 18:43 Sample ID: 11090748-01AMS Units: µg/L Prep Date: 09/15/2011 18:43 Run ID: MSD\_15\_110915B Analyte PQL Result SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 42.8 2.5 Chloromethane 53.6 Vinvl chloride 53.9 2.5 Chloroethane 47.1 2.5 **Bromomethane** 34.8 Trichlorofluoromethane 49.9 2.5 99.7 1,1-Dichloroethene 43.5 2.5 Dichloromethane 45.4 Freon-113 50.7 2.5 trans-1,2-Dichloroethene 46.1 2.5 Methyl tert-butyl ether (MTBE) 53.4 1.3 1 1-Dichloroethane 46.5 2.5 2-Butanone (MEK) cis-1,2-Dichloroethene 46.4 2.5 Bromochloromethane 2.5 Chloroform 48.3 2.5 2,2-Dichloropropane 40.3 2.5 1,2-Dichloroethane 52.9 2.5 1,1,1-Trichloroethane 47.6 2.5 1,1-Dichloropropene 49.6 2.5 Carbon tetrachloride 2.5 43.2 Benzene 47.4 1.3 Dibromomethane 51.8 2.5 1,2-Dichloropropane 46.3 2.5 Trichloroethene 46.4 2.5 Bromodichloromethane 45.1 2.5 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene 42.6 2.5 trans-1,3-Dichloropropene 42.3 2.5 1,1,2-Trichloroethane 51.9 2.5 Toluene 44.6 1.3 1,3-Dichloropropane 2.5 Dibromochloromethane 37.1 2.5 1,2-Dibromoethane (EDB) 96.1 Tetrachloroethene 44.7 2.5 1,1,1,2-Tetrachloroethane 44.7 2.5 Chlorobenzene 45.4 2.5 Ethylbenzene 48.2 1.3 m,p-Xylene 47.2 1.3 **Bromoform** 35.2 2.5 Styrene 40.9 2.5 o-Xylene 47.7 1.3 1,1,2,2-Tetrachloroethane 47.8 2.5 1,2,3-Trichloropropane Isopropylbenzene 41.7 2.5 Bromobenzene 44.6 2.5 n-Propylbenzene 2.5 4-Chlorotoluene 2.5 2-Chlorotoluene 2.5 1,3,5-Trimethylbenzene 44.7 2.5 tert-Butylbenzene 43.1 2.5 1,2,4-Trimethylbenzene 44.5 2.5 sec-Butylbenzene 42.6 2.5 1,3-Dichlorobenzene 2.5 45.6 1.4-Dichlorobenzene 42.5 2.5 4-Isopropyltoluene 44.1 2.5 1,2-Dichlorobenzene 42.8 2.5 n-Butylbenzene 44.5 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1,2,4-Trichlorobenzene 41.8 n Nachthalene 44.4 Hexachlorobutadiene 85.3 1,2,3-Trichlorobenzene 45.8 Surr: 1,2-Dichloroethane-d4 57.2 

46.7



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<b>Date:</b> 21-Sep-11		Q	C Summary Rep	ort			<b>Work Order:</b> 11090748
Surr: 4-Bromofluorobenzene	:	45.4	50	91	70	130	



Surr: Toluene-d8

## Alpha Analytical, Inc.

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

Date: Work Order: **QC** Summary Report 21-Sep-11 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 Prep Date: Run ID: MSD\_15\_110915B 09/15/2011 19:05 Analyte PQL Result SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 44.9 2.5 90 138 50 0 21 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 0 49 53.92 50 112 136 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 0 116 32 49.86 50 154 15.5(37) 1.1-Dichloroethene 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 2.5 52 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 0 66 50 95 130 46.54 2.5(20)2-Butanone (MEK) 1000 1.9(22) 50 1000 0 100 23 182 981.9 cis-1,2-Dichloroethene 47.5 2.5 50 0 95 70 130 46.43 2.3(20)Bromochloromethane 2.5 52.2 0 104 70 50.04 50 132 4.2(20)Chloroform 50 2.5 0 100 70 130 48.3 3.5(20) 50 2,2-Dichloropropane 42.2 2.5 50 0 84 38 154 40.26 4.7(22)1,2-Dichloroethane 54.3 0 2.5 50 109 65 134 52.87 2.7(20)1.1.1-Trichloroethane 49.6 0 50 99 65 136 47.59 4.2(20)1,1-Dichloropropene 50.7 2.5 0 50 101 68 132 49.59 2.1(20)Carbon tetrachloride 47.2 2.5 0 94 58 43.15 50 148 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 0 50 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 0 50 89 65 42.25 136 4.7(20)1,1,2-Trichloroethane 53.1 2.5 50 0 106 70 131 51.9 2.3(20)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 0 42 37.05 50 80 155 8.1(20) 1,2-Dibromoethane (EDB) 101 70 4.6(20) 5 100 0 101 130 96.08 Tetrachloroethene 2.5 46.2 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 2.5 46.7 0 93 70 130 45.35 50 2.9(20)Ethylbenzene 49.7 0 1.3 50 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 35.22 143 9.3(20)Styrene 42 2.5 50 0 84 59 153 40.88 2.6(37)o-Xylene 49 70 1.3 50 0 98 130 47.7 2.7(20)1,1,2,2-Tetrachloroethane 49,4 2.5 50 0 99 67 47.75 130 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-Propvlbenzene 44.6 2.5 0 89 50 67 133 43.03 3.5(30)4-Chlorotoluene 43.5 2.5 50 70 0 87 130 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 92 0 65 135 44.47 3.5(25)sec-Butylbenzene 44 2.5 50 68 0 88 135 42.6 3.2(20)1,3-Dichlorobenzene 47.4 2.5 50 0 95 70 45.56 130 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 68 132 44.09 91 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 64 15 250 96 223.8 0 130 7.3(20)1,2,4-Trichlorobenzene 45 10 50 0 90 62 41.8 7.3(29)133 Naphthalene 46.3 10 50 93 32 166 44.35 4.2(40)Hexachlorobutadiene 90.7 10 100 n 91 63 130 85.28 6.2(21) 1.2.3-Trichlorobenzene 49.2 55 50 98 138 45.83 7.0(36)Surr: 1,2-Dichloroethane-d4 56.9 50 114 70 130

50

94

70

130

47.2



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

<b>Date:</b> 21-Sep-11	QC	QC Summary Report				<b>Work Order:</b> 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

# Alpha Analytical, Inc.

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

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

PO: 287215

San Diego, CA 92101

Suite 1420

**Battelle Memorial Institute** 655 West Broadway

Client's COC #: none

Job :

100006114/JPL Groundwater Monitoring

Page: 10f1

WorkOrder: BMIS11090748

Report Due By: 5:00 PM On: 21-Sep-11

Amendment due: ASAP

EDD Required: No

Sampled by : Chase Brogdon

Cooler Temp Samples Received 07-Sep-11 Date Printed 21-Oct-11

Sample ID BMI11090748-10A BMI11090748-09A BMI11090748-07A BMI11090748-06A MW-25-2 BMI11090748-08A DUPE-05-3Q11 BMI11090748-05A MW-25-3 BMI11090748-04A MW-25-4 BMI11090748-03A MW-25-5 BMI11090748-02A MW-26-1 BMI11090748-01A MW-26-2 QC Level: DS4 EB-10-09/06/11 MW-25-1 TB-10-09/06/11 Client Sample ID DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates å å å å å Matrix Date å Š å Š Š 09/06/11 09:17 09/06/11 07:30 09/06/11 09:45 09/06/11 00:00 09/06/11 12:31 09/06/11 12:10 09/06/11 09:36 09/06/11 11:17 Collection No. of Bottles 09/06/11 11:42 09/06/11 10:50 Alpha Sub G Ġ G G G G G Ġ 0 0 0 0 0 0 0 0 0 0 TAT 6 70 6 6 5 6 6 6 6 6 Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ VOC\_W Ç Ç Ω Ç Ç Ü VOC by 524 VOC by 524 Criteria Criteria Requested Tests RENO TRIP BLANK 6/7/11 Sample Remarks

Comments:

change Metals AQ to Metals DW due to login error. Due ASAP. CG: 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

Company Date/Time Alpha Analytical, Inc. 10 21 11 13:33

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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 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

Phone Number (619)726-7311 x

connerd@battelle.org

EMail Address

San Diego, CA 92101 655 West Broadway Battelle Memorial Institute Report Attention Shane Walton David Conner Betsy Cutie

Suite 1420

287215

. go

100006114/JPL Groundwater Monitoring

(614) 424-4117 x (614) 424-4899

waltons@battelle.org cutiee@batelle.org

QC Level: DS4 Client's COC #: none

Page: 1 of 1

WorkOrder: BMIS11090748

Report Due By: 5:00 PM On: 21-Sep-11

EDD Required: Yes

Sampled by : Chase Brogdon

Cooler Temp Samples Received 07-Sep-11 Date Printed 07-Sep-11

BMI11090748-10A BMI11090748-09A EB-10-09/06/11 BMI11090748-08A DUPE-05-3Q11 BMI11090748-07A BMI11090748-06A BMI11090748-05A BMI11090748-04A MW-25-4 Sample ID BMI11090748-03A MW-25-5 BMI11090748-02A MW-26-1 BMI11090748-01A MW-25-2 MW-25-3 MW-26-2 TB-10-09/06/11 MW-25-1 Sample ID Client = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates AQ 09/06/11 11:42 Ą AQ 09/06/11 07:30 Ą å å à ð Matrix Date å AQ 09/06/11 09:17 09/06/11 00:00 09/06/11 09:45 09/06/11 11:17 09/06/11 12:31 09/06/11 12:10 09/06/11 10:50 09/06/11 09:36 Collection No. of Bottles Alpha G Ö G S Ö S S S G Sub 0 0 0 0 0 0 0 0 0 0 ΤAΤ 5 6 5 6 6 5 5 6 6 6 Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_A VOC\_TIC\_ <u>م</u> Ç ζ, Ç Ç Ç ڻ د Ç VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria VOC by 524 | VOC by 524 Criteria | Criteria VOC by 524 VOC by 524 Criteria Criteria Criteria Requested Tests VOC\_W **RENO TRIP BLANK 6/7/11** Sample Remarks

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:	
	Mille	Signature
	Chery I Gamble	Print Name
The second secon	Alpha Analytical, Inc. 9/-	
	1/11 13:55	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

		Alpha Analytical, Inc.	nples Collected From W	h State?
NO AVE	JANAKINS		ID OR OTHER	Page #   of
Columbus, OH 4	13201	Phone (775) 355-1044 Fax (775) 355-0406		
riole Nullber rax		H11400001	Allalyses Lequilea	
CHENT NAME / PAUD CONNER	PO.# 287215	7	2) 0.8) 1.0)	Required QC Level?
3990 OID TOWN AVE- C-205	1	IC OPG	(20) (20)	/ / II (III) IV
City, State, Ap Diego, CA 92110	) Phone # (6(9) 726-7311	Fax#614) 458-6614	CR	EDD / EDF? YESNO
Time Date Matrix* Sampled by F Brown	Report Attention	Total and type of	DC STAL	Global ID #
	Sample Description	TAT Field "See below	tot PER	REMARKS
017/8// AU BMI11090748-014	14 2mm - 26 - 2	3	<u> </u>	
_1	1 W 1	N	XXX	
150 1/4/11 PQ -03A	3A MW-28-5	32 20 X	XXX	
117 1 Ota	A MW-25-4		XXX	
0-	05A MW-25-3	×	^ X X	
-0.	06A MW-25-2	<b>*</b>	XX	
1231 1/6/1/ AQ	074 MW-25-1	3, 2, >	X	
-08A	A Dupi-05 -30	1/ 3, 2,	X	Du OLIV MU
-Co	CAN EB-10-08/06/11	3, 20	×	Ean, Phen Blad
20 Jah 100 -10	10A TB-10-09/06/11			mrp Beaule
ADDITIONAL INSTRUCTIONS:				
Signature	Print Name	:	Company	Date Time
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Received by All Marian Relinquished by	Chery (Gamb)	Alpha	9	1/7/11 13:39
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	WA - Waste OT - Other AR - Air results are reported unless other arrangements	**: L-Liter V-Voa S-Soil Jar ents are made. Hazardous samples will be retu	O-Orbo T-Tedlar B-Brass rned to client or disposed of at client ex	P-Plastic OT-Other cpense. The report for the analysis
of the above complete is applicable only to those complete	amples received by the laboratory with this con	this ope The liability of the laboratory is limited to the	d to the emplint poid for the report	

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.



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

Order: BMIT1090825	Cooler 1 emp:			
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

KandgSaulner

Walter Firehour



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: 09/08/11

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

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: 09/08/11

Job:

100006114/JPL Groundwater Monitoring

#### Perchlorate by Ion Chromatography EPA Method 314.0

		Est 21 Mediod 514.0			
	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-12-5 Lab ID: BM111090825-01A Date Sampled 09/07/11 09:10	Perchlorate	1.61	1.00 µg/L	09/12/11 15:22	09/12/11 19:22
Client ID: MW-12-4 Lab ID: BMI11090825-02A Date Sampled 09/07/11 09:28	Perchlorate	3.49	1.00 μg/L	09/12/11 15:22	09/12/11 19:40
Client ID: MW-12-3 Lab ID: BM111090825-03A Date Sampled 09/07/11 09:51	Perchlorate	4.29	1.00 μg/L	09/12/11 15:22	09/12/11 19:59
Client ID: MW-12-2 Lab ID: BM111090825-04A Date Sampled 09/07/11 10:11	Perchlorate	6.10	1.00 μg/L	09/12/11 15:22	09/12/11 20:54
Client ID: MW-12-1 Lab ID: BMI11090825-05A Date Sampled 09/07/11 10:42	Perchlorate	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: BMII 1090825-06A Date Sampled 09/07/11 10:29	Perchlorate	ND	1.00 μg/L	09/12/11 15:22	09/12/11 22:08
Client ID: MW-11-4 Lab ID: BMI11090825-08A Date Sampled 09/07/11 11:51	Perchlorate	ND	1.00 μg/L	09/12/11 15:22	09/12/11 22:26
Client ID: MW-11-3 Lab ID: BMI11090825-09A Date Sampled 09/07/11 12:16	Perchlorate	ND	1.00 μg/L	09/12/11 15:22	09/19/11 12:33
Client ID: MW-11-2 Lab ID: BMI11090825-10A Date Sampled 09/07/11 12:38	Perchlorate	ND	1.00 µg/L	09/12/11 15:22	09/12/11 23:03
Client ID: MW-11-1 Lab ID: BMII1090825-11A Date Sampled 09/07/11 13:16	Perchlorate	ND	1.00 µg/L	09/12/11 15:22	09/12/11 23:21
Client ID: <b>DUPE-06-3Q11</b> Lab ID: BMI11090825-12A Date Sampled 09/07/11 00:00	Perchlorate	ND	1.00 µg/L	. 09/12/11 15:22	09/12/11 23:40



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

Kandy Saulner

Walter Strikm

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** 



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

D-4 - 1

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: MW-12-3 Lab ID: BM111090825-03A Date Sampled 09/07/11 09:51	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:02
Client ID: MW-12-2 Lab ID: BM111090825-04A Date Sampled 09/07/11 10:11	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:08
Client ID: MW-12-1 Lab ID: BMI11090825-05A Date Sampled 09/07/11 10:42	Chromium (Cr)	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: BMI11090825-06A Date Sampled 09/07/11 10:29	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:14
Client ID: MW-11-3 Lab ID: BMI11090825-09A Date Sampled 09/07/11 12:16	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 05:21
Client ID: <b>MW-11-2</b> Lab ID: BMI11090825-10A Date Sampled 09/07/11 12:38	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:31
Client ID: MW-11-1 Lab ID: BMI11090825-11A Date Sampled 09/07/11 13:16	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:37
Client ID: <b>DUPE-06-3Q11</b> Lab ID: BMI11090825-12A Date Sampled 09/07/11 00:00	Chromium (Cr)	ND	0.0050 mg/L	09/09/11 11:02	09/12/11 15:42

ND = Not Detected

Roger Scholl Kandy Saulun

Walter Hirihan

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.

9/20/11

Report Date



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:

Phone: (619) 726-7311 Fax:

(614) 458-6641

Attn: David Conner

100006114/JPL Groundwater Monitoring

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

			Estimated		
	Parameter	Estimated Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: MW-12-5 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: MW-12-4  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: MW-12-3  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: MW-12-2  ab 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: MW-12-1  ab ID: BMII 1090825-05A  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: EB-11-09/07/11 ab ID: BMII 1090825-06A 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: TB-11-09/07/11 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: MW-11-4 ab 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
lient ID: MW-11-3 ab ID: BMI11090825-09A late Received: 09/08/11 late 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: MW-11-2 Lab ID: BMI11090825-10A Date Received: 09/08/11 Date Sampled: 09/07/11 12:38	Sulfur dioxide	3.0	2.0 μg/L	09/16/11 15:12 09/16/11 15:12
Client ID: MW-11-1 Lab ID: BMI11090825-11A Date Received: 09/08/11 Date Sampled: 09/07/11 13:16	Sulfur dioxide	2.5	2.0 μg/L	09/16/11 15:33 09/16/11 15:33
Client ID : <b>DUPE-06-3Q11</b> Lab ID : BMII 1090825-12A Date Received : 09/08/11	Sulfur dioxide	2.2	2.0 μg/L	09/16/11 15:55 09/16/11 15:55

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Date Sampled: 09/07/11 00:00

Roger Scholl

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.

**Report Date** 

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#### ANALYTICAL REPORT

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-01A

Client I.D. Number: MW-12-5

**David Conner** Attn: Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Xvlene	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-Butvibenzene	ND	0.50	μg/L
24	1,2-Dichloropropane	ND	0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBC)	P) 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			1	( - 700)	
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

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

μg/L

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Report Date



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#### ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-02A

Client I.D. Number: MW-12-4

David Conner Attn:

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

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	Bromochioromethane	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 (DBC)	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

ND

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1.0

μg/L

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

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**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job 100006114/

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-03A

Client I.D. Number: MW-12-3

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 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 (DBC	P) 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	μ <b>g</b> /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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Saulur

ND

Walter Hindren

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

μg/L

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9/21/11 Report Date



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#### ANALYTICAL REPORT

**Battelle Memorial Institute** 

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-04A

Client I.D. Number: MW-12-2

Attn: **David Conner** 

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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	Bromochioromethane	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 (DBCI	P) 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					
- 4	4.0 D'1 (EDD)	1		-					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

ND

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

1.0

μg/L

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.

**Report Date** 



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

100006114/JPL Groundwater Monitoring

David Conner (619) 726-7311 Phone:

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	0.5	0 μg/L
2	Chloromethane	ND	1.0	μg/L	37	Chlorobenzene	ND	0.5	
3	Vinyl chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.5	
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.5	0 μg/L
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	J 0.5	0 μg/L
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.5	0 μg/L
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xylene	ND	0.5	0 μg/L
8	Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.5	
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	0.5	0 μg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	μg/L	46	Bromobenzene	ND	0.5	
12	1,1-Dichloroethane	ND	0.50	μg/L	47	n-Propylbenzene	ND	0.5	
13	2-Butanone (MEK)	ND	10	μg/L	48	4-Chlorotoluene	ND	0.5	
14	cis-1,2-Dichloroethene	ND	0.50	μg/L	49	2-Chlorotoluene	ND	0.5	
15	Bromochloromethane	ND	0.50	μg/L	50	1,3,5-Trimethylbenzene	ND	0.5	
16	Chloroform	ND	0.50	μg/L	51	tert-Butylbenzene	ND	0.5	0 μg/L
17	2,2-Dichloropropane	ND	0.50	μg/L	52	1,2,4-Trimethylbenzene	ND	0.5	-
18	1,2-Dichloroethane	ND	0.50	μg/L	53	sec-Butylbenzene	ND	0.5	0 μg/L
19	1,1,1-Trichloroethane	ND	0.50	μg/L	54	1,3-Dichlorobenzene	ND	0.5	0 μg/L
20	1,1-Dichloropropene	ND	0.50	μg/L	55	1,4-Dichlorobenzene	ND	0.5	_
21	Carbon tetrachloride	ND	0.50	μg/L	56	4-Isopropyltoluene	ND	0.5	0 μg/L
22	Benzene	ND	0.50	μg/L	57	1,2-Dichlorobenzene	ND	0.5	0 µg/L
23	Dibromomethane	ND	0.50	μg/L	58	n-Butylbenzene	ND	0.5	0 µg/L
24	1,2-Dichloropropane	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBC)	P) 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.	
28	cis-1,3-Dichloropropene	ND	0.50	μg/L	63	1,2,3-Trichlorobenzene	ND	1.	-
29	trans-1,3-Dichloropropene	ND	0.50	μg/L	64	Surr: 1,2-Dichloroethane-d4	114	(70-130	
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					
~ 4	4.0.0% (50.0%	1		. 🕶					

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

ND

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

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

1,2-Dibromoethane (EDB)

Roger Scholl

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.

μg/L

**Report Date** 



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#### ANALYTICAL REPORT

Battelle Memorial Institute 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-06A

Client I.D. Number: EB-11-09/07/11

Attn: David Conner Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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	•	ND	0.50	μg/L
18	1,2-Dichloroethane	ND	0.50	μg/L	53	sec-Butvlbenzene	- 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-Dichloroberizene	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 (DBC	J.	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	- •		1	( =,	
33	Dibromochloromethane	ND	0.50	µg/L					
24	4.0 Diberry of bear (EDD)	<u>_</u>	2.00	-9-					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Soulmen

ND

Walter Hirihour

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

1.0

μg/L

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



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-07A

Client I.D. Number: TB-11-09/07/11

David Conner Attn:

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
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 (DBC	P) 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-Trichioroethane	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			1	,,	
33	Dibromochloromethane	ND	0.50	μg/L					
34	1,2-Dibromoethane (EDB)	ND	1.0	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Tetrachloroethene

Roger Scholl

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

µg/L

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.

**Report Date** 



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-08A

Client I.D. Number: MW-11-4

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Xvlene	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	·, · · · · · · · · · · · · · · · · ·	ND	0.50	μg/L	59	1,2-Dibromo-3-chloropropane (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Soulner

ND

Walter Hirkory

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

1.0

μg/L

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** 



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

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-09A

Client I.D. Number: MW-11-3

Attn: David Conner

Phone: (619) 726-7311

Fax: (614) 458-6641

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 L	imit
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-Tetrachioroethane	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-Chiorotoluene	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 (DBCI	P) 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					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

35 Tetrachloroethene

Roger Scholl

ND

Kandy Saulner

Walter Hinkow

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



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#### **ANALYTICAL REPORT**

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

Job: 100006114/

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-10A

Client I.D. Number: MW-11-2

Attn: David Conner

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

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 L	imit
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	
3	Vinyt chloride	ND	0.50	μg/L	38	Ethylbenzene	ND	0.50	
4	Chloroethane	ND	0.50	μg/L	39	m,p-Xylene	ND	0.50	
5	Bromomethane	ND	1.0	μg/L	40	Bromoform	ND	0.50	
6	Trichlorofluoromethane	ND	0.50	μg/L	41	Styrene	ND	0.50	
7	1,1-Dichloroethene	ND	0.50	μg/L	42	o-Xylene	ND	0.50	
8	Dichloromethane	ND	1.0	μg/L	43	1,1,2,2-Tetrachloroethane	ND	0.50	
9	Freon-113	ND	0.50	μg/L	44	1,2,3-Trichloropropane	ND	1.0	. •
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	
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-Butvlbenzene	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 (DBCI	P) 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			1	,	
33	Dibromochloromethane	ND	0.50	μg/L					

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl Kandy Soulur

ND

Walter Finn

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

1.0

μg/L

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** 



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#### **ANALYTICAL REPORT**

**Battelle Memorial Institute** 655 West Broadway

San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-11A

Client I.D. Number: MW-11-1

Attn: David Conner

Phone: (619) 726-7311 Fax:

(614) 458-6641

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 L	imit
1	Dichlorodifluoromethane	ND	0.50	µg/L	36	1,1,1,2-Tetrachioroethane	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-Isopropyitoluene	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 (DBC)	P) 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					
~ .		1							

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachioroethene

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1.0

μg/L

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.

**Report Date** 



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# ANALYTICAL REPORT

Battelle Memorial Institute

655 West Broadway San Diego, CA 92101

100006114/JPL Groundwater Monitoring

Alpha Analytical Number: BMI11090825-12A

Client I.D. Number: DUPE-06-3Q11

**David Conner** Attn:

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

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 L	imit
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	•	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-Xvlene	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-Butvlbenzene	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		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 (DBCI	P) ND	2.5	μg/L
25	Trichloroethene	ND	0.50	μg/L	60	1,2,4-Trichloropenzene	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	μα/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			,	( / 00)	,
33	Dibromochloromethane	ND	0.50	µg/L					
24	1.2 Dibromoethana (EDD)		-,						

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

34 1,2-Dibromoethane (EDB)

Tetrachloroethene

Roger Scholl

ND

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

1.0

μg/L

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



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# **VOC Sample Preservation Report**

Work Order: BMI11090825 Job: 100006114/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pН	
11090825-01A	MW-12-5	Aqueous	2	
11090825-02A	MW-12-4	Aqueous	2	
I1090825-03A	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-06-3O11	Aqueous	2	



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<b>Date:</b>		QC Sumr	nary Repor	t		<b>Work Orde</b> 11090825	-
Method Blank File ID: 24		Type MBLK	Test Code: El	PA Method 300.0	Analysis Date:	09/09/2011 13:10	
Sample ID: MB-27283	Units : mg/L	Run	ID: IC 1 110909A	_	Prep Date:	09/09/2011 13:10	
Analyte	Result		<b></b>		UCL(ME) RPDRef		Qual
Chloride Phosphate, ortho - P Sulfate (SO4)	ND ND ND	0.5 0.5 0.5	· ·	. ,			
Laboratory Fortified Bl	lank	Type <b>LFB</b>	Test Code: EF	PA Method 300.0			
File ID: <b>25</b>			Batch ID: 2728	33	Analysis Date:	09/09/2011 13:28	
Sample ID: LFB-27283	Units : mg/L	. Run	ID: <b>IC_1_110909</b>	<b>\</b>	Prep Date:	09/09/2011 11:53	
Analyte	Result	PQL Sp	kVal SpkRefVal	%REC LCL(ME)	UCL(ME) RPDRef	Val %RPD(Limit)	Qual
Chloride	49.2	0.5	50	98 90	110		
Phosphate, ortho - P Sulfate (SO4)	5.04 101	0.5 0.5	5 100	101 90 101 90	110 110		
	101				110		_
Sample Matrix Spike File ID: 22		Type <b>LFM</b>	Batch ID: 2728	PA Method 300.0	Analysis Date:	09/09/2011 12:32	
Sample ID: 11090825-1	1ALFM Units : mg/L	Run I	ID: <b>IC_1_110909</b>	=	Prep Date:	09/09/2011 12:52	
Analyte	Result				UCL(ME) RPDRef		Qual
Chloride Phosphate, ortho - P Sulfate (SO4)	71.8 5.86 148	0.5 0.5 0.5	50 23.29 5 0 100 52.02	97 80 117 80 96 80	120 120 120 120		
Sample Matrix Spike Dr	uplicate	Type <b>LFMD</b>	Test Code: EF	PA Method 300.0			
File ID: <b>23</b>	•	••	Batch ID: 2728	33	Analysis Date:	09/09/2011 12:51	
Sample ID: 11090825-1	1ALFMD Units : mg/L	. Run I	D: <b>IC_1_110909</b> A		Prep Date:	09/09/2011 11:53	
Analyte	Result	PQL Sp	kVal SpkRefVal	%REC LCL(ME)	UCL(ME) RPDRef\	Val %RPD(Limit)	Qual
Chloride Phosphate, ortho - P Sulfate (SO4)	73.2 5.88 152	0.5 0.5 0.5	50 23.29 5 0 100 52.02	99.8 80 118 80 99.6 80	120 71.76 120 5.863 120 148.3	3 0.3(15)	

# **Comments:**



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<b>Date:</b> 20-Sep-11			QC Summary Report								Work Ord 1109082	
Method Bla File ID: 14 Sample ID: Analyte Perchlorate	nk MB-27294	Units : <b>µg/L</b> Result ND	Type PQL		Batch ID: : <b>IC_3_11</b> 0	2729 912A	4	hod 314.0	Prep	Date:	09/12/2011 16:18 09/12/2011 15:22 Val %RPD(Limit)	
Laboratory	Fortified Blank	NO	Туре	LFR	Test Cod	۵· ED	A Mot	hod 314.0		*****		
File ID: <b>15</b> Sample ID: Analyte	LFB-27294	Units : µg/L Result	PQL	Run ID	Batch ID: IC_3_110	2729 912A	4		Prep	Date:	09/12/2011 16:36 09/12/2011 15:22 Val %RPD(Limit)	Qual
Perchlorate		24.3			25		97	85	115	, Ita Bittor	var zora D(Emile)	
Sample Mat File ID: 31 Sample ID: Analyte	rix Spike 11090825-05ALFM	Units : <b>µg/L</b> Result	Type I	Run ID:	Batch ID: IC_3_110	27294 912A	4	hod 314.0	Prep	Date:	09/12/2011 21:31 09/12/2011 15:22 Val %RPD(Limit)	Qual
Perchlorate		26.6			25		106	80	120	THE DITO	vai 7014 D(Linity)	Guai
Sample Mat File ID: 32 Sample ID: Analyte	rix Spike Duplicate	Units : <b>µg/L</b> Result	Type I	Run ID:	Batch ID: IC_3_110	e: EP/ 27294 912A	A Meti	hod 314.0	Analy Prep	Date:	09/12/2011 21:49 09/12/2011 15:22 Val %RPD(Limit)	Qual
Perchlorate		23.2			25	0	93	80	120	26.6		
Comments												

Comments:



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<b>Date:</b> 21-Sep-11	QC Summary Report					
Method Blank File ID: 091211.B\019_M.D\ Sample ID: MB-27282	Type: MBLK Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/20  Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/20					
Analyte	Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD	(Limit) Qual				
Chromium (Cr)	ND 0.005					
Laboratory Control Spike File ID: 091211.B\020_M.D\	Type: LCS Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/20	11 14:15				
Sample ID: LCS-27282 Analyte	Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/20  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD					
Chromium (Cr)	0.0508	<del></del>				
Sample Matrix Spike File ID: 091211.B\025_M.D\ Sample ID: 11090825-05AMS Analyte	Type: MS Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/20  Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/201  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD	11 11:02				
Chromium (Cr)	0.051 0.005 0.05 0 102 70 130	(Lillin) Quar				
Sample Matrix Spike Duplicate File ID: 091211.B\026_M.D\ Sample ID: 11090825-05AMSD Analyte	Type: MSD Test Code: EPA Method 200.8  Batch ID: 27282 Analysis Date: 09/12/201  Units: mg/L Run ID: ICP/MS_110912A Prep Date: 09/09/201  Result PQL SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD	11 11:02				
Chromium (Cr)		)(20)				

### Comments:



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Date: 21-Sep-11	QC Summary Report						<b>Work Order:</b> 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	R	un ID:	MSD_15_110916B		Prep Date:	09/16/2011 10:11				
Analyte	Result	PQL		al SpkRefVal %REC LCL(	ME) UCI	.(ME) RPDRef\	/al %RPD(Limit)	Qual			
Dichlorodifluoromethane	ND	0.5			<del></del>						
Chloromethane	ND	1									
Vinyl chloride	ND	0.5									
Chloroethane	ND	0.5									
Bromomethane Trichlorofluoromethane	ND	1									
1,1-Dichloroethene	ND ND	0.5 0.5									
Dichloromethane	ND	0.5									
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) cis-1,2-Dichloroethene	ND	10									
Bromochloromethane	ND ND	0.5 0.5									
Chloroform	ND	0.5									
2,2-Dichloropropane	ND	0.5									
1,2-Dichloroethane	ND	0.5									
1,1,1-Trichloroethane 1,1-Dichloropropene	ND	0.5									
Carbon tetrachloride	ND ND	0.5 0.5									
Benzene	ND	0.5									
Dibromomethane	ND	0.5									
1,2-Dichloropropane	ND	0.5									
Trichloroethene	ND	0.5									
Bromodichloromethane 4-Methyl-2-pentanone (MIBK)	ND	0.5									
cis-1,3-Dichloropropene	ND ND	2.5 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 1,2-Dibromoethane (EDB)	ND ND	0.5									
Tetrachloroethene	ND ND	1 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 Styrene	ND	0.5									
o-Xylene	ND ND	0.5 0.5									
1,1,2,2-Tetrachloroethane	ND	0.5									
1,2,3-Trichloropropane	ND	1									
Isopropylbenzene	ND	0.5									
Bromobenzene n-Bronylbenzene	ND	0.5									
n-Propylbenzene 4-Chlorotoluene	ND ND	0.5									
2-Chlorotoluene	ND ND	0.5 0.5									
1,3,5-Trimethylbenzene	ND	0.5									
tert-Butylbenzene	ND	0.5									
1,2,4-Trimethylbenzene	ND	0.5									
sec-Butylbenzene 1,3-Dichlorobenzene	ND	0.5									
1,4-Dichlorobenzene	ND ND	0.5 0.5									
4-Isopropyltoluene	ND ND	0.5 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 Naphthalene	ND	1									
Napntnaiene Hexachlorobutadiene	ND ND	1 1									
1,2,3-Trichlorobenzene	ND ND	1									
Surr: 1,2-Dichloroethane-d4	11.1	•	1	0 111 70	) 1:	30					
Surr: Toluene-d8	9.69		1			30					



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<b>Date:</b> 21-Sep-11	QC	Summary Rep	ort			<b>Work Order:</b> 11090825
Surr: 4-Bromofluorobenzene	8.84	10	88	70	130	



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<b>Date:</b> 21-Sep-11		(	QC S	ummar	y Report			<b>Work Or</b> 110908	
	Control Spike	•							
File ID: 11091				В	atch ID: <b>MS15W09</b> 1	16M	Analysis I	Date: 09/16/2011 09:00	6
Sample ID:	LCS MS15W0916M	Units : µg/L			SD_15_110916B		Prep Date		6
Analyte		Result	PQL	SpkVal	SpkRefVal %REC	LCL(ME)	) UCL(ME) RP	DRefVal %RPD(Limit)	Qual
Dichlorodifluo		9.59		10		70	130		
Chloromethan Vinyl chloride		12.1 10.9	2		121	70 70	130 130		
Chloroethane		11.9			109 119	70 70	130		
Bromomethan		9.73	2		97	70	130		
Trichlorofluoro 1,1-Dichloroet		12.9	•		129	70	130		
Dichlorometha		10.3 10.1	2		103 101	70 70	130 130		
Freon-113	ano	11.8			118	70 70	130		
trans-1,2-Dich		10.5	1		105	70	130		
Methyl tert-but	tyl ether (MTBE)	11.7	0.5		117	70	130		
1,1-Dichloroet 2-Butanone (N		10.7	1		107	70	130		
cis-1,2-Dichlor		252 10.6	10		126 106	70 70	130 130		
Bromochloron		11.4	-		114	70	130		
Chloroform		11.1	1		111	70	130		
2,2-Dichloropr	-	11.2	1		112	70	130		
1,2-Dichloroet		11.7	1		117	70 70	130		
1,1-Dichioropr		11.2 11.5	1		112 115	70 70	130 130		
Carbon tetracl	= =	10.6	1		106	70	130		
Benzene		10.9	0.5		109	70	130		
Dibromometha		11.6	1		116	70	130		
1,2-Dichloropr Trichloroethen		10.5	1		105	70	130		
Bromodichloro	•	10.8 10.8	1		108 108	70 70	130 130		
	ntanone (MIBK)	31	2.5		124	20	182		
cis-1,3-Dichlor	ropropene	10.7	1		107	70	130		
trans-1,3-Dich		10.3	1		103	70	130		
1,1,2-Trichlord	bethane	11.4	1		114	70	130		
1,3-Dichloropr	onane	10.5 10.6	0.5		105 106	70 70	130 130		
Dibromochloro		8.94	1		89	70	130		
1,2-Dibromoet		21.4	2		107	70	130		
Tetrachloroeth		10.5	1		105	70	130		
1,1,1,2-Tetrac		10.5	1		105	70	130		
Ethylbenzene	C	10.3 11.1	0.5		103 111	70 70	130 130		
m,p-Xylene		11	0.5		110	70 70	130		
Bromoform		8.56	1		86	70	130		
Styrene		9.44	1		94	70	130		
o-Xylene 1,1,2,2-Tetracl	hloroethane	11	0.5		110	70 70	130		
1,2,3-Trichloro		10.4 22.7	1		104 113	70 70	130 130		
Isopropylbenze	- ·	9.69	1		97	70	130		
Bromobenzen		10.2	1	10	102	70	130		
n-Propylbenze		10.1	1	10	101	70	130		
4-Chlorotoluen 2-Chlorotoluen		9.82 9.62	1	10	98 06	70 70	130		
1,3,5-Trimethy		10.3	1	10 10	96 103	70 70	130 130		
tert-Butylbenze	ene	10	1	10	100	70	130		
1,2,4-Trimethy		10.4	1	10	104	70	130		
sec-Butylbenze 1,3-Dichlorobe		9.92	1		99	70	130		
1,4-Dichlorobe		10.6 9.78	1	10 10	106 98	70 70	130 130		
4-Isopropyltolu		9.78 10.3	1		98 103	70 70	130		
1,2-Dichlorobe	enzene	9.81	1	10	98	70	130		
n-Butylbenzen		10.7	1	10	107	70	130		
	-chloropropane (DBCP)	51.1	3		102	67	130		
1,2,4-Trichloro Naphthalene	poenzene	9.77 9.44	2		98 94	70 70	130		
Hexachlorobut	tadiene	9.44 20.5	2 2		94 103	70 70	130 130		
1,2,3-Trichloro	benzene	10.4	2		104	70 70	130		
Surr: 1,2-Dichle		11.4		10	114	70	130		
Surr: Toluene-	·uo	9.49		10	95	70	130		



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<b>Date:</b> 21-Sep-11	<b>Work Order:</b> 11090825					
Surr: 4-Bromofluorobenzene	9.01	10	90	70	130	



1,2,3-Trichlorobenzene

Surr: Toluene-d8

Surr: 1,2-Dichloroethane-d4

40.2

47.8

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Date: Work Order: QC Summary Report 21-Sep-11 Sample Matrix Spike 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 Prep Date: 09/16/2011 10:32 Run ID: MSD\_15\_110916B Analyte Result **PQL** SpkVal SpkRefVal %REC LCL(ME) UCL(ME) RPDRefVal %RPD(Limit) Qual Dichlorodifluoromethane 47.8 2.5 Chloromethane 56.7 Vinvl chloride 56.2 2.5 n Chloroethane 56.1 2.5 **Bromomethane** 44.7 Trichlorofluoromethane 60.4 2.5 Λ 1.1-Dichloroethene 46.1 2.5 Dichloromethane 43.8 O Freon-113 52.7 2.5 trans-1.2-Dichloroethene 46.1 2.5 Methyl tert-butyl ether (MTBE) 48.6 1.3 1,1-Dichloroethane 46.8 2.5 Λ 2-Butanone (MEK) cis-1,2-Dichloroethene 46.2 2.5 Bromochloromethane 48.1 2.5 Chloroform 2.5 2,2-Dichloropropane 2.5 1,2-Dichloroethane 2.5 99.9 1,1,1-Trichloroethane 48.4 2.5 1,1-Dichloropropene 49.9 99.8 2.5 Carbon tetrachloride 46.4 2.5 Benzene 47 A 1.3 Dibromomethane 48.3 2.5 1,2-Dichloropropane 45.4 2.5 Trichloroethene 46.5 2.5 Bromodichloromethane 44.7 2.5 4-Methyl-2-pentanone (MIBK) cis-1,3-Dichloropropene 44.3 2.5 trans-1,3-Dichloropropene 41.5 2.5 1,1,2-Trichloroethane 47.7 2.5 Toluene 45.1 1.3 1,3-Dichloropropane 44.1 2.5 Dibromochloromethane 36.1 2.5 1,2-Dibromoethane (EDB) 88.1 Tetrachloroethene 45.5 2.5 1,1,1,2-Tetrachloroethane 44.1 2.5 Chlorobenzene 44.3 2.5 Ethylbenzene 48.2 1.3 m,p-Xylene 47 2 n **Bromoform** 33.5 2.5 Styrene 40.3 2.5 o-Xylene 47.1 1.3 1.1.2.2-Tetrachloroethane 42.4 2.5 1,2,3-Trichloropropane 92.1 Isopropylbenzene 43.4 2.5 Bromobenzene 44.3 2.5 n-Propylbenzene 44 9 2.5 4-Chlorotoluene 42.8 2.5 2-Chlorotoluene 43.1 2.5 1,3,5-Trimethylbenzene 46 1 2.5 tert-Butylbenzene 44.7 2.5 1,2,4-Trimethylbenzene 2.5 sec-Butylbenzene 44.2 2.5 1,3-Dichlorobenzene 2.5 1,4-Dichlorobenzene 42.5 2.5 4-Isopropyltoluene 2.5 1.2-Dichlorobenzene 42.2 n-Butylbenzene 46.9 2.5 1,2-Dibromo-3-chloropropane (DBCP) 1.2.4-Trichlorobenzene Naphthalene 36.4 Hexachlorobutadiene 



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<b>Date:</b> 21-Sep-11	QC	Summary Rep	port			<b>Work Order:</b> 11090825
Surr: 4-Bromofluorobenzene	46.2	50	92	70	130	



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**Date:** 21-Sep-11

# QC Summary Report

Work Order: 11090825

21-Sep-11		- <del>}</del>	IIIIIai y I	Copor					1109082	2.5
Sample Matrix Spike Duplicate File ID: 11091608.D		Type: MS				hod SW82	60B			
Sample ID: 11090825-05AMSD	Half "	_		ID: MS1		16M	•		9/16/2011 10:54	
Analyte	Units : µg/L		Run ID: MSD				Prep I	_	9/16/2011 10:54	ļ
Dichlorodifluoromethane	Result	PQL					UCL(ME)	RPDRefVal	%RPD(Limit)	Qu
Chloromethane	47.2	2.5	50	0	94	21	138	47.83	1.4(33)	
Vinyl chloride	54.4 62.9	10 2.5	50 50	0	109	23	144	56.72	4.3(27)	
Chloroethane	53.7	2.5 2.5	50 50	0	126 107	49 21	136 159	56.16 56.06	11.3(21)	
Bromomethane	32	10	50	ő	64	10	174	44.69	4.4(40) 33.2(40)	
Trichlorofluoromethane	63.5	2.5	50	Ö	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 Freon-113	43.3	10	50	0	87	69	130	43.77	1.1(20)	
trans-1,2-Dichloroethene	55.7	2.5	50	0	111	55	141	52.73	5.6(40)	
Methyl tert-butyl ether (MTBE)	49 51.8	2.5 1.3	50 50	0	98 104	63	130	46.14	6.1(20)	
1,1-Dichloroethane	49.3	2.5	50 50	0	99	47 66	150 130	48.56 46.79	6.4(40)	
2-Butanone (MEK)	812	50	1000	0	81	23	182	859.6	5.2(20) 5.7(22)	
cis-1,2-Dichloroethene	47	2.5	50	ŏ	94	70	130	46.19	1.7(20)	
Bromochloromethane	47.6	2.5	50	0	95	70	132	48.12	1.1(20)	
Chloroform 2,2-Dichloropropane	50	2.5	50	0	99.9	70	130	47.99	4.0(20)	
1,2-Dichloroethane	51.8	2.5	50	0	104	38	154	49.01	5.5(22)	
1,1,1-Trichloroethane	50.3 51.2	2.5 2.5	50 50	0	101	65 65	134	49.96	0.7(20)	
1,1-Dichloropropene	51.2 51.6	2.5 2.5	50 50	0	102 103	65 60	136	48.41	5.6(20)	
Carbon tetrachloride	49.2	2.5	50 50	0	98	68 58	132 148	49.9 46.4	3.3(20) 5.9(20)	
Benzene	48.4	1.3	50	ő	97	59	138	47.42	1.9(21)	
Dibromomethane	46.8	2.5	50	Ō	94	70	130	48.25	3.1(20)	
1,2-Dichloropropane Frichloroethene	44.6	2.5	50	0	89	70	131	45.41	1.7(20)	
Bromodichloromethane	46.7	2.5	50	0	93	65	144	46.52	0.4(20)	
1-Methyl-2-pentanone (MIBK)	44.8 111	2.5	50	0	90	50	157	44.69	0.2(20)	
cis-1,3-Dichloropropene	39.5	13 2.5	125 50	0	89	20	182	123.9	10.9(20)	
rans-1,3-Dichloropropene	34.5	2.5	50 50	0	79 69	63 65	131 136	44.34 41.53	11.5(20)	
1,1,2-Trichloroethane	43.2	2.5	50	Ö	86	70	131	47.67	18.6(20) 9.8(20)	
Foluene	49.1	1.3	50	ŏ	98	68	130	45.1	8.4(20)	
I,3-Dichloropropane Dibromochloromethane	45.9	2.5	50	0	92	70	130	44.12	3.9(20)	
1,2-Dibromoethane (EDB)	38.6	2.5	50	0	77	42	155	36.07	6.8(20)	
Fetrachloroethene	92.5 48.4	5	100	0	92	70	130	88.08	4.9(20)	
1,1,1,2-Tetrachloroethane	46.4 45.9	2.5 2.5	50 50	0	97	65 70	130	45.54	6.0(20)	
Chlorobenzene	45.8	2.5	50 50	0 0	92 92	70 70	130 130	44.1	3.9(20)	
thylbenzene	49.4	1.3	50	0	99	68	130	44.31 48.23	3.3(20) 2.5(20)	
n,p-Xylene	48.2	1.3	50	ŏ	96	68	131	47.2	2.0(20)	
Bromoform Styrene	36.5	2.5	50	0	73	65	143	33.48	8.7(20)	
-Xylene	41.2	2.5	50	0	82	59	153	40.28	2.2(37)	
,1,2,2-Tetrachloroethane	48.2	1.3	50	0	96	70	130	47.11	2.2(20)	
,2,3-Trichloropropane	43.8 94.9	2.5 10	50 100	0	88	67	130	42.39	3.3(20)	
sopropylbenzene	43.2	2.5	100 50	0	95 86	70	130	92.1	3.0(20)	
Bromobenzene	44.4	2.5	50 50	ő	89	55 70	138 130	43.37 44.3	0.4(20) 0.2(20)	
-Propylbenzene	44.5	2.5	50	Ö	89	67	133	44.86	0.7(30)	
-Chlorotoluene	42.7	2.5	50	Ō	85	70	130	42.76	0.1(20)	
-Chlorotoluene ,3,5-Trimethylbenzene	42.7	2.5	50	0	85	70	130	43.11	0.9(20)	
ert-Butylbenzene	45.9	2.5	50	0	92	67	134	46.14	0.6(21)	
,2,4-Trimethylbenzene	44.1 45.8	2.5	50	0	88	55 65	147	44.73	1.4(20)	
ec-Butylbenzene	45.8 43.8	2.5 2.5	50 50	0 0	92 88	65 69	135	46.02	0.4(25)	
,3-Dichlorobenzene	46.9	2.5	50 50	0	88 94	68 70	135 130	44.18 46.07	1.0(20)	
4-Dichlorobenzene	42.6	2.5	50	Ö	85	70 70	130	46.07 42.54	1.8(20) 0.1(20)	
-Isopropyltoluene	45.3	2.5	50	ŏ	91	68	132	46.03	1.6(20)	
,2-Dichlorobenzene	43.3	2.5	50	ō	87	70	130	42.16	2.7(20)	
-Butylbenzene 2-Dibromo-3-chloropropos (DBCD)	46.6	2.5	50	0	93	62	134	46.88	0.6(21)	
,2-Dibromo-3-chloropropane (DBCP) ,2,4-Trichlorobenzene	231	15	250	0	92	64	130	202.9	13.1(20)	
aphthalene	47.5 40.4	10	50	0	95	62	133	39.98	17.2(29)	
exachlorobutadiene	49.1 99.5	10 10	50 100	0	98	32	166	36.36	29.8(40)	
2,3-Trichlorobenzene	53.8	10 10	100 50	0	99 108	63 55	130	87 40.2	13.4(21)	
urr: 1,2-Dichloroethane-d4	54.6	10	50 50		108 109	55 70	138 130	40.2	28.9(36)	
urr: Toluene-d8	51.3		50		103	70 70	130			



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

<b>Date:</b> 21-Sep-11	QC	QC Summary Report						
Surr: 4-Bromofluorobenzene	45.4	50	91	70	130	11090825		
<del></del>								

Comments:

# 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

Report Attention Phone Number (619) 726-7311 x EMail Address

Battelle Memorial Institute

655 West Broadway

Suite 1420

Shane Walton (614) 424-4899 (614) 424-4117 x waltons@battelle.org cutiee@batelle.org connerd@battelle.org

Client's COC #: 26618

Job: 100006114/JPL Groundwater Monitoring

287215

San Diego, CA 92101

QC Level: DS4

Page: 1 of 2

WorkOrder: BMIS11090825

Report Due By: 5:00 PM On: 21-Sep-11

EDD Required: Yes

Sampled by: Chase Brogdon

Cooler Temp Samples Received 08-Sep-11 Date Printed 08-Sep-11

BMI11090825-10A MW-11-2 BMI11090825-04A MW-12-2 Sample ID BMI11090825-09A MW-11-3 BMI11090825-08A BMI11090825-07A TB-11-09/07/11 BMI11090825-06A BMI11090825-05A BMI11090825-03A BMI11090825-02A MW-12-4 BMI11090825-01A MW-12-5 MW-11-4 MW-12-1 MW-12-3 EB-11-09/07/11 Client Sample ID = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates å Ş ğ å Š Š å å Matrix Date g AQ 09/07/11 09:10 09/07/11 12:38 09/07/11 12:16 09/07/11 07:30 09/07/11 10:29 09/07/11 10:42 09/07/11 10:11 09/07/11 09:28 09/07/11 11:51 09/07/11 09:51 Collection No. of Bottles Alpha S G ω 5 4 G G S 4 Sub 0 0 0 0 0 0 0 0 0 0 TAT 9 9 9 9 9 9 9 9 9 9 300\_0\_W Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ ü Ω Ç Ç Ö Ç VOC by 524 VOC by 524 Criteria Criteria Requested Tests VOC\_W Reno Trip Blank 6/7/11 Sample Remarks MS/MSD MS/MSD

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: Munday Signature **Print Name** Alpha Analytical, Inc. Company 9/8/11 1125 Date/Time

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 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.

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

Client:

Battelle Memorial Institute

655 West Broadway

Suite 1420

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

Client's COC #: 26618

.. 9

100006114/JPL Groundwater Monitoring

287215

San Diego, CA 92101

WorkOrder: BMIS11090825

Page: 2 of 2

Report Due By: 5:00 PM On: 21-Sep-11

EDD Required: Yes

Sampled by: Chase Brogdon

Cooler Temp 0°C Samples Received 08-Sep-11 Date Printed 08-Sep-11

Sample ID Alpha BMI11090825-12A DUPE-06-3Q11 BMI11090825-11A MW-11-1 QC Level: DS4 Client Sample ID = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates AQ 09/07/11 00:00 AQ 09/07/11 13:16 Collection No. of Bottles Alpha S Sub 0 0 Ā 9 9 CI, NO2, NO3, PO4, SO4 CI, NO2, NO3, PO4, SO4 300 0 W Perchlorate Perchlorate 314\_W METALS\_D VOC\_TIC\_ Ç ζ VOC by 524 VOC by 524 Criteria Criteria VOC by 524 VOC by 524 Criteria Criteria Requested Tests VOC\_W Sample Remarks

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:	
Kumay	Signature
16 Minny	Print Name
Alpha Analytical, Inc.	Сотрапу
9/8/11 1125	Date/Time

Matrix Type: AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) 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 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. Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:		AI A   A   I	Samples Collected From Wi	hich State? 26618
/ GERALD	TOMPKINS	Alpna Analytical, Inc. 255 Glendale Avenue, Suite 21	CA ×	
KING AVE.		Sparks, Nevada 89431-5778	ID OR OTHER	Page # _ /_ of _ /
City, State, Zip <u>くの(いぬぼいく , のみ</u>	43201 (NY)	Fax (775) 355-0406	Analyses Required	ed /
		111100001		
BUTTEILE DAVID CONNER	1	Job# 6-005862 (2)		/ Required QC Level?
Address 3990 010 TOWN AUE C-205		BUTTElle ORG	200 200 200 200 200 200 200 200 200 200	
City, State ZID DIEGO, CA 92110	Phone # (6(9) 726-7311	H 99-854 (199) xBH	R	EDD / EDF? YES NO
Time Date See Key Suppled by Suppled by	Report Attention LONNEN	•	CS HI C	Global ID #
	ğ	TAT Field ** See below	TO+ PER	REMARKS
010 9/7/1 AQ BM111090825-01	1 mw - 12-5	No can 4 No cook	X	
0928 62	2 mw-12-4	1 4 /VARIOUS	X	
03	3 MW - 12 - 3	5/VARIOK	XXX	
ho ho	1 MW-12-2	5 NARIOS	XXX	
05	5 mw-12-1	10 VANTOUS	XXX	ms/msD
06	6 EB-11-08/07/11	3020	×	COMPANT BLANK
оно <i>9/4/</i> // 07	7 78-11-09/07/11		X	They Brank.
1151 9/2/1	8 mw-11-4	かか	X	ms/msD
1216 09	MW-11-3	3,20	×××	,
10	MW-11-2	2	, ,	
13/6	MW-11-1	3, 20	× × ×	
12	Dupe-06-3011	<b>▼</b> 3, 2,	× × ×	Duplicate
ADDITIONAL INSTRUCTIONS:				
Signature	Print Name		Company	Date Time
Relinquishedby	CHARE BROWN	I-MUNT1	- vec Inc	0(4) 1/4/8
Received by	Arthan STAR	K Alph.	Aristice	OCh, Whole
Relinquished by	1.	( (	20	9/4/1, 1430
Received by L.M.M.C.M.	KMURAY	AAN		9/8/11 1110
Received by				
*Key: AQ - Aqueous SO - Soil WA - Waste	aste OT - Other AR - Air	**: L-Liter V-Voa S-Soil Jar	O-Orbo T-Tedlar B-Brass	s P-Plastic OT-Other

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.

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



## 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

The Judesta

Sue Anderson Project Manager



Client: Battelle CAS Project No: P1103204

JPL-GW-3Q11 / 100006114 Project:

# **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.

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.



P1103204-001

Water

8/23/2011

MW-7

DETAIL SUMMARY REPORT Client: Battelle Service Request: P1103204 Project ID: JPL-GW-3Q11 / 100006114 Date Received: 8/23/2011 Time Received: 16:03 Date Time Client Sample ID Lab Code Matrix Collected Collected

10:35

P1103204\_Detail Summary\_1108290922\_RG.xls - DETAIL SUMMARY

PEF\_Detail.xls

# Columbia Analytical Services, Inc.

### Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

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

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# Columbia Analytical Services<sup>M</sup>

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

으

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

Phone Client Sample ID Project Manage Company Name & Address (Reporting Information) Email Address Owned Company pastelle och Fax Fax (805) 526-7270 Laboratory ID Number Collected Sampler (Print & Sign) Collected P.O. # / Billing Information 285 65 1 Batter Project Number Project Name SS 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 Matrix Containers Number of Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas [] ΓPH Gas 8015B □ 3TEX 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) Analysis Method and/or Analytes Preservative Code CAS¹ Contact CAS Project No Preservative Key Remarks Other NaOH H2SO4 HN03 된 None Asc Acid Zn Acetate

		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
1 - MW-7	%3/11035 AQ	8 X	
		-	
Report Tier Levels - please select			Project Requirements (MRLs, QAPP)
Tier II - (Results/Default if not specified)	Tier III - (Data Validation Package) 10% Surcharge X. Tier V - (client specified)	0% Surcharge X MRL required Yes / No MDL / PQL / J required Yes / No	Type:
Relinquished by: (Signature)	Control 11-Effective	Received by: (Signature)	
Relinquished by: (Signature)	COSOL VERBE		Date: 3731/ Time: [37]   Cooler / Blank / Joe / No Ice
Relinquished by (Signature)	Date Time :	Hecesyld by (Stappitore)	Dates 13// Time 605 Temperature

# Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103204

JPL-GW-3Q11/100006114 Project:

<b>Bottle ID</b>	ttle ID Tests		Time	Sample Location / User	Disposed On
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**

-	Battelle	/ 12000 1111				Work order:	P1103204			
	JPL-GW3Q11 s) received on:			,	Date opened:	9/22/11	h	SSTAF	OL EC	
• `		samples received by CAS.	The use of this for				by:			
		Thermal preservation and p		-	-	_			ation of	
	,	F F	,		1	<b>1</b>		Yes	<u>No</u>	N/A
1	Were sample	<b>containers</b> properly n	narked with cl	ient sample ID	)?			X		
2	Container(s) s	upplied by CAS?						X		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Were chain-of	<b>f-custody</b> papers used	and filled out	?				X		
5	Did sample co	ontainer labels and/or	tags agree wi	ith custody par	pers?			X		
6	Was sample v	<b>rolume</b> received adequ	ate for analys	is?				X		
7	Are samples w	vithin specified holdin	g times?					X		
8	Was proper te	<b>mperature</b> (thermal p	reservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Tem	perature: ° C Blank	k Temperature	e: 3° C		Wet	Ice			
9	Was a <b>trip bla</b>	ank received?								X
10	Were custody	seals on outside of co	oler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int	act?								X
	Were custody	seals on outside of sar	mple containe	r?					X	
		Sealing Lid?			X					
	Location of seal(s)? Sealing Lid Were signature and date included?									
	Were seals int	act?								X
11		rs have appropriate <b>pr</b> nt indication that the s		•		Client specified i	nformation?			X
		ials checked for prese								$\overline{\mathbf{x}}$
		t/method/SOP require			ample pH and	d if necessary alte	er it?			×
	Tubes:	Are the tubes cap	•		ampie pri and	i <u>ii necessary</u> and	21 It:			X
12	Tubes.	•		•						X
13	Badges:	Do they contain mare the badges p		d and intact?						$\boxtimes$
13	Dauges.	Are dual bed badg			lri oonnad ond	lintaat?				$\boxtimes$
			ges separateu a	ilia iliaiviauail	ly capped and	I mtact:		<u> </u>	<u> </u>	
Lab S	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	_	ot / Preso Commei		
P1103204	-001.01	125mL Plastic NP								
Explain	any discrepanci	es: (include lab sample l	(D numbers):							

 $RSK - MEEPP, HCL \ (pH\!<\!\!2); RSK - CO2, \ (pH \ 5\text{-}8); \ Sulfur \ (pH\!>\!\!4)$ 

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	

Karu Rya

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 CCB2	0.010 0.010	0.003 0.003	ND ND

Approved By:

ICCBMDL/120594

WBMIX.XLT

Kau Rya

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
CCVI	0.0500	0.0514	103	90-110
CCV2	0.0500	0.0514	103	90-110

Approved B

Date:

WBMIX.XLT

Karu Rya

QA/QC Report

Client:

Battelle

JPL-GW-3Q11

Project Name : 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

Dasis . INA

						CAS Percent	
Analyte	Prep Method	Analysis Method	True Value	Result		Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0418	105	90-110	

Approved By

Kam Rya

Date

8/29/11

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

Lab Code:

P1103204-001MS

P1103204-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0470	0.0470	94	94	73-119	<1	

Karu Rya



pH Run Log										
Service Reques	t #(s):	PIIC	03199	1	01103204	P	1103705			
Time: <i>U807</i>				-		<b>,</b>				
Sample	V	WR lot#	Exp.		Slope		Prep.	Run#		
pH 2 Buffer	524-6	5201101	12/2012			7				
pH 4 Buffer	524-6	1520/102	9/30/12		£ 98,40/		Ru	ın#		
pH 7 Buffer	524-0	A5011554C	3/2013		10.4°C					
pH 10 Buffer	524-0	04261102	9/30/12							
pH in liquid: (1) 904		•				ethod num	ber in column labele	ed # below )		
pH adjustment:(5)	7196A,	(6) 7199 (Note i		ım	n labeled # )					
Sample	#	рН	Temp. ⁰C		Sample	#	рН	Temp. <sup>0</sup> C		
pH 2.000	5,6	1.997	21.10	1	P1103199-5.01	86	9.337	15.6°		
pH 4.000	1	3.989	21.3°		1-6019	gT	9.362	13.8		
pH 7.000		7.016	21.30		V -7.014		9.428	17.00		
pH 10.000		10.017	21.1"		P1103204-1.01	5	1.818	13.00		
Ref#: 524-05201105	13	7.398	21.30		P1103205-1.01	T	1.874	8,20		
DI	5	2.085	21,20		J -2.01	V	1.860	9.10		
DI ®	6	9.426	21.40		PH 2.000	5.6	2.016	21.0°		
OH10.000	56	10.021	21.40		/	•				
TIME: 1445	0	m			\					
DH 10,000	6	10,001	22.80				ſ			
P1103199-1.01		9.215	19.00			000	ull			
J-2.0 P		9,291	20.90		1 4	W.	y Wron	TA CALL DE CAL		
J-3.010		9,213	20.60		\ /	1				
011/0.000	4	10.011	21.90					and the state of t		
TIME 160	23	S						Carried Carried		
DH10-000 ~	5.6	10,003	2/120	Page 12				a contraction		
P1103199-4.87	6	9.138	15.60				1			
pH Adjustments:						,	014			
	<b>X719</b>	99A: Diluted I	VaOH <u>574-841</u>	51	102 EXP: 4/15	112				
Comments:	16.16	Ile of Gar	A MILANTI	17	/					
	H)PI	HELEO LLION	TO HADD	<i>A</i> .)	>/					
* Soil or Solid pre						past re	ecommended	hold time.		
			ion changed:		, ,					
Note: ATC probe	used	therefore, te	emperature co	rr	ection calculation	on is no	ot necessary.			
Analyst:					Date:	8/2	3/11			
Reviewer:		/ Ve			Date:	J. J.	15/11	nH YI S		

	Columbia		Hexavale	m (Liquids)			0.5		
	Analytical Service:	5™ M	lethod EP	À	7196A				88
	rvice Request#(s): P11032		03205	^-	Run#:	AL	8710		
0.	out: 524-0228/103 TV=10/	PM EXP	: 2/28/12		Pren Run#	:	-		
ic	VICCV#: 524-10/5/00/ 7.1	1=100P/m	EXF 3/20	2/2	Conc. H <sub>2</sub> Se	O4 Lot#: EM	0 44284	<u> [XP: 11/20/</u>	lug,
			3/00	je	Coloring R	eagent Ref#:	524-0822	1104 EXP	:9/22/11
	Working Curve:	Pr	ep Dilution		NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
		Concenti Absorbance	ration mg/L		0.00	0.01	0.05	0.1	0.999908467
		Absorbance	(w, 540 nm		0.000	0.010	0.057	0,113	
							Corrected		
		Sample	PI	\		Absorbance	Abs.	Results -	QA/QC - %R
	Sample #		Dilution		Bkg.	@ 540nm	(minus bkg.)	mg/L	/ RPD
1	ICB	iom	- 1	_	0,000	0.000	0.000	0.000426	10,003
2	ICV 0.05 APM		- 1		0.000	0.059	0.059	0.0523	105%
3	MB		- 6		0.000	0.000	0.000	0.000426	10,003
4	US 0.04PPM			ر	0.000	0.047	0.047	0.0418	105%
5	P11032055-1.01				0.000	0.601	0.001	0.00130	10.003
6	1-1.01 US0.05PP	ч		لمرا	0.000	0.048	0.048	0,0426	85%7 :10
7	1-1.01 USD I			/	0.000	0.048	0.048	0.0426	85% } RAZ
8	-   -2.0		-30-20-1		0.001	0,000	0.001	0.00130	20,003
9	11 -2.01 VS a 03/1	m	_		0.001	0.030	0.029	0.6259	86%
to	P110320\$-1.01			V	0.600	0.002	0.002	0.00218	10.003
11	T-1.014/50,00	FPM		١	0.000	0.053	0.053	0.0470	94% 7/19
2	V -1.01MSP T				0.000	0.053	0.053	0.0470	940 5 PM
13	ral 1				0.000	0.058	0-058	0.0514	103%
4	CCB1		-		0.000	0.000	0.000	0.000426	10.003
15	P1103204-1.01 VSa	3/An		ر	0.000	0.030	0.030	0.0268	89%
6	ava cosppm	i			10.000	0.058	0.058	0.0514	103%
17	CCB2		-		0,000	0.000	0.000	0.000426	10.003
				2.5			to pH adjustm		
es.	ICV/CCV spiked with _O, MS/MSD spiked with					-	•		
ì	MS/MSD spiked with LCS spiked with	•	529-0000			· ·	imple (T.V.= 0.9 I Water (T.V.=	• •	
$^{\circ}V$		0.2 mi oi. 0.3	ml of	 ,	•		1 water (1.v.= mple (T.V.=0c)	* * *	
as a	Comments:	<u> </u>	<u> </u>			51 561	Lee face, and	P P ***/	
						**************************************	- 1 /	,	
2	Prepared By:					Date/Time:	8/22/1	1 KWIA	00
	Analyzed By:					Data/Time	8/22/	1 (0) 121	· pr

Date:

Reviewed By: \_

. 40	
10/10/10	524-10061001 25133ppl Stock for 03
	At / harma
TW	
	EXP: 10/20/10
· · · · · · · · · · · · · · · · · · ·	
10/6/10	524-10061002 25133996 Jay/CV for 0:
4	0.05 ml Pyridine-4-carboxaldehyde TEI
	( <u>IGINC</u> ;Exp: \$/10/12 ) up to 500 ml w/ Dl Water.
	BXP: 10/20/10
1	
	524-1006/003 MBTH SO/M
10/6/10	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> EMO 49784; AF 11/2
	EXP: 10/7/10
	EXP. 10/7/10
15/11/16	Cost ractions of
10/15/10	524-10151001 Crot ICV Starle
	Purchased 100PM Craf
	FRICCA Chemical (b) Cut No 2095-16
	SDOM/ Plastic
į	10TH 121617
	LOT# 10/0/77
	EXP: 3/20/2
10/15/r	524-10151002 500PM NOZ Stock
	Puvchased
; <del>IDV</del>	PVA Chemical Co (ut No: 5444 5-4
.··	Recot Chemical Co (ut No: 5444.5-4

1:1H2 1,5-01 pheny Carbohy drazide (EMD 107 47/03) 1/30/13) 7 50 ml W/ACCHORI (AM) LOT \$471540; OXP: 9/24/12 EXP: 3/91/11 534-0228/10/ 0./WH2SOY 5.6 ml and 1-12 Dy (omo 49284 Oxp 11/20/14 524-0228/101 W/DI 470 EXP: 3/28/12 0228/102 1001 mg/ ON67 Ventures CGCR (6) ml Clear Glass D2-CR03040

- Difheny/carboll 8/2011 147020713B; CXP: 10/11/ (CMD 46321715B; EXP: DIOI H20 EXP: 4/17/11 wed And Aprroved By: 534-04141101 iox conc Givent exp 4/29/11 524-04291002 750m1 WIDI HZO.

NH3 FILLING ga 4/26/11 42504 (and 49284; Oxf: 11/2 1:142504 (524-042611 OH

3/20/3 524-04281101 OIN HZSUY 5-Diphenylcarbohydrazide (GTBaty Jose41; W 04 191101 (10 x ums spent: EXP: 9)

	V. ₽
Sign	594-05191103 ICO2 PCR
- Ja	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM JUSCH)  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 +9284 exp: n/20/14). Bring up to volume w/ DI H2O; mix and degas.
	QP: 5/24/11
-5/20/11	524-0520 1101 PH 2,000 BUFFER
- 9a	Purchasa BOH 5010-500 m L
	101# 1101225
	EXP:12/2012
5/30/11	534-0520402 PH 4.000 BURGER
-Sh	TT Byker CAT # 5657-01 500mL
	607# J36503
	EXP: 9/30/10
920/11	524-8520403 pt 7.38 BUTTER
	BDH CAT # BNHS058-500mL
	107# 1103360/
:	

Ţ.;	10	
Allendaria Salahari Barana	8bəlu	524-0822/104 Cr6+ Colorine feagle 0.25g 1,5-0ipheny(carbohydrazide (Jikirer; Jos 64, Exp. 6/15/15) I GIN W/ Actor (EMD:
		0,25g 1,5-Dipheny Carbohy drazide (Ji Biker: Jos 64)
		exe. 6/15/15) 9 40 ml N/ Acetone (EMD:
		(0747154D EXP: 9/24/12)
		011:9/20/11
		VII 1/100/11
	8/22/11	524-08221105 1000PM SOZ STOCK
	SV	
		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
-:		80.01-1
-		EXP: 9/5/11
-		
-	8/0/11	524-0822/106 100 pm 503 Ia/ca
		0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
j. ji fil		to 100 ml w/ DI Water.
		EXP: 9/5/4
"	8/23/11	524-08231101 1000 pplo Cr Stock
<b>-</b>	Sh	0/ml 524-02281102 (1001 ppm (r6+; exp: 3/1/12)
v		1 100 ml w/ f/+ ADJUSTED DI (pH=9.426).
		ar: 3/1/12
ا ات.		
	8/23/11	524-0823/102 250pp (Not Ia/Ca)
Monte		0.25 9.3 mL Ref 5.24 + 10 (5,700) (10 exp: 3/2012 up to 100
		mL with pH adjusted (pH= 9.426), degassed DI Water.
		Expi 9/6/1



### 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103205

JPL GW Mon 3Q11 / 100006114 Project:

### **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.

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.

X X



P1103205-001

P1103205-002

Water

Water

8/23/2011

8/23/2011

EB-01-8/23/11

SB-01-8/23/11

DETAIL SUMMARY REPORT Client: Battelle Service Request: P1103205 Project ID: JPL GW Mon 3Q11 / 100006114 Date Received: 8/23/2011 Time Received: 16:03 Date Time Client Sample ID Lab Code Matrix Collected Collected

11:20

11:29

### Columbia Analytical Services, Inc.

### Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

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

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

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

Page \_

Columbia Analytical Services \*\*c

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

N m 203 Phone (805) 526-7161 Requested Turnaround Time in Business Days (Surcharges) please circle C. Colympologid SYO! 1

Temperature °C	Cale:	The strength of the strength o	Sity ( datil) (9)	Lacebase of Lordings (A)	111(9)	Dala	THE		adicidation of (Signature)
Cooler /Blank / Ice / No Ice	23/1/		Computer Computer	Certification (Silventie)	1) :) :::::::::::::::::::::::::::::::::	Care S. W.S		aune Colonia	nemiquismed by (digitation)
	2021		Signature)	Received by: (Signature)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	28	R	alure	Helinquished by: (Signature)
	EDD required Yes / No Type:	Yes / No	MHL required Yes / No MDL / PQL / J required Yes / No	surcharge	] Fa	Tier V - (client specified)	Tier V - (c)	Tier II - (Results + QC)	Tier II - (Results + QC)
Project Requirements (MRLs, QAPP)					1			- please select	Report Tier Levels - please select
	1 1 1 1	1 1			- A X 1 C A			<b>A</b>	
							••••••••••••••••••••••••••••••••••••••		
						<b></b>			
Source BLANG		×		*******	3.5	1/129	8/23/17	13/11	58-01-8/23/
Eaupyners Brank					GL	11/20	8/12/18	(23/1)	CB-01-8
				-					
Remarks		Cx	Volatile Or 624 © 82 TPH Gas BTEX 802 TPH Diese TPH Diese TPH FC Semi-Vola 625 © 82	Number of E	Matrix	Time	Laboratory Date ID Number Collected	10 10	Client Sample (D
		<i>III</i>	608 □ C 8015B □ M 1B □ M el 8015B el Low Le □ 8015M tile Orga		Sign)	Marint &	Sampler (	Email Address for Result Reporting	Email Address to
/ Utner		(7	TBE (Suevel 80	43201	ABUS OH	COLUMBUS	186	7311 (614) 458-	F-74-619
		19	BO21: Boon Boon Boontr		ALL CASKALS CAMPLE	1. V. 1. 0			Phone
5 Zn Acetate	-	6) 	B [] tract [] (S acte		1/BATTELLE	28565		BUJER.	HAN'S
			ted) Subco	lion	Ē,	P.O. # / E			Project Manager
3 H2SO4					G486090	Gr/	7110	7 2 0 C Co 1 Co 1/1/0	10 0 01 C
			oted)		lumber	Project Number	) )	7 3 5	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
0 None		0			GEN MON	18/2	70WN AVE, C-205	o ナロジン A	3990 000
Preservative Key	te	Preservative Code					e e	BATTELLE	BATTELLE
CAS Contact:		ysis Method and/or Analytes	Analysis		vame	Project Name	ng Information)	& Address (Reporti	Company Name
		%) 5 Day (25%) 10 Day - Standard	1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%)	%) 2 Day (75%	1 Day (100°		Fax (805) 526-7270	<b>-</b>	ao Engayee - Owled California

### Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103205

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	

### 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

### **Sample Acceptance Check Form**

	Battelle					Work order:	P1103205			
		3Q11 / 100006114								
	s) received on:			•	Date opened:		by:	SSTAI		
		samples received by CAS.			-	=			cation of	
compliance	or nonconformity.	Thermal preservation and	pH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/	SOP. <b>Yes</b>	<u>No</u>	N/A
1	Were sample	containers properly i	narked with cl	ient sample II	<b>)</b> ?			X		
2	_	supplied by CAS?		1				X		
3	Did sample c	ontainers arrive in go	od condition?					X		
4	Were chain-o	f-custody papers used	l and filled out	?				X		
5	Did sample c	ontainer labels and/o	r tags agree w	ith custody pap	pers?			X		
6	Was sample v	volume received adeq	uate for analys	is?				X		
7	Are samples v	within specified holding	ng times?					X		
8	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Ten	nperature: ° C Blar	k Temperature	e: 3° C		Wet 1	<b>Ice</b>			
9	Was a trip bl	ank received?								X
10	Were custody	seals on outside of co	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	_	e and date included?								X
	Were seals in									$\overline{\times}$
Were custody seals on outside of sample container?  Location of seal(s)?  Sealing Lid?									$\overline{\times}$	
							Sealing Lid?			$\boxtimes$
	_	re and date included?								X
	Were seals in					~·· · · · · · · · · · · · · · · · · · ·				X
11		rs have appropriate <b>p</b> ent indication that the		•		Client specified i	nformation?			$\boxtimes$
		rials checked for prese								X
		nt/method/SOP require			ample pH and	d if necessary alte	er it?			X
12	Tubes:	Are the tubes cap	•							X
		Do they contain i	_							×
13	Badges:	Are the badges p		d and intact?						×
10		Are dual bed bad			lv capped and	d intact?				$\boxtimes$
Lah	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	ot / Pres	ervation	
Lub	oumpie 1D	Description	pH *	рН	pH	(Presence/Absence)		Comme		•
P1103205	5-001.01	125mL Plastic NP								
P1103205	5-002.01	125mL Plastic NP								
						<u> </u>				
_		ies: (include lab sample	ID numbers):							
Amended 1	project number j	per client instruction.								

 $RSK - MEEPP, HCL \ (pH\!<\!\!2); RSK - CO2, \ (pH \ 5\text{-}8); \ Sulfur \ (pH\!>\!\!4)$ 

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

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	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	

Kam Rya

QA/QC Report

Client: Project: Battelle

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

ICCBMDL/120594

Karu Rya

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

CCV1A/120594

Date

Kam Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q11

Project Number : Sample Matrix : 100006114 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

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0418	105	90-110	

Approved By

Report By:SAnderson

Karu Rya

Date: 8/29/

11 of 21

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

P1103205-001MS

P1103205-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike I MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0426	0.0426	85	85	73-119	<1	

Kam Rya



			pH Run	L	og			,
Service Reques	t #(s):	PIIC	03199	1	01103204	P	1103705	
Time: <i>U807</i>				-		<b>,</b>		
Sample	V	WR lot#	Exp.		Slope		Prep.	Run#
pH 2 Buffer	524-6	5201101	12/2012			7		
pH 4 Buffer	524-6	1520/102	9/30/12		£ 98,40/		Ru	ın#
pH 7 Buffer	524-0	A5011554C	3/2013		10.4°C			
pH 10 Buffer	524-0	04261102	9/30/12					
pH in liquid: (1) 904		•				ethod num	ber in column labele	ed # below )
pH adjustment:(5)	7196A,	(6) 7199 (Note i		ım	n labeled # )			
Sample	#	рН	Temp. ⁰C		Sample	#	рН	Temp. <sup>0</sup> C
pH 2.000	5,6	1.997	21.10	1	P1103199-5.01	86	9.337	15.6°
pH 4.000	1	3.989	21.3°		1-6019	gT	9.362	13.8
pH 7.000		7.016	21.30		V -7.014		9.428	17.00
pH 10.000		10.017	21.1"		P1103204-1.01	5	1.818	13.00
Ref#: 524-05201105	13	7.398	21.30		P1103205-1.01	T	1.874	8,20
DI	5	2.085	21,20		J -2.01	V	1.860	9.10
DI ®	6	9.426	21.40		PH 2.000	5.6	2.016	21.0°
OH10.000	56	10.021	21.40		/	•		
TIME: 1445	0	m			\			
DH 10,000	6	10,001	22.80				ſ	
P1103199-1.01		9.215	19.00			000	ull	
J-2.0 P		9,291	20.90		1 4	W.	y Wron	TA CALL DE CAL
J-3.010		9,213	20.60			1		
011/0.000	4	10.011	21.90					and the state of t
TIME 160	23	S						Carried Carried
DH10-000 ~	5.6	10,003	2/120	Page 12				a contraction
P1103199-4.87	6	9.138	15.60				1	
pH Adjustments:						,	014	
	<b>X719</b>	99A: Diluted I	VaOH <u>574-841</u>	51	102 EXP: 4/15	112		
Comments:	1616	Ile of Gar	A MILANTI	17	/			
	H)PI	HELEO LLION	TO HADD	<i>A</i> .)	>/			
* Soil or Solid pre						past re	ecommended	hold time.
			ion changed:		, ,			
Note: ATC probe	used	therefore, te	emperature co	rr	ection calculation	on is no	ot necessary.	
Analyst:					Date:	8/2	3/11	
Reviewer:		/ Ve			Date:	J. J.	15/11	nH YI S

	Columbia		Hexavale	nt	Chromiu	m (Liquids)			0.5
	Analytical Service:	5™ M	lethod EP	À	7196A				88
	rvice Request#(s): P11032		03205	^-	Run#:	AL	8710		
0.	out: 524-0228/103 TV=10/	PM EXP	: 2/28/12		Pren Run#	:	-		
ic	VICCV#: 524-10/5/00/ 7.1	1=100P/m	EXF 3/20	2/2	Conc. H <sub>2</sub> Se	O <sub>4</sub> Lot#: <i>EM</i> .	0 44284	<u> [XP: 11/20/</u>	lug,
			3/00	je	Coloring R	eagent Ref#:	524-0822	1104 EXP	:9/22/11
	Working Curve:	Pr	ep Dilution		NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
		Concenti Absorbance	ration mg/L		0.00	0.01	0.05	0.1	0.999908467
		Absorbance	(w, 540 nm		0.000	0.010	0.057	0,113	
							Corrected		
		Sample	PI	\		Absorbance	Abs.	Results -	QA/QC - %R
	Sample #		Dilution		Bkg.	@ 540nm	(minus bkg.)	mg/L	/ RPD
1	ICB	iom	- 1	_	0,000	0.000	0.000	0.000426	10,003
2	ICV 0.05 APM		- 1		0.000	0.059	0.059	0.0523	105%
3	MB		- 6		0.000	0.000	0.000	0.000426	10,003
4	US 0.04PPM			ر	0.000	0.047	0.047	0.0418	105%
5	P11032055-1.01				0.000	0.601	0.001	0.00130	10.003
6	1-1.01 US0.05PP	ч		لمرا	0.000	0.048	0.048	0,0426	85%7 :10
7	1-1.01 USD I			/	0.000	0.048	0.048	0.0426	85% } RAZ
8	-   -2.0		- January .		0.001	0,000	0.001	0.00130	20,003
9	11 -2.01 VS a 03/1	m	_		0.001	0.030	0.029	0.6259	86%
to	P110320\$-1.01			V	0.600	0.002	0.002	0.00218	10.003
11	T-1.014/50,00	FPM		١	0.000	0.053	0.053	0.0470	94% 7/19
2	V -1.01MSP T				0.000	0.053	0.053	0.0470	940 5 PM
13	ral 1				0.000	0.058	0-058	0.0514	103%
4	CCB1		-		0.000	0.000	0.000	0.000426	10.003
15	P1103204-1.01 VSa	3/An		ر	0.000	0.030	0.030	0.0268	89%
6	ava cosppm	i			10.000	0.058	0.058	0.0514	103%
17	CCB2		-		0,000	0.000	0.000	0.000426	10.003
	• •			2.74			to pH adjustm		
es.	ICV/CCV spiked with <u>o.</u> MS/MSD spiked with					-	•		
ì	MS/MSD spiked with LCS spiked with	•	529-0000			· ·	imple (T.V.= 0.9 I Water (T.V.=	• •	
$^{\circ}V$		0.2 mi oi. 0.3	ml of	 ,	•		1 water (1.v.= mple (T.V.=0c)	* * *	
as a	Comments:	<u> </u>	<u> </u>			51 561	Lee face, and	P P ***/	
						**************************************	- 1 /	,	
2	Prepared By:					Date/Time:	8/22/1	1 KWIA	00
	Analyzed By:					Data/Time	8/22/	1 (0) 121	· pr

Date:

Reviewed By: \_

40	
10/10/10	524-10061001 25133ppl Stock for 03
	AL CAPTURE
TW	
	EXP: 10/20/10
10/6/10	524-1006/002 25/33/10 Jay/00/ for 0:
4	0.05 ml Pyridine-4-carboxaldehyde TEI
	( <u>IGINC</u> ;Exp: 9/10/12) up to 500 ml w/Dl Water.
	BXP: 10/20/10
1	
	524-1006/003 MBTH SO/M
10/6/10	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> EMO 49784; AF 11/2
	EXP: 10/7/10
	EXP. 10/7/10
15/11/10	Cht routens a le
10/15/10	524-10151001 GOT ICV CON STUCK
	Purchased 100PM Craf
	FICCA Chemical (b) Cut No 2095-16
	500ml Plactic
	10TH 101617
	LOT# 10/0177
	EXP: 3/20/2
10/15/R	524-10151002 500PM NOZ Stock
	- hurchased
; <del>- JOV</del> -	PVA Chimical Co (ut No: 5444 5-4
e*	Rech Chemical Co (ut No: 5444-5-4

1:1H2 1,5-01 pheny Carbohy drazide (EMD 107 47/03) 1/30/13) 7 50 ml W/ACCHORI (AM) LOT \$471540; OXP: 9/24/12 EXP: 3/91/11 534-0228/10/ 0./WH2SOY 5.6 ml and 1-12 Dy (omo 49284 Oxp 11/20/14 524-0228/101 W/DI 470 EXP: 3/28/12 0228/102 1001 mg/ ON67 Ventures CGCR (6) ml Clear Glass D2-CR03040

- Difheny/carboll 8/2011 147020713B; CXP: 10/11/ (CMD 46321715B; EXP: DIOI H20 EXP: 4/17/11 wed And Aprroved By: 534-04141101 iox conc Givent exp 4/29/11 524-04291002 750m1 WIDI HZO.

NH3 FILLING ga 4/26/11 42504 (and 49284; Oxf: 11/2 1:142504 (524-042611 OH

3/20/3 524-04281101 OIN HZSUY 5-Diphenylcarbohydrazide (GTBaty Jose41; W 04 191101 (10 x ums spent: EXP: 9)

	V. ₽
Spiga	594-05191103 ICO2 PCR
- Ja	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM JUSCH)  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: n/20/14). Bring up to volume w/ DI H2O; mix and degas.
	QP: 5/24/11
-5/20/11	524-0520 1101 PH 2,000 BUFFER
- 90V	Purchasa BOH 5010-500 m L
	101# 1101225
	EXP:12/2012
5/30/11	334-0520402 PH 4.000 MIGHER
- Sh	TT Byker CAT # 5657-01 500mL
	10T# J36503
	EXP: 9/30/10
920/11	524-8520403 pt 7.38 BUTTER
Sr.	BDH CAT # BDHS058-500m L
	107# 1103360/
:	[X: 0/20]

Ţ.;	10	
Allendaria Salahari Barana	8bəlu	524-0822/104 Cr6+ Colorine feagle 0.25g 1,5-0ipheny(carbohydrazide (Jikirer; Jos 64, Exp. 6/15/15) I GIN W/ Actor (EMD:
		0,25g 1,5-Dipheny Carbohy drazide (Ji Biker: Jos 64)
		exe. 6/15/15) 9 40 ml N/ Acetone (EMD:
		(0747154D EXP: 9/24/12)
		011:9/20/11
		VII 1/100/11
	8/22/11	524-08221105 1000PM SOZ STOCK
	SV	
		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
-:		80.01-1
-		EXP: 9/5/11
-		
-	8/0/11	524-0822/106 100 pm 503 Ia/ca
		0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
j. ji fil		to 100 ml w/ DI Water.
		EXP: 9/5/4
"	8/23/11	524-08231101 1000 pplo Cr Stock
-	Sh	0/ml 524-02281102 (1001 ppm (r6+; exp: 3/1/12)
·		1 100 ml w/ f/+ ADJUSTED DI (pH=9.426).
		ar: 3/1/12
ا ات.		
	8/23/11	524-0823/102 250pp (Not Ia/Ca)
Monte		0.25 9.3 mL Ref 5.24 + 10 (5,700) (10 exp: 3/2012 up to 100
		mL with pH adjusted (pH= 9.426), degassed DI Water.
		Expi 9/6/1



### 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

me Juderta

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103220

JPL GW Mon 3Q11 / G486090 Project:

### **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.

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: Project ID: Battelle

JPL GW Mon 3Q11 / 100006114

Service Request: P1103220

Date Received: Time Received: 8/24/2011 15:51

			Date	Time	96A
Client Sample ID	Lab Code	Matrix	Collected	Collected	71
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

## Columbia Analytical

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

Page ₫,

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

2655 Park Center Drive, Suite A

(<u>10</u> Project Manager Company Name & Address (Reporting Information)  $\mathcal{B} \text{ \textit{MTE/IE}}$ Email Address for Result Reporting SAN DIEGO, 3990 OID TOWN AVE, CZOS クチンロ 726-7311 Owned Company Services No CONNER 85+ (+1a) Ž U 01126 1199-Sampler Project Name 28868 | BUTTEILE Proje**909006**1/9 P.O. # / Billing Information
285/165/1 / BBMEILE JPLIGH. MON. 3all E 0000849 in & Sign) CHARE BROWN . COLUMBUS 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 04 4320 rganics GC/MS TPH Gas [] 260B ☐ Oxygenates ☐ 8015B [] 21B [] MTBE 8021B [] el 8015B 🖂 (Subcontracted) el Low Level 8015B 🖂 (Subcontracted) tile Organics GC/MS Analysis Method and/or Analytes 270C [ (Subcontracted) V (7196) Preservative Code CAS Projegt No. CAS Contact Preservative Key Other Asc Acid NaOH H2SO4 HNO3 HCL None Zn Acetate

Relinquished by (Signature)	Refinquished by: (Signature)	Tier II · (Results + QC)	Report Tier Levels - please select Tier I - (Results/Default if not specified)						DUPE-02 - 3011	DVRE 1/11		1. +1- MM	MU-14-2	mw-14-3	Client Sample ID
		O Tier V - (ol	-						8/24/))	1 / /		8/24/1	8/z4/	8/24/11	Laboratory Date ID Number Collected
Date:	16.2% C	Tier V - (client specified) _	Tier III - (Data Validation Package) 10% Surcharge.						4			81241 11 1521g	8/24/11 1023	100	Time d Collected
Time: KS	Timeruo		ackage) 10% t						É	Ø		<u></u>		٤	Matrix
Received by (Signature) Received by (Signature)	Received by: (Signature)		Surcharge												Number of Containers Volatile
gnature)	gnature)	MDL / PC	MRL requ												624 (3 826) TPH Gas 8 BTEX 8021 TPH Diesel TPH Diesel
		MDL / PQL / J required Yes / No	MRL required Yes / No						X			X	X	X	TPH FC (C Semi-Volati 625 (1) 827
<i>y</i>		Туре:	EDD requi	 											
Date Time:	2000	-	EDD required Yes / No												
Cooler / Blánk / Ice / No Ice			Project Requir						0	1			LE		
// Ice / No Ice	THE RESERVE THE PARTY PROPERTY OF THE PARTY PROPERTY PROP		Project Requirements (MRLs, QAPP)						DUPLI CATE	DIPHORE C			LEVEL IV QU		Remarks
	<u>L</u>		***************************************	<u>                                     </u>				<u> </u>		5	1		5 of 2	21	

### Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103220

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	

### 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

### **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103220			
Project:	JPL GW Mon	3Q11 / 100006114								
Sample(s	s) received on:	8/24/11			Date opened:	8/24/11	by:	SSTAI	PLES	
Note: This f	form is used for <u>all</u>	samples received by CAS.	The use of this for	rm for custody sea	ls is strictly mea	nt to indicate presence	absence and not	as an indic	cation 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/SOI										BI/A
								Yes	No	<u>N/A</u>
1	_	containers properly	marked with cl	ient sample IL	<b>)</b> ?			$\boxtimes$		
		supplied by CAS?						X		
3	_	ontainers arrive in go						$\overline{\times}$		
4	Were chain-o	<b>f-custody</b> papers used	l and filled out	?				$\square$		
5	Did <b>sample container labels</b> and/or tags agree with custody papers?									
6	Was sample volume received adequate for analysis?									
7	Are samples v	within specified holding	ng times?					$\times$		
8	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Ten	nperature: ° C Blar	nk Temperatur	e: 3° C		Wet 1	ce			
9	Was a <b>trip bl</b>	ank received?								X
10	Were custody	seals on outside of c	ooler/Box?						X	
	·	Location of seal(s)?					Sealing Lid?			X
	Were signatur	re and date included?					8			X
	Were seals in									$\overline{\mathbf{x}}$
		seals on outside of sa	umple containe	r?					X	
	Were custody	Location of seal(s)?					Sealing Lid?			$\boxtimes$
	Wana siamatuu						Seaning Liu!			X
	Were seals in	re and date included?								X
1.1			4.	11	41 1/COD	CI:	c .: 0			
11		rs have appropriate <b>p</b> r		_		Client specified i	niormation?	$\boxtimes$		
		ent indication that the			reservea?					$\boxtimes$
		vials checked for prese								X
	Does the clier	nt/method/SOP require	e that the analy	st check the s	ample pH and	d if necessary alte	r it?			X
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain i	noisture?							X
13	Badges:	Are the badges p	properly cappe	d and intact?						$\times$
		Are dual bed bad	ges separated a	and individual	ly capped and	d intact?				X
I ob 6	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Dansi	pt / Pres	aurotion	
Lab	sample 1D	Description	pH *	pH	pH	(Presence/Absence)		Commei		
P1103220	0.001.01		r	F	F	(				
P1103220		125mL Plastic NP 125mL Plastic NP								
P1103220		125mL Plastic NP								
P1103220		125mL Plastic NP								
P1103220		125mL Plastic NP								
		<u> </u>								
-		ies: (include lab sample								
Sample -00	)5 was not listed	d on the COC.	Information for	r this sample wa	s taken from t	he sample container				

 $RSK - MEEPP, HCL \ (pH\!<\!\!2); RSK - CO2, \ (pH \ 5\text{-}8); \ Sulfur \ (pH\!>\!\!4)$ 

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:

Analysis Method: 7196A

None

Test Notes:

Units: mg/L (ppm)

Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-14-3	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	

Report By:SAnderson

Kam Rya

8 of 21

### QA/QC Report

 Client:
 Battelle
 Service Request:
 P1103220

 Project:
 JPL GW Mon 3Q11 / 100006114
 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: Kam Rya

Date: 8/24///

QA/QC Report

Client: Battelle

**Project:** JPL GW Mon 3Q11 / 100006114

**Service Request:** P1103220 **Date Analyzed:** 08/24/11

Initial and Continuing Calibration Verification (ICV and CCV) Summary

Analyte: Chromium, Hexavalent

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

Title:

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0518	104	90-110
CCVI	0.0500	0.0518	104	90-110
CCV2	0.0500	0.0518	104	90-110

Approved By:

CCV1A/120594

Date

Karu Rya

QA/QC Report

Client: Battelle

JPL GW Mon 3Q11 **Project Name:** 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

P1103220-LCS

Units: mg/L (ppm) Basis: NA

Lab Code:

Test Notes:

						CAS	
						Percent	nt ery ince Result
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	
					·		
Chromium, Hexavalent	None	7196A	0.0400	0.0384	96	90-110	

Kam Rya Date:

Report By:SAnderson

11 of 21

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

Lab Code:

P1103220-001MS

P1103220-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0393	0.0393	79	79	73-119	<1	

Kam Rya

Date:



			pH Run	Log				
Service Reques	st #(s):	$\rho_U$	63220	P1103ZZ	23			
Time: 0910	·							
Sample	V	NR lot#	Exp.	5	Slope		Prep	.Run#
pH 2 Buffer	524-0	520/10/	12/2012	7	, (d)			
pH 4 Buffer		520/100	9/30/12	1/98.	4%		R	un#
pH 7 Buffer		04271102A	3/2013					
pH 10 Buffer		0426102	9/40/12					
pH in liquid: (1) 90	, ,	•				ethod num	ber in column labei	ied # beiow )
pH adjustment:(5) Sample	7196A,(	6) 7199 (Note pH	Temp. °C	Imn labeled :	<del></del>	#	Hq	Temp. °C
pH 2.000		2.009	20.8	Jami	5.0	π	<b>)</b>	
	56		7.0					
pH 4.000	1-1-1	4.006	20.9				<del>/</del>	
pH 7.000		7.030	21.1					
pH 10,000	1/20/1	10,013	21.30			A	/	
Ref#: 924-0520110	3U	7.400	21.5			$\mathcal{L}$		
D.T	5	2.092	20.8			4	<u> </u>	
DI	6	9.440	22.5			1/2		
DH 10,000	56	10.017	21.8		1			
MIC: 165	Do	2/			VI)	Х		
QH 2.000	5	2.009	20.10		1			
PUD 3220-101		2.010	12.70		101			
1-2.01		2.601	126	17				
-3.01		1.800	129		$\uparrow$			
-4.01		1.805	12/00	1				
1 -501		1862	13.20					
011677771		1019	1260					
11 2 MM	+1	7/1/6	70170					
pH Adjustments	· X 710	2.010	Conc H SO	ENA 46281	/EYD:	,,,	20/14	
priAdjustifiertis			NaOH <u>524-04</u>				W[17]	
Comments	,	JA. Dilatoa i	14011 27 04	(3)(V) L/X()		<del>)     </del>		
·								
* Soil or Solid pr	en: 1:1	(wt·val) with	DI water: ** 9	Samples re	ceived	past re	ecommender	t hold time
			ion changed:	1001	1	p 401 10		
Note: ATC probe				- 1	alculation	on is no	ot necessarv	
, , , , , , , , , , , , , , , , , , ,		4	- F = 1 S.13, 0 O			~h	11.	
Analyst	:_/_	OV ,			Date:	SH	1/1/	<b>-</b>
Reviewer	:	WP_	·		Date:	_ 2	55/11	pH.XLS

Analytical Service	es Method EP	A 7196A				
ervice Request#(s): PH03221		Run#:	2	58843		
Stock#: 524-02281103 7.V=1	10fpm EXP: 2/28/12,	Prep Run#:			a h	oher
CV/CCV#: 524-10/5/00/	1.1=100 PPM EXP: 3/2016	→Conc. H <sub>2</sub> SC	04 Lot#: _ EM (	0 49384	EXP:11/20	714
	ă.	Coloring R	eagent Ref#:	24-082211	104 EXP	: 9/20/11
Working Curve:	Prep Dilution	NA -	0.05/50	0.25/50	0.5/50	Corr. Co
	Concentration mg/L	0.00	0.01	0.05	0.1	. 00000
	Absorbance @ 540 nm	0,000	0.010	0.057	0.112	0.99986

				<u> </u>	6/100	0.070		0177	<u></u>
TCB 1 TCN	Sample #	Sample Vol.(mL)	Dilution		Bkg.	Absorbance @ 540nm 0.000	Corrected Abs. (minus bkg.)	Results - mg/L 0.00030 8	QA/QC - %R / RPD 1-0, 1/0 Z <sub>3</sub>
2 MB	<u> </u>			<i>u</i>	0,000	0.000	0,000	0.000308	104%
3 US	0.04PAM		-		0.006	0.043	0.043	0.0384	96%
	220-1,01				0.000		0.000	0.000308	
5 1	-1.01MS 0.09	em	-	,	0.000	0.044	0.044	0.0393	79%)
5	1.01MSD J		-		0.000	0.044	0.044	0.0393	798
	-2.01	. reference	_	لر	0.000	0.000	0.000	0.600308	20.003
-	-2.011/50,03	PM		/ر.	10-000	0.00	0.029	0.0260	87%
	3:01		_	ب	0.000	0.00 D	0.000	0.000308	20,003
	24.01			_/	0.000	0.000	0.000	1	*
V	-6.01				0.000	0.000	0.000		10
ab	0.05F/M				0.000	0.058	0.05 8	0.0518 2.000308	10,003
P1103	223-1.01		<u> </u>	-	0.000	0.000	0.000	J	Vo
	1-1.01 VS 0.03		_	لمر	0.000	0.029	0.029	0.0260	876
	-1.01 MS 0.05	PAN	-	1	0.000	0.045	0.045	0.0402	80%2
\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1 -1.01MSP]				0.000	0-045	0.045	0.040	80% 5 8
Cub	2	W	V	7	0.000	0.000	0.028	0.000308	10.003
	pH Requirement: NV/CCV spiked with 0.0	viethod 71 Smlof	90A (2 ± 6 6747015):	0.5) a)	Samples	инеred prior эН adjusted D	to pH adjustm	ent $r = 0.05  \text{npm}$	

ICV/CCV spiked with 0.05 ml of 9.05 ml of pH adjusted DI WATER (T.V.= 0.05 ppm) MS/MSD spiked with 0.05 ml of 5211-0728103  $\uparrow$  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  $\uparrow$  10 ml of sample (T.V.= 0.09ppm) Comments:

Prepared By: Analyzed By: Reviewed By:

Date/Time: Date/Time:

Date:

Cr6LIQ.xls

. 40	
10/16/10	524-1006/001 25/33ppl Stock for 03
	\$2.05 ml Pyridine-4-carboxaldehyde Alfa Aesaw
JV-	10/46598; Exp: 8/11/p) up to 500 ml w/ DI Water.
	EXP: 10/20/10
10/6/10	524-1006/002 25/33/1/2 Jay/CV for 0:
- SV	0.05 ml Pyridine-4-carboxaldehyde TCI
	( <u>IGINO</u> ;Exp: 9/10//2) up to 500 ml w/Dl Water.
	EXP: 10/20/10
i	
1/2	524-1006/003 MBTH 50/17
10/6/10	0.5000 a MRTH (Aldrigh SHIGGLEV From 8/7/14)
50/	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44784; CX 1/2
	EXP: 10/7/10
: ·	
10/15/10	524-10151001 (NOT ICV/CON Starle
	Purchased 100PPM Cr6+
	FICCA Chemical Co Cyt No 2095-16
	500ml Plastic
ı	LOT# 10/0177
	LOT# 10/0177 EXP: 3/20/2
10/15/10	524-10151002 500PM NOZ Stock
	MIKARSED
, - Oov	RICH Chemical a lut No: 5444-5-4
v-	RCA Chemical Co (ut No: 5444-5-4 LOT+ 1010271 120 ml amber 9/45

524-0221101 1:1H250 LOT#47154D; EXP: 9/34/12). EXP: 3/21/11 0.1NH2504 524-0228/101 5.6 ml Come 1/2 Dy (OMD 49284 BXP 111/20/14) W/DI 470 EXP: 3/28/12 -0228/102 1001 mg/2 ON67 Ventures CGCR (6)1-Inorganic Glass 125 ml alar D2-CR03040 DXP: 3/1/2012

(CMD 46301715B W10I H20 EXP: 4/17/11 \_ Date:3/8/1 524-04141101 524-04291002 (iox Conc Cluent; exp 4/29/11 4/28/

NH3 FILLING 94/20/11 42804 (and 49284; Oxf: 11/20, NN-Pinetly 1:1 H2504 (524-0426/104;

	O.E.
Syl	SAY-05791103 ICO2 PCR
10	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (Ext. 30564)
1/61	exp: 6/18/15) in 100 mL Methanol (B&J AD806 exp: 2-1/2/11)
	Add to 1 L volumetric flask containing 500 ml. DI water +
-	5.6 mL conc. H2SO4 (EMD 49184 exp: 11/20/14). Bring up to volume w/DI H2O; mix and degas.
	QP: 5/24/11
1	
5/20/11	524-0520 1101 PH 2,000 BUPFER
90/	purchasa)
- 00	BOH CAT. No. BOH 5010-500 ML
Management of the state of the	101# 1101225
Security of Property of Security State State Security Sec	EXP:12/2012
The state of the s	
- halis	334-05201102 pH 4.000 BURGER
7/20/1	
M	furchasel
	JT Buker CAT # 5657-01 500mC
	10T# J36503
	EXP: 9/30/10
Amil	SOIL A ENDIINZ OF 7.38 BUSTER
7/241	Day of the first of the state o
	furchased
	BDIT CAT # BDHS058-500mL
	LOT# 1103360/
_	DX: 3/2013
and the vertical and th	
BC .	•

	70	
	sbalu	524-0822/104 Cr6+ Coloring feagle 0,25g 1,5-0; pheny (carbohy drazide (Jikyker; Jos 64, exp. 6/15/15) 9 50 NV N/ Actor (EMD.
		0,25g 1,5-0ipheny/carbohydrazide (JThyrer: Jos 64)
		exe. 6/15/15) 9 50 ml W/ Acetone (EMD)
		COT 47154D EXP: 9/24/12)
		EXP: 9/22/11
P	_	
	8/22/11	524-08221105 1000PM Soz stock
4		Q d 591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
-		1 00 ml w/ Dl Water.
-		EXP: 9/5/11
		214 . 1/9/11
-	8/2/11	524-08221106 100 pm 503 Ia/ca
	- W	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
2" -	and the second s	EXP: 9/5/4
-		VIVI - 17 3 7 4
	8/22/11	524-08221101 1000 anh ( 6+ Stock
	0/00/11	0/ml 524-0228/102 (100/ppm(rbt; exp: 3/1/12)
-		1 10000 101 0H ADTICTED DT (114-9420)
) to 1		12010 af filmsvsnip at (fil-1116).
F		V4. 5/1/10
-	8/23/11	534-0823/102 250pb Orbt Ia/Ca
		0.25 0.3 mL Ref 5.24 + 101 5 7 01 (1) 10 exp: 3/2012 up to 100
***	0	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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

ne Juderta

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103223

JP-GW-3Q11 / 100006114 Project:

# **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.



P1103223-001

Water

8/24/2011

MW-8

DETAIL SUMMARY REPORT Client: Battelle Service Request: P1103223 Project ID: JPL-GW-3Q11 / 100006114 Date Received: 8/24/2011 Time Received: 15:51 Date Time Client Sample ID Lab Code Matrix Collected Collected

10:45

# Columbia Analytical Services, Inc.

## Acronyms

CA LUFT California DHS LUFT Method

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

CFC Chlorofluorocarbon

CRDL Contract Required Detection Limit
DLCS Duplicate Laboratory Control Sample

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

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

# Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# An Employee - Owned Company Columbia Analytical

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

Page <u>o</u>,

Services\*\*

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

2655 Park Center Drive, Suite A Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) (10 Day - Standard) Analysis Method and/or Analytes CAS Contact: CAS Project No

Company Name & Address (Reporting Information) Battelle Sos King five Columbus OH 43201	rmation) Project Name  301  Project Number  1000 6114  P.O. # / Billing Information	d Gas 🗆	bcontracted)	Preservative Code		Preservative Key  0 None 1 HCL 2 HNO3 3 H2SO4
Phone Fax  in 19726-7311 614 458- Email Address for Result Reporting  Connect (a), bath 16 ~~	Sampler (Print & Sign)	ganics GC/MS 508 (i) Oxygenates (i) T 5015B (i) 1B (i) MTBE 8021B (i)	I 8015B □ (Subcontrace I Low Level 8015B □ (Subcontracte I 8015M (Subcontracte Ide Organics GC/MS 70C □ (Subcontracted)			7 65 57
Cilent Sample ID Laboratory ID Number	Date Time Matrix	624 □ 82 TPH Gas BTEX 802	TPH Diese TPH FC   Semi-Vola 625 [] 82	11026		Remarks
S-UM	824/1 1045 AG	<i>(A)</i>	X			
Report Tier Levels - please select Tier I - (Results/Default if not specified)	Tier III - (Data Validation Package) 10%					Project Requirements (MRLs, QAPP)
Tier II - (Results + QC)	Tier V - (client specified)		MRL required Yes / No MRL PQL / J required Yes / No	EDD required Yes / No Type:	Yes No	

Relinquished by, (Signa Relinquished by: (S)

200 000

Received by: (Sign

Received by: (S)ginature) Received by: (Signatt

The Co

Temperature \_\_\_

ကိ

Cooley/ Blank / Ice / No Ice

1 2 Exercises

# Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103223

JPL-GW-3Q11/100006114 Project:

<b>Bottle ID</b>	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	

# 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

# **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103223	02-000		
•		1 / 100006114								
•	s) received on:			•	Date opened:		by:	SSTAI		
		samples received by CAS.			-	_			cation of	
compliance	or nonconformity.	Thermal preservation and p	H will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/	SOP. <u><b>Yes</b></u>	<u>No</u>	N/A
1	Were sample	containers properly r	narked with cl	ient sample ID	<b>)</b> ?			X		
2	_	supplied by CAS?						×		
3		<b>ontainers</b> arrive in go	od condition?					X		
4	_	<b>f-custody</b> papers used		?				X		
5		ontainer labels and/o			pers?			X		
6		v <b>olume</b> received adequ						X		
7	Are samples v	within specified holding	g times?					X		
8	Was proper to	<b>emperature</b> (thermal <sub>j</sub>	oreservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Ten	nperature: ° C Blan	k Temperature	e: 3° C		Wet	Ice			
9	Was a trip bla	ank received?								X
10	Were custody	seals on outside of co	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	re and date included?								X
	Were seals int	tact?								X
	Were custody	seals on outside of sa	_						X	
	Location of seal(s)? Sealing Lid?									X
	Were signature and date included?									$\overline{\times}$
	Were seals int									$\overline{\times}$
11		rs have appropriate <b>pr</b> ent indication that the s		•		Client specified i	nformation?	$oxed{oxtimes}$		
		rials checked for prese								×
		nt/method/SOP require			ample nH and	d if necessary alte	or it?			X
12	Tubes:	Are the tubes cap	•		ampie pri and	a <u>ii necessary</u> and	A 11.			X
12	14005	Do they contain n	_	•						X
13	Badges:	Are the badges p		d and intact?						X
13	Dauges.	Are dual bed bads			ly canned and	l intact?		П		$\boxtimes$
	a		1				5 4	/ 5		
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		ot / Prese Comme		
P1103223	R-001 01	125mL Plastic NP	-	•						
Explair	any discrepanc	ies: (include lab sample	ID numbers):							
-	_	_								

 $RSK - MEEPP, HCL \ (pH\!<\!\!2); RSK - CO2, \ (pH \ 5\text{-}8); \ Sulfur \ (pH\!>\!\!4)$ 

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 Method Blank	P1103223-001 P1103223-MB	0.010 0.010	0.003 0.003	1	NA NA	08/24/11 17:25 08/24/11 17:25	ND ND	

Approved By

Kam Rya

Date

1/29/11

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 CCB1	0.010 0.010	0.003 0.003	ND ND
CCB2	0.010	0.003	ND

Approved By:

ICCBMDL/120594

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
CCVI	0.0500	0.0518	104	90-110
CCV2	0.0500	0.0518	104	90-110

Approved E

CCV1A/120594

Data

Karu Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL-GW-3Q11

**Project Number:** Sample Matrix:

100006114 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

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0384	96	90-110	

Report By:SAnderson

Kam Rya

11 of 21

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL-GW-3Q11

Sample Matrix:

Project Number: 100006114

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

P1103223-001MS

P1103223-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0402	0.0402	80	80	73-119	<1	

Kam Rya



			pH Run	Log				
Service Reques	st #(s):	$\rho_{U}$	63220	P1103ZZ	23			
Time: 0910	·							
Sample	V	NR lot#	Exp.	5	Slope		Prep	.Run#
pH 2 Buffer	524-0	520/10/	12/2012	7	, (d)			
pH 4 Buffer		520/100	9/30/12	1/98.	4%		R	un#
pH 7 Buffer		04271102A	3/2013					
pH 10 Buffer		0426102	9/40/12					
pH in liquid: (1) 90	, ,	•				ethod num	ber in column labei	ied # beiow )
pH adjustment:(5) Sample	7196A,(	6) 7199 (Note pH	Temp. °C	Imn labeled :	<del></del>	#	Hq	Temp. °C
pH 2.000		2.009	20.8	Jami	5.0	π	, pr.	
	56		7.0					
pH 4.000	1-1-1	4.006	20.9				<del>/</del>	
pH 7.000		7.030	21.1					
pH 10,000	1/20/1	10,013	21.30			A	/	
Ref#: 924-0520110	3U	7.400	21.5			$\mathcal{L}$		
D.T	5	2.092	20.8			4	<u> </u>	
DI	6	9.440	22.5			1/2		
DH 10,000	56	10.017	21.8		1			
MIC: 165	Do	2/			VI)	Х		
QH 2.000	5	2.009	20.10		1			
PUD 3220-101		2.010	12.70		101			
1-2.01		2.601	126	17				
-3.01		1.800	129		$\wedge$			
-4.01		1.805	12/00	1				
1 -501		1862	13.20					
011677771		1019	1260					
11 2 MM	+1	7/1/6	70170					
pH Adjustments	· X 710	2.010	Conc H SO	ENA 46281	/EYD:	,,,	20/14	
priAdjustifiertis			NaOH <u>524-04</u>				W[17]	
Comments	,	JA. Dilatoa i	14011 27 04	(3)(V) L/X()		<del>)     </del>		
·								
* Soil or Solid pr	en: 1:1	(wt·val) with	DI water: ** 9	Samples re	ceived	past re	ecommender	t hold time
			ion changed:	1001	1	p 401 10		
Note: ATC probe				- 1	alculation	on is no	ot necessarv	
, , , , , , , , , , , , , , , , , , ,		7	- F = 1 S.13, 0 O			~h	11.	
Analyst	:_/_	<i>Ф</i> У ,			Date:	SH	1/1/	<b>-</b>
Reviewer	:	WP_	·		Date:	_ 2	55/11	pH.XLS

	malytical set vice	S Method EP	A /190A				-
ervice Re	equest#(s): <u>PH032ZC</u>		Run#:	2	58843		
tock#:_ <u>5</u>	24-02-281103 7.1-10	PPM EXP: 2/28/12	Prep Run#			1 h	Blue
CV/CCV	#: 524-10151001 T.	1=100 PM BXP: 3/2010	→Conc. H <sub>2</sub> Se	O4 Lot#:	D 49384	EXP:11/20	11/4
			Coloring R	teagent Ref#:	24-082211	104 EXP	: 9/23/11
	Working Curve:	Prep Dilution	NA NA	0.05/50	0.25/50	0.5/50	Corr. Co
		Concentration mg/L	0.00	0.01	0.05	0.1	1.00000

Abso	rbance @, 540	nm	0,000	0.010	0.057	0.110	0,77786754
		167	:		Corrected		
	- 1	/ ~/		Absorbance		Results -	QA/QC - %R
							/ RPD
SPPM !		- L	0,000	0.058	0.058	0.000308	1047
		<i>-</i>	0,000	0-000	0.000	0.000308	10.103
4PM			0.006	0.043	0.043	0.0384	96%
))			0.000	0.000	0.000	0.000308	60,003
11MS O.OSPPM			0.000	0.044	0.044	0.0393	79%)
DIMSD J	_		0.000	0.044	0.044	0.0393	7995
01	T. CONTROLL OF THE PROPERTY OF		0.000	0.000	0.000	0.60030S	20.003
011/S 0,03/PM	_		0.000	0.029	0.029	0.0260	87%
.01	_	ب ا	0.000	0.00 D	0.000	0.000308	20,003
	-		0.000	0.000	0.000		
6.01				0.000	0.000		10
0.05///			0,000	0.058	0.058	0.0518 D.000308	10,003
01	_			0.000	0.000	1	Vo
21 VS 0.03 PPM	_	4	0.000	0.029	0.029	0.0260	876
01 MS 0,05PM			0.000	0.045	0.045	0.0402	80%7
DIMSPT	_		0.000	0-045	0.045	0.040	80% }
	<del></del>		0:100	11,000	0.028		
	Sa: Vol SPPM 04PM 01MSD J 01MSD J	Sample Vol.(mL) Diluti SAPM	Sample Vol.(mI) Dilution  SPAM  OUPPM  OINSO J   Sample Vol.(mI) Dilution Bkg.  SppM - 0.000  0.000	Sample Vol.(mI) Dilution Bkg. @ 540nm	Sample Vol.(mI) Dilution Bkg. @ 540nm (minus bkg.)  5PPM - 0.000 0.000 0.000  0.000 0.000 0.000	Sample Vol.(mL1) Dilution Bkg.	

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment ICV/CCV spiked with 6.15 ml of 6.14 1015100 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm) MS/MSD spiked with 0.05 ml of 5211-07281103  $\uparrow$  10 ml of pH adjusted sample (T.V.= 0.05 ppm) ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm) LCS spiked with 0.2 ml of Verification Standard Spiked 0.7 ml of  $\uparrow$  10 ml of sample (T.V.= <u>0.09ppm</u>)

Comments:		*		
Prepared By:		Date/Time:	8/24/11 (N/7/0)	
Analyzed By:	$\mathcal{V}_{\underline{\hspace{1cm}}}$	Date/Time:	8 124/11 100 1725	

Reviewed By:

Date:

. 40	
10/16/10	524-1006/001 25/33ppl Stock for 03
	\$2.05 ml Pyridine-4-carboxaldehyde Alfa Aesaw
JV-	10/46598; Exp: 8/11/p) up to 500 ml w/ DI Water.
	EXP: 10/20/10
10/6/10	524-1006/002 25/33/1/2 Jay/CV for 0:
- SV	0.05 ml Pyridine-4-carboxaldehyde TCI
	( <u>IGINO</u> ;Exp: 9/10//2) up to 500 ml w/Dl Water.
	EXP: 10/20/10
i	
1/2	524-1006/003 MBTH 50/17
10/6/10	0.5000 a MRTH (Aldrigh SHIGGLEV From 8/7/14)
50/	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44784; CX 1/2
	EXP: 10/7/10
: ·	
10/15/10	524-10151001 (NOT ICV/CON Starle
	Purchased 100PPM Cr6+
	FICCA Chemical Co Cyt No 2095-16
	500ml Plastic
ı	LOT# 10/0177
	LOT# 10/0177 EXP: 3/20/2
10/15/10	524-10151002 500PM NOZ Stock
	MIKARSED
, - Oov	RICH Chemical a lut No: 5444-5-4
v-	RCA Chemical Co (ut No: 5444-5-4 LOT+ 1010271 120 ml amber 9/45

524-0221101 1:1H250 LOT#47154D; EXP: 9/34/12). EXP: 3/21/11 0.1NH2504 524-0228/101 5.6 ml Come 1/2 Dy (OMD 49284 BXP 111/20/14) W/DI 470 EXP: 3/28/12 -0228/102 1001 mg/2 ON67 Ventures CGCR (6)1-Inorganic Glass 125 ml alar D2-CR03040 DXP: 3/1/2012

(CMD 46301715B W10I H20 EXP: 4/17/11 \_ Date:3/8/1 524-04141101 524-04291002 (iox Conc Cluent; exp 4/29/11 4/28/

NH3 FILLING 94/20/11 42804 (and 49284; Oxf: 11/20, NN-Pinetly 1:1 H2504 (524-0426/104;

	O.E.
Syl	SAY-05791103 ICO2 PCR
10	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (Ext. 30564)
1/61	exp: 6/18/15) in 100 mL Methanol (B&J AD806 exp: 2-1/2/11)
	Add to 1 L volumetric flask containing 500 ml. DI water +
-	5.6 mL conc. H2SO4 (EMD 49184 exp: 11/20/14). Bring up to volume w/DI H2O; mix and degas.
	QP: 5/24/11
1	
5/20/11	524-0520 1101 PH 2,000 BUPFER
90/	purchasa)
- 00	BOH CAT. No. BOH 5010-500 ML
Management of the state of the	101# 1101225
Security of Property of Security State State Security Sec	EXP:12/2012
The state of the s	
- halis	334-05201102 pH 4.000 BURGER
7/20/1	
M	furchasel
	JT Buker CAT # 5657-01 500mC
	10T# J36503
	EXP: 9/30/10
Amil	SOIL A ENDIINZ OF 7.38 BUSTER
7/2411	Day of the first of the state o
	furchased
	BDIT CAT # BDHS058-500mL
	LOT# 1103360/
_	DX: 3/2013
and the vertical and th	
1	
BC .	•

	70	
	sbalu	524-0822/104 Cr6+ Coloring feagle 0,25g 1,5-0; pheny (carbohy drazide (Jikyker; Jos 64, exp. 6/15/15) 9 50 NV N/ Actor (EMD.
		0,25g 1,5-0ipheny/carbohydrazide (JThyrer: Jos 64)
		exe. 6/15/15) 9 50 ml W/ Acetone (EMD)
		COT 47154D EXP: 9/24/12)
		EXP: 9/22/11
P	_	
	8/22/11	524-08221105 1000PM Soz stock
4		Q d 591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
-		1 00 ml w/ Dl Water.
-		EXP: 9/5/11
		214 . 1/9/11
-	8/2/11	524-08221106 100 pm 503 Ia/ca
	- W	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
2" -	and the second s	EXP: 9/5/4
-		VIVI - 17 3 7 4
	8/22/11	524-08221101 1000 anh ( 6+ Stock
	0/00/11	0/ml 524-0228/102 (100/ppm(rbt; exp: 3/1/12)
-		1 10000 101 0H ADTICTED DT (114-9420)
) to 1		12010 af filmsvsnip at (fil-1116).
F		V4. 5/1/10
-	8/23/11	534-0823/102 250pb Orbt Ia/Ca
		0.25 0.3 mL Ref 5.24 + 101 5 7 01 (1) 10 exp: 3/2012 up to 100
***	0	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 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson Project Manager



Client: Battelle CAS Project No: P1103244

JP-GW-3Q11 / 100006114 Project:

# **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

Date Received: Time Received: 8/25/2011 15:44

Service Request: P1103244

(
,

			Date	Time	864
Client Sample ID	Lab Code	Matrix	Collected	Collected	71
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
					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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

# Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# Columbia Analytical Services \*\*\*

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

Page \_\_\_\_of \_\_

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

 Owned Company Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard Analysis Method and/or Analytes CAS Contact: CAS Project No.

	Relinquished by: (Signature)	Report Tier Levels - please select  Tier II - (Results/Default if not specified) Tier III - (Data Validation Tier II - (Client specified) Tier V - (client specified)							10-10   85/113	11 /55 S-01	10-13   KS/108	Client Sample ID Laboratory Date T	Email Address for Hesult Heporting Sampler (Print & Sign.	311 1014-482-4	Fax S	Project Manager	OM 43201		J ♥ '} ' ( ) '
25/ Time   July Rosalvod by	5-11 Time: 14-30	n Package) 10% Surcharge							11 84 658	00 AQ 10	1843   A.Q   110	Time Matrix Number of Collected Containers	ocoa Musto	lumberS OH 43201	SKISS AND SAME	P.O. # / Billing Information	DODO 6114	J Oder Saliber	
(Signature)	(Signatura)	MRL required Yes / No MDL / PQL / J required Yes / No							X	X	<u>X</u>	624 □ 6 TPH Gas BTEX 80 TPH Die: TPH FC Semi-Vol 625 □ 6	Organics C 2608   C 8 8015B   M 21B   M Sel 8015B Sel Low Lo C   8015M atile Orga 2270C   (	oxygena ITBE 8 □ (Sul evel 80 I (Subc nics G Subcor	021B contra 15B :: contrac	acted) (Subo cted)			()
Date of Mines of Co.	Day 25 Times 430	EDD required Yes) No																	
Temperature // No Ice		Project Requirements (MRLs, QAPP)				·						Remarks		7	<b>o</b> (	4 rc	ω Α	3	

# Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

# Columbia Analytical Services, Inc.

Client: Battelle Service Request: P1103244

JPL-GW-3Q11/10000614 Project:

<b>Bottle ID</b>	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	

# 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

# **Sample Acceptance Check Form**

Client:						Work order:	P1103244				
		11 / 10000614		-	D . 1	0/07/11	,	CCTLAT	N. F.C		
	s) received on		EI 6.1. 6	•	Date opened:		by:	SSTAF			
		samples received by CAS. Thermal preservation and p		-	-	_			cation of		
эшриансе (	or noncomorning.	. Thermal preservation and p	in will only be ev	aruateu etiller at ti	ie request or the	chent and/or as require	d by the method/s	Yes	<u>No</u>	N/A	
1	Were sample	containers properly n	narked with cl	ient sample ID	)?			X			
2	Container(s)	supplied by CAS?						X			
3	Did sample o	containers arrive in go	od condition?					X			
4	Were chain-o	of-custody papers used	and filled out	?				X			
5	Did sample o	container labels and/or	tags agree wi	ith custody pap	pers?			X			
6	Was sample volume received adequate for analysis?										
7	Are samples	within specified holdin	g times?					X			
8	X										
	Cooler Ter	mperature: ° C Blan	k Temperature	e: 2° C		Wet 1	ce				
9	Was a trip bl	lank received?								X	
10	Were custody	y seals on outside of co	ooler/Box?						X		
		Location of seal(s)?					Sealing Lid?			X	
	_	re and date included?								X	
	Were seals in									×	
	Were custody	y seals on outside of sa	_						×		
		Location of seal(s)?					Sealing Lid?			$\boxtimes$	
	Were signature and date included?										
	Were seals in					~				$\boxtimes$	
11		ers have appropriate <b>pr</b> ent indication that the s		•		Client specified i	nformation?	$\boxtimes$			
		vials checked for prese	•		reserved.					$\boxtimes$	
		nt/method/SOP require			ampla pU and	d if nacassamy alta	r it?			X	
12	Tubes:	Are the tubes cap	•		ampie pri and	i <u>ii necessary</u> and	1 11.			$\boxtimes$	
12	Tubes.	1	-	•						$\boxtimes$	
13	Badges:	Do they contain n  Are the badges p		d and intact?						$\boxtimes$	
13	Dauges.	Are dual bed badg			ly canned and	lintact?				$\boxtimes$	
Lab S	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		ot / Prese Commer		l	
1103244	001.01		pm	pii	pii	(Teschee/Ausence)			165		
1103244		125mL Plastic NP 125mL Plastic NP									
1103211		125mL Plastic NP									
Б 1.	1"		ID1		<u> </u>	1					
Expiain	any discrepand	cies: (include lab sample	in inningers):								

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	

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

J

Kam Rya

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

ICCBMDL/120594

Date: 8/29/11

9 of 22

Karu Rya

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
CCVI	0.0500	0.0512	102	90-110
CCV2	0.0500	0.0512	102	90-110

Approved By:

CCV1A/120594

Date: 8/29/11

Kau Rya

QA/QC Report

Client: Battelle **Service Request:** P1103244 JPL-GW-3Q11 **Date Collected: Project Name:** NA

Project Number: 10000614 Date Received: NA Sample Matrix: WATER Date Extracted: NA

Date Analyzed: 08/25/11

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm) Lab Code: P1103244-LCS

Basis: NA

Test Notes:

CAS Percent Recovery Analysis Acceptance Prep Percent Result Method Method Limits Analyte True Value Result Recovery Notes 7196A 0.0400 Chromium, Hexavalent None 0.0404 101 90-110

Report By:SAnderson

Kam Rya

11 of 22

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

P1103244-001MS

P1103244-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.01	0.0500	0.0500	0.0056	0.0467	0.0476	82	84	73-119	2	J

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

J

Kam Ryan



			pH Run		og			,
Service Reques	t #(s):	P110	3244		P110324'	<u>S</u>		
Time: りお4								
Sample	V	WR lot#	Exp.		Slope		Prep.	Run#
pH 2 Buffer	324-	05201101	12/20/2		7	-	- Angel	
pH 4 Buffer		-05201102	9/30/12		498,00	6	Ru	ın#
pH 7 Buffer		04271102A	3/2013		$\left( \right) $	_	**************************************	P 1000P4 EPINOTI
pH 10 Buffer		04261102	9/30/10					
pH in liquid: (1) 904		,				ethod num	ber in column labele	ed # below )
pH adjustment:(5) Sample	/196A,(	(6) 7199 (Note)	Temp. <sup>6</sup> C	um	Sample	#	На	Temp. <sup>6</sup> C
pH 2.000		1. GG(	20,2		P1103245-6.0		1.869	14,40
	5	11017	70.9		11109093 6.0	1-5	1.785	11170
pH 4.000		7.009	310				,	2/00
pH 7.000			2100		PH 2.000	/	2,022	110
pH 10.000	7.2	10.015	21.00		P1103245-80		1,917	16./
Ref#: 524-0520110	*1	7.400	21.50		PHD.000	<u> </u>	2.000	2/17
DÍ		2.049	21.3°		/			
pH 2.000	1	1.993	20.2°					
MME: 16:	50 .	8		ā	1000			
pH 2.000	5	2.013	22.0°		\(\frac{1}{2}\)			
PH03244-1.01	Ì	2.019	/3,3°		A company of the comp		Ŷ	A PARTIE AND
7-2.01		1.807	D.90		, ,	e l	LINA	
V -301		1871	13.30		\ /	- NUU	JW	and the second
A103245-1.01	operation of the last of the l	1.977	12.50			A R	, and	and the second
==2.0/		1.823	13,10			-		11.00
-3.01		1.801	1390					A Commission of the
1-401	100	1,79/	14.10		and the state of t			A CONTRACTOR OF THE CONTRACTOR
11 - 501	W	2.086	1390	24. 24. 24.				
pH Adjustments:	719		Conc H <sub>2</sub> SO <sub>4</sub> ,	Bu	144284 EXP:	11/	20/14	
. ,			VaOH			7	<del></del>	
Comments:								
* Soil or Solid pre	ep: 1:1	(wt:vol) with	DI water: ** S	Sai	mples received	past re	ecommended	hold time.
					5/22/11	,		
Note: ATC probe						on is n	ot necessary.	
·	(	7	•			-	12-1:	
Analyst:	<del>//</del> -	DI		-	Date:	8,	125/11	
Reviewer:		KK			Date:	8/0	26/11	pH.XLS
		•				/	,	

## Hexavalent Chromium (Liquids)

Columbia
Analytical Services

ے Analytical Service	S <sup>™</sup> Method EP	A 7196A			~	90
Service Request#(s): P110324	4 81103245	Run#:	25109	32		
Stock#: 524-0228/103 T.V=/0	MM AP: 2/28/12	Prep Run#:			in a who	/
CV/CCV#: 524-1015/00/ T.V	= 100 fpm ONP. 3/2016	2 Conc. H2SC	Lot#: EM	0 49284	EXP; 11/00/	14
	- J/* · ·	Coloring R	eagent Ref#:5	34-08331	104 EXI	9/11
Working Curve:	Prep Dilution	N.A.	0.05/50	0.25/50	0.5/50	Corr. Coeff
	Concentration mg/L	0.00	0.01	0.05	0.1	

l		Absorbance	: (å; 540 nm		0,000	0.011	0.055	0.112	0.9977 769 9
White street and the street st	Sample #	Sample Vol.(mL)	Dilution		Bkg.	Absorbance	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
	Ich	10m/			0.000	0,000	0,000	0.00045	20.003
<u>'                                    </u>	ICV 0.05PPM	197		V	0.000	0,058	0.058	0.0521	104%
3	Mb		_		0.000	0,000	0.000	0.00245	1
4	165 O. OHAM			٠	0000	0.045	0.045	0.0404	
5	f1103244-1.01		_		0,000	0.006	0,006	0.00561	5202
, 6	1-1.01 MG 0:0	-en	and distribution in the same of the same o	1	0,000	0.052	0.052	0.0467	8293
7	-1.01 MSD J		-	-	0.000		0.053	0,0476	84%
8	-2.0/			4	0,000	0,000	0.000	0.000245	20,003
9	-20/VSa0	PPM		1	0,000	0.029	0,029	0.6262	879
10	V -3.01			/	0.001	0,00	0.001	0.00/14	10.003
111	P1103245-1.01			-	0.003	0.004	0.001	0.00114	10.003
12	J -1.01 VS 1.0	Blin			0.003	0.033	-1.0.099	0.0262	876/
13	CiV/ 0.05//m		parameteris.		0,00	0.057	0.057	0.0512	102%
4	CCB1				0.000	0.000	0.000	0.000245	120.003
15	P1103245-2,01				0.005	0.006	0.001	0.00114	10.003
6	T-2.0/MS	au PAM		1	0.005	0.053	0.048	0.0431	86% 7
17	U -2.0/ MSD	$\sqrt{}$	Ü	-	0.003	0.053	0.048	0.0431	86% (\$
	pH Requirement: 1 ICV/CCV spiked with 6.	Method 719	96A (2 ± 0 sz.J-Inisibil	9.5) 7 0167	Samples 50 ml of a		to pH adjustm	ent .= 0,05 ppm)	H
	MS/MSD spiked with	0.05 ml of	524-021811	<i>t2</i> 1	10 ml of p		mple (T.V.= $0.0$		
V	LCS spiked with erification Standard Spiked	h $0.2 \text{ ml of}$ $\mathcal{C}^{\dagger}, \mathcal{Z}$	ml of	+			I Water (T.V.= nple (T.V.= 0.	1 A .	
	Comments:		III O	<i>V</i>		10 mi 01 341	ирк (т. т. – <u>е</u> л.	ppm,	
	$Q_{\lambda}$					D (TD)	ohelu	(a) dath	
	Prepared By: Analyzed By:					Date/Time: Date/Time:	\$125111	(W 1705	
	Reviewed By:	<del></del>				Date:	8/26/	11	
							, ,		

	C Columbia		Hexaval	ient	Chromiui	n (Liquids)		May	01
4	(2) Analytical Service	_	ethod E	PA	7196A	- 42	12		91
e	rvice Request#(s): 110324		3245	- <b>7</b>	Run#:	2590			
Sto	ock#: <u>594-6228/1067.V-</u> VICCV#: <u>694-10/5/00/</u> 7.1	<u>OSPM EN</u> Ez SABAR	19910 1987 -	d Zha	Prep Run#:	Latti PN	10 46284	DIE: 11/201	14
	V/CCV#: 93% 10/5/001 //	100377	a carry	(Hi)	Coloring R	eagent Ref#:	524-0832	ONF: 11/201	9/2/11
	Working Curve:	$P_{r}$	ep Dilution		N.A	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Sec. Sec. 18		Concents Absorbance	ration mg/L		0.00	0.01	0.05	0.1	0.9995640
7		Absorbance	. ( <u>u</u> , 540 mm		0.000	0.077	0.055	0.112	
North Seal			\e_				Corrected		
I		10- 1.	\'`	. /			A bc		
	Sample #	Sample Vol.(mL)	Dilution	<u> </u>	Bkg.	Absorbance @ 540nm	Abs. (minus bkg.)	Results - _mg/L	QA/QC - %R / RPD
1	Sample # P/103945 - 3,01		Dilution		Bkg.			Results - mgA 20,003	1 -
1		Vol.(mL)	Dilution		7.	@: 540nm	(minus bkg.)	mg/L	/ RPD
1 2 3	P1103945-3.01	Vol.(mL)	Dilution		0.000	@ 540nm O. WO	(minus bkg.)	20,003	/ RPD
1 2 3	P1103245-3.01	Vol.(mL)	Dilution		0.000	@ 540nm O. WO O.OO/	(minus bkg.)  0,000	20,003 0.000245	/ RPD 40,003

0.000

0.000

0,000

0.000

MRL CHECK O.DIPPM

Reviewed By: \_

0.000

0.010 0.00918

0.0512

0.000245

0.000

0.010

0.000

pH Requirement: Method 7196A (2 ± 0.5) F Samples filtered prior to pH adjustment ICV/CCV spiked with 0.25 ml of  $524 \cdot 1015100$  50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm) MS/MSD spiked with 0.05 ml of  $\frac{224}{0228}$   $\frac{228}{103}$   $\frac{2}{10}$  ml of pH adjusted sample (T.V.= 0.05 ppm) 1 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm) LCS spiked with 0.2 ml of \_\_\_\_\_ Verification Standard Spiked ml of  $\uparrow$  10 ml of sample (T.V.= 0 # 3 ppm) (),ろ Comments: Prepared By: Date/Time: Analyzed By: Date/Time:

Date:

40	
10/16/10	524-10061001 25133ppl Stock for 03
	P.05 ml Pyridine-4-carboxaldehydc Alfa Aesur
	10/46598 ;Exp: 8/11/p) up to 500 ml w/DI Water.
1	EXP: 10/20/10
- // /	2011 - 2012 20 - don't 0
10/6/10	524-10061002 25133996 Jalley for 0:
- SV	0.05 ml Pyridine-4-carboxaldehyde TEI
	(
1	EXP: 10/20/10
	524-1006/003 MBTH SO/M
inthatin	534-1006/003 MBTH 50/17
10/04/0	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> EMO 49784; CN 11/2
	EXP: 10/7/10
10115110	524-10151001 (Not ICV/COV Stock
	Purchased 100PPM Cr6+
100	RICCA Chemical (D) Cut No 2095-16
AND A TO THE PARTY OF THE PARTY	500ml Plastic
<u> </u>	
	LOT# 10/0177 EXP: 3/20/2
	EXT (3/30/3
10/11	1011 1010 10 10 10 10 10 10 10 10 10 10
10/15/10	524-10151002 500PM NOZ Stock
	Purchas Cd
, -000	RCCA Chemical a lut No: 5444.5-4
V	RCA Chemical Co Cut No: 5444.54 LOTE 1010271 120 ml amber 9/45
	Volume of the control

04 524-0221101 1:142504 4 (BND 49284; AP: 11/20) porfletely 524-022/1102 Orbt Colorina 0.2500g 1,5-0ipheny/cubuhydrazide (EMD) 107 47/03; EXP: 1/30/13) 7 50 ml W/ACETOXI (EML) LOT # 47154D; EXP: 9/34/12). 524-0228/10/ 0./NHZSOY 5.6 ml and 117804 (emo 49284 exp 11/20/14) 1. 594-0228/10/ WIDIAZO Al: 3/28/12 0228/102 1001 mg/4 CW6+ Inorganic Ventures CGCR (6)1-1 125 ml Clay Glass LOT# D2-CRO3040 121: 3/1/2012-

9/30/12 NH3 FILLING SIN ga 4/26/11 1:1 4250 DMD 49284; EXP:11 ADDED SLOWLY TO 250M/ DI LET COOL CXP: 4/26, 6.25m (come H2SOY (OND 49284; Oxf: 11/20/14 DISSOUTE 1.68753 NN-DINERBY J-DWAY COURT DXWW (Fluica 1363386 13408 Zeig ) 3xp. 87/19 in cooled Suffusic Solp and dilute to 250ml 1:1 H2504 (524-042611 64; OXF: 4/20/12 PAP: 5/25/11

50

524-05791103 ICOD PCR Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM 305 W) 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 49284 exp: 11/20/14). Bring up to volume w/DI H2O; mix and degas. QP: 5/24/11 CAT. No. BDH 5010-500 m L 1101225

7()	
8/22/11	524-0822/104 Cr 6+ Colorine Reagh 0,25g 1,5-0ipheny(Carbohydrazide (Ji Biker; JOS 64 EXP. 6/15/15) I GOW W/ Acetone (EMD:
	0.25g 1,5-0ipheny Carbohy draticle (Ji Biker; Jos 64
	Exp. 6/15/15) 9 50 W W/ Acetone (EMD:
	61, 9/29/11
8/22/11	524-08221105 1000PM Soz stock
	0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
	100 ml w/ Dl Water.
	EXP: 9/5/11
almuli	524-08221106 100 pm 503 Ia/ca
DOUIL	- 1201 0 800 1100 1000 1010 30 3 500/10
	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp; 8/11/14) up to 100 ml w/ DI Water.
	EXP: 9/5/4
8/23/11	524-08231101 1000ppb Gr 6+ Stock
	0/ml 524-02281102 (100100m (x6t; exp. 3/1/12)
	1 100ml w/ f/+ ADJUSTED DI (pH=9.426)
. The second sec	CXP: 3/1/12
8/23/11	534-0823/102 250pp Orbit Ia/Ca
	0.25 <del>0.3</del> mL Ref 524701 57001 (1) 10 exp: 3/2012 up to 100
	mL with pH adjusted (pH= 1426), degassed DI Water.
	EXP: 9/6/1



## 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103245

JPL GW Mon 3Q11 / 100006114 Project:

## **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.

Service Request: P1103245



DETAIL SUMMARY REPORT

Client: Battelle

Project ID: JPL GW Mon 3Q11 / 100006114

Date Received: Time Received: 8/25/2011 15:44

Time Received.	13.44				
					Cr6
au a			Date	Time	196A
Client Sample ID	Lab Code	Matrix	Collected	Collected	1
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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert -Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

## Analytical

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

Page 으

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

(619) 726.7311 Project Manager Company Name & Address (Reporting Information) Client Sample Email Address for Result Reporting NW -SAN DIRRO, CA 3990 ひ子って BATTELLE Owned Campana Į. OID TOWN AUG. C-205 1 CONSER-4199-854 (419 Fax (805) 526-7270 Phone (805) 526-7161 Laboratory ID Number 91120 11/22/2 Date Collected Sampler (Print & Sign) BROGEON 085/ SOS KING Project Number 6/14 Collected P.O. # / Billing Information Project Name 285651 JPL. GW. MON COLUMBUS Time 186000 REPART TEMPRINS 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 Matrix ٤ 'BOTTEllE 0 F 30= Number of Containers Volatile Organics GC/MS 624 □ 8260B □ Oxygena Oxygenates []] TPH Gas (3) 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 Analysis Method and/or Analytes 0 7196 CR Preservative Code CAS Contact CAS Project No. Preservative Key Remarks Other H2SO4 NaOH HNO3 HCL Asc Acid None Zn Acetate of 25

Phone

Temperature°C	Temp	Time.		Date:					4)	. (Signature	Heceived by. (Signature)	lime:	Date.			15	nemsquarred by Taigherthe
pier /Blank / ice / No ice	Coo	TAL	\$	- SE	<u> </u>	LUK		F		. (Signature	- <del></del>	I Ime 75	18 18 Pall		J. S.	TRACTIVE TO THE PROPERTY OF TH	sindulshed by Cagnature
				DateS/23					1000 K	: (Signature		Description of the second	1/82/80	K	1	(6)	Relinquished by: (Signature)
		ANNO MARKATANIA ANNO ANNO ANNO ANNO ANNO ANNO ANNO	s/No	EDD required Yes / No Type:	EDD re	8	ired Yes / No	MRL required Yes / No MDL / PQL / J required	MRL requ		Surcharge	ackage) 10% —-	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	Tier III - (Data Validation Tier V · (client specified)		t if not specified	Tier II - (Results/Default If not specified) Tier II - (Results + QC)
Project Requirements (MRLs, QAPP)	Piroje															ease select	Report Tier Levels - please select
		1000				vene		_									The state of the s
										<u> </u>							
					<u> </u>												
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	<del></del>																
Earypore of BIMA							X					E .	0942	Sh5/1/	3		EB-03-8/15/
							JX					k	6,5%0	18/18/11/0953	The state of the s		MW-17-2
MS /MSD							Χ			ļ	۲		0923	18/8/11	P	8	MW-17-3

## Columbia Analytical Services \*\*\*

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

Page \_

Simi Valley, California 93065

2655 Park Center Drive, Suite A

Bope-Tier 1 - (Results/Default if not specified) Report Tier Levels - please select MM -Email Address for Result Reporting Project Manager Company Name & Address (Reporting Information) Refinquished by: (Signature) Relinquished by: (Signature) Relinquished by: (Signatur Tier II - (Results + QC) 619) 726-771 Client Sample ID Juge -03-MW MW 548 2940 BATTELLE 0.1000 ı Owned Company Dico, CA  $\tilde{\sim}$  $\overline{\infty}$ OID TOWN 30011 N W (000 NER 1 H99-834 (1-19) Phone (805) 526-7161 Fax (805) 526-7270 92110 AUE, C-205 Laboratory ID Number 18/25/11 18/25/11 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) 11/52/18 1/25/1 Collected Date Time Collected 25 Project Number / 6/14 SOS KING AVE. Project Name 1213 P.O. # / Billing Information Date: 785651 SPC. COW. MON. 1144 columbus, of 4320 るかののかれる 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 Ł ٤ Ime X 5 K Matrix BANTELLE Containers Number of Received by: (Signature) Received by (Signati Received by: (Signature) 188 Volatile Organics GC/MS 624 □ 8260B □ Oxygen Oxygenates [] TPH Gas [] TPH Gas 8015B ⊞ MRL required Yes / No MDL / PQL / J required Yes / No BTEX 8021B ☐ MTBE 8021B ☐ TPH Diesel 8015B 🗆 (Subcontracted) TPH Diesel Low Level 8015B □ (Subcontracted) TPH FC 🗆 8015M (Subcontracted) Semi-Volatile Organics GC/MS Analysis Method and/or Analytes 8270C [] (Subcontracted) < P  $\nabla \Gamma$ 7196) reservative Code Type: \_\_\_\_\_\_ Date: Time:/SC する CAS Project No CAS Contact Cooler Alanky Ice / No Ice Cooler / Blank/ Project Requirements (MRLs, QAPP) CEVEL アングラスたか Dophzate: Preservative Key O Ćυ N Remarks A Other H2S04 HNO3 NaOH HOL Asc Acid None Zn Acetate 200

## Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103245

JPL GW Mon 3Q11/100006114 Project:

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103245-001.01					
	7196A	0.00			
		8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11 8/25/11	1619 1731	In Lab / SANDERSON P-37 / SANDERSON	
		0/23/11	1/31	F-5// SANDERSON	_
P1103245-002.01					
	7196A	0/05/11	1540	C) (0 /) (7 /) (0 P /	
		8/25/11	1548	SMO / MZAMORA	
		8/25/11	1549	P-37 / MZAMORA	
		8/25/11 8/25/11	1619 1731	In Lab / SANDERSON P-37 / SANDERSON	
		6/23/11	1/31	F-5// SANDERSON	
21103245-002.02					
		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	
21103245-005.01					
	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					
. 1103243-007.01	7196A				
	, 1, 0/1				

## Columbia Analytical Services, Inc.



Client: Battelle Service Request: P1103245

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	
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	

Printed 8/31/11 9:43 Intenal Chain of Guztody Summary Page 2 of 2 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

## **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:	MZAN	1ORA	
Note: This f	form is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody sea	ls is strictly mea	nt to indicate presence/	absence and not a	as an indic	cation of	
compliance	or nonconformity.	Thermal preservation and p	H will only be ev	aluated either at th	ne request of the	client and/or as require	d by the method/		No	NI/A
1	Wasa samenla	4 . <b></b>		:41- IT	<b>N</b> 0			<u>Yes</u>	<u>No</u> □	<u>N/A</u>
1	-	containers properly n	narked with ci	ient sampie il	) !					
		supplied by CAS?						$\boxtimes$		
3	•	ontainers arrive in go						X		
4	Were chain-o	<b>f-custody</b> papers used	and filled out	?				X		
5	Did sample co	ontainer labels and/or	r tags agree wi	ith custody pap	pers?			X		
6	Was sample v	volume received adequ	ate for analys	is?				X		
7	Are samples v	vithin specified holdin	g times?					X		
8	Was proper te	mperature (thermal p	oreservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Tem	perature: ° C Blan	k Temperature	e: 2° C		Wet I	ce			
9	Was a trip bla	ank received?								X
10	Were custody	seals on outside of co	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?					C			X
	Were seals int									X
		seals on outside of sa	mple containe	r?					X	
		Location of seal(s)?	-				Sealing Lid?			X
	Were signatur	e and date included?					Scaling Lia.			$\boxtimes$
	Were seals int									×
11		rs have appropriate <b>pr</b>	ocorvation o	ecording to me	othod/SOD or	Client enecified in	nformation?	$\boxtimes$		
11		nt indication that the s		•		Chefit specified in	mormation:			$\boxtimes$
					reserveu:					$\boxtimes$
		ials checked for prese			1 77	1.0				
		t/method/SOP require	•		ample pH and	1 <u>if necessary</u> alte	r 1t?			$\boxtimes$
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain n								X
13	<b>Badges:</b>	Are the badges p	roperly cappe	d and intact?						$\times$
		Are dual bed badg	ges separated a	and individual	ly capped and	l intact?				X
Lah 9	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	ot / Pres	ervation	
Lab	oumpie 1D	Description	pH *	рН	рН	(Presence/Absence)	_	Comme		
P1103245	5-001 01	125mL Plastic NP	_	-						
P1103245		125mL Plastic NP								
P1103245		125mL Plastic NP								
P1103245		125mL Plastic NP								
P1103245		125mL Plastic NP				_				
P1103245		125mL Plastic NP								
P1103245		125mL Plastic NP								
P1103245	o-007.01	125mL Plastic NP								
Explain	any discrepanci	ies: (include lab sample	ID numbers):							

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

## Sample Acceptance Check Form

	Sample Acceptance Check Form	
Client: Battelle	Work order: P1103245	d
Project: JPL GW Mon 3Q11 / 100006114		

Sample(s) received on: 8/25/11 Date opened: 8/25/11 MZAMORA by:

Sample(s) received on: 8/25/11				Date opened:	by: MZAMORA		
Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		
P1103245-008.01	125mL Plastic NP						

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

## 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 Units: mg/L (ppm)

Analysis Method: 7196A Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-17-4	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 Kall Pya Date: 8/29/11

Report By:SAnderson

## QA/QC Report

0.003

0.003

Client: Battelle

Project: JPL GW Mon 3Q11 / 100006114 Service Request: P1103245 Date Analyzed: 08/25/11

ND

ND

Title:

Initial and Continuing Calibration Blank (ICB and CCB) Summary

0.010

0.010

Karu Rya

Analyte:

Chromium, Hexavalent

Method: Units:

CCB1

CCB2

7196A mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Date: 8/29/11

QA/QC Report

Client: Project:

Battelle

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:

CCV1A/120594

Date

WBMIX.XLT

Kam Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q11

Project Number: Sample Matrix:

100006114 WATER

Service Request:

P1103245

Date Collected: Date Received:

NA NA

Date Extracted: NA Date Analyzed:

08/25/11

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

mg/L (ppm)

CAC

P1103245-LCS

Basis: NA

Units:

Lab Code: Test Notes:

	Prep	Analysis				Recovery Acceptance	Result
Analyte	Method	Method	True Value		·		Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0404	101	90-110	

Kar Rya Approved By

Report By:SAnderson

14 of 25

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

P1103245-002MS

P1103245-002DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0431	0.0431	86	86	73-119	<1	

Karun Rya

Report By:SAnderson



			pH Run		og	zare.		,
Service Reques	t #(s):	P110	3244	,	110324	<u>S</u>		
Time: 0734								
Sample	V	WR lot#	Exp.		Slope		Prep.	Run#
pH 2 Buffer	224-	05201101	12/2012		7 0	- <b>,</b>	~ <u></u>	
pH 4 Buffer		-05201102	9/30/12	$\  \ $	£98,0°	/b	Ru	<u>n#</u>
pH 7 Buffer pH 10 Buffer		042411024	0/2013		) /5.0		* American ports."	THE STATE OF THE S
			-11-1 (2) 20.45	J L	A) 00.45D (			
pH in liquid: (1) 904		,				ethod num	ber in column labele	d # below )
pH adjustment:(5) Sample	/196A,	(b) /199 (Note	Temp. <sup>6</sup> C	umi	Sample	#	На	Temp. <sup>6</sup> C
pH 2.000	5	1.90	20.2	11	P1103245-60		1.869	14,40
	-	1/0/7	70,9		-1109673 6.0 -17.0	1		11/20
pH 4.000		7.009	2100		- <del>'</del>		1.785	24.7
pH 7.000		<u> </u>	2100		PH 2.000	, S	2,022	15.10
pH 10.000	, 2	10.015	21.00		P1103245-80		11714	16.1
Ref#: 524-0520110	1	7.400	21.50		PH2.000	$ \cup$ $  $	2.022	HIT
DI		2.049	21.3°		/			di-
pH 2.000	<u> </u>	1.993	70.2°					and the second s
TIME: 16:	<i>50</i> .	8		a l				^
PH 2.000	5	2.013	22.0°					CA MILES CONTRACTOR
P103244-1.01	Ì	2.019	13,3°		a commence of the second secon			A ACCUMENTATION
T-2.01		1.807	D.90			a l	LIUM	
V -301		1871	13.30			MU	J W	icu: Beaddo
A103245-1.01	equestion of the second	1.977	12,50					makilindish.s
2.01		1.823	13,10		, i			SE TO SE TO SE
-3.01		1.801	1390		- Constitution of the Cons			d Shanking and a
-4.01		1,79/	14.10		Control of the contro			A CONTRACTOR OF THE PARTY OF TH
1/ -501	W	2.086	1390					A CONTRACTOR OF THE CONTRACTOR
pH Adjustments:	719	<del></del>	Conc H <sub>2</sub> SO <sub>4</sub>	MI	) 44284 EXP:	11/	oliy	Ţ
			NaOH			1	<del></del>	
Comments:								
* Soil or Solid pre	ep: 1:1	(wt:vol) with	DI water: ** S	Sar	nples received	past re	ecommended	hold time.
			ion changed:		· · · · · · · · · · · · · · · · · · ·	,		
Note: ATC probe						on is n	ot necessary.	
	(	7				~*	10-1.	
Analyst:	/2	201		-	Date:	8	125/11	
Reviewer:		KK		-	Date:	8/3	26///	pH.XLS

## Hexavalent Chromium (Liquids)

шэ Апагусіса	il Services	5 <sup>™</sup> Method EP <sub>A</sub>	A 7196A				70
Service Request#(s):	P110324	4 81103245	Run#:	2510	32		
Stock#: <u>524-0228/</u>	103 T.V=101	MM Al 3/28/12	Prep Run#:			12.1. h	1
CV/CCV#: 524-1015	1001 113	1108/101 ONP. 3/20/2	2 Conc. H <sub>2</sub> SC	04 Lot#: EM	0 49284	EXP; 11/001	14
			Coloring Re	eagent Ref#:	5:24-68.23/1	104 Dr.	P 9/20/11
Work	ing Curve:	Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coef;
		Concentration mg/L	0.00	0.01	0.05	0.1	0 9499 509
		Absorbance (a. 540 nm	0,000	0.011	0.055	0.112	0.7977569

			ration mg/L c(a; 540 nm	0.00	0.01	0.05	0.112	0.999956401
1		210307 Dunec	16, 340 nm	1 0,000	0.011	0,095	0.112	
To a construction of the c	Sample #	Sample Vol.(mL)	Dilution	Bkg.	Absorbance	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	Ich	10m/	_	1 0.000	0,000	0,000	0.00045	20.003
_2	ICV 0.05PPM			1 0,000	0.058	0.058	0.6521	104%
3	MB			10.000	0,000	0,000	0.000245	14.003
4	US 0.04PFM			1 0000	0.045	0.045	0,0404	10/%
5	f1103244-1.01			10,000	0.006	0,006	0.00561	8790-78/2
, 6	1-1.01 MS 0.0	5PM	and the second s	0.000	0.052	0.052	0.0467	82703
7	-1.01 MSD I	Quantities of the same of the		0.000	0.053	0.053	0,0476	84% SA
8	-2.01		All the second of the second o	10,000	0,000	0.000	0.000245	20,003
9	-20/VSag	PH		1 0,000	0.039	0,029	0.6262	87%
10	V -3.01			10.001	0.00	0.001	0.00/14	10.003
111	P1103245-1.01		,	0.003	0.004	0.001	0.00114	10.003
12	V -1.01 VS 1.0	Blin		0.003	0.033	-1.0,09	0.0262	876/
13	CiV/ 0.05//m		parameters.	10,00	0.057	0.057	0.0512	102%
4	CCB1			0,000	0.000	0.000	0.000245	20.003
15	P1103245-2,01		***************************************	0.005	0.006	0.001	0.00114	10.003
6	1 -2.01 MS	ausphu		V 0.005	0.053	0.048	0.0431	86% 7
17	J -2.0/ MSD	1	<u> </u>	10.003	0.053	0.048	0.0431	86%
	pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment							
Ŋ	ICV/CCV spiked with							ļ
in.	MS/MSD spiked with		524-021811	Promoter C.		=	= "	
T.	LCS spiked with erification Standard Spiked	0.2  ml of $\mathcal{C}_{i}$ , $\mathcal{Z}_{i}$	ml of .	$\frac{1}{\sqrt{2}}$ 30 ml of	• .	I Water (T.V.= mple (T.V.= 0	* *	
-m V	Comments:	<i>U</i> , 7	III O	<u> </u>	i to mi or sai	mpie (1.√.= <u>⊘</u>	ppm)	
The state of the s		te des constitues de la constitue de la consti				······································		
4	Prepared By:				Date/Time:	shdu	(W 1050	
	Analyzed By:				Date/Time:	Q/DEIII	TW 1705	
	Reviewed By:				Date:	8/261	11	
•	,				-	7 7	<del></del>	

## Columbia Analytical Services

## Hexavalent Chromium (Liquids)

page 20/2 91

Analytical Service	es <sup>™</sup> Method EPA	4 7196A			المصمح	91
ervice Request#(s):	44 PHO3245,	Run#:	2590	<i>32</i>		
Stock#: 534-6238/1067.00	10/1/m EN 2/08/10	Prep Run#:	·		- 1/2-	ha
CVICCV#: 624-10151001 1	11-100PPM CXP:3/2	7/ <b>Ç</b> onc. H <sub>2</sub> SC	O4 Lot#:	10 49284	EXP: 11/001	17
Stock#: <u>534-64-10/5/001</u> CV/CCV#: <u>634-10/5/001</u>	. tar	Coloring R	eagent Ref#:_	<u> 524-087).</u>	1104 EXF.	9/2/11
Working Curve:	Prep Dilution	N.A	0.05/50	0.25/50	0.5/50	Corr. Coeff.
	Concentration mg/L	0.00	0.01	0.05	0.1	0.9995640
	Absorbance (a; 540 nm	0,000	0.011	0.055	0.112	0. 1995099

Store against	Sample #	Sample Vol.(mL)	Dilution		Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - _mg/L	QA/QC - %R / RPD
1	P1103945-3.01	10m/		س	0.000	0.000	0,000	mgA 20,003	
2	1-4.01		Na garagements		0.001	0.001	0,000	0.000245	10,003
3	1 -5.01				0.000	0.001	0.001	0.00114	and a second
4	-6.01				0.000	0.000	0.000	6.000245	
5	-9.01	No Personal Property Company	المتعدد ال		0,000	0.000	0.000	d d	
6	-8.01		, graphetississe,		0.000	0.000	0.000	J/	
77	MRL CHECK O.O.I PPM		ngga ngantagana.		0.000	0.010	0.010	0.00918	99%
8	CUV2 0,05PPM		province of the second	$\checkmark$	0,000	0.057	0.057	0.0512	102%
9	(UB)			V	0.000	0.000	$o.\omega o$	0.000145	10,003
0	(								
11					44		:		
2									
13				-					
4		SUU	L 1110-		UN	_			
15									
6									
17					ĺ				
	pH Requirement:	Method 71	96A (2 ± 6	9.5),	E Samples	filtered prior	to pH adjustm	ent	

15						
6						
17						
	vith 0.05 ml of <u>s</u> with 0.05 ml of <u>s</u> with 0.2 ml of _	24-1015100 <sup>120</sup> 13 24-022811 <sup>03</sup> 1	10 ml of pH adjusted 50 ml of pH adjusted	DI WATER (T. sample (T.V.= 0	V.= <u>6.65</u> ppm .05 ppm) = 0.04 ppm)	.)
Comments:				·		
Prepared By: Analyzed By: Reviewed By:			Date/Time: Date/Time: Date:	5/25/11 5/25/11 8/26/	(10/1650) (10/1650) (11	-

40	
10/16/10	524-10061001 25133pp Stock for 03
	P.05 ml Pyridine-4-carboxaldehyde Alfa Aesaw
- JW	10146598 ;Exp: 8/11/D) up to 500 ml w/ D1 Water.
	EXP: 10/20/10
10/6/10	524-10061002 25133996 Jakev for 0:
- SV	0.05 ml Pyridine-4-carboxaldehyde TEI
	(;Exp: \frac{9}{10}/2) up to 500 ml w/ 1)1
1	EXP: 10/20/10
	Ext. 10/50/10
r	2016 1206 1002 01001 01-
10/1/10	524-1006/003 MBTH SO/M
10/0/10	0.5000 g MBTH (Aldrich 54646EK; Exp: 8/7/14) up
, S	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> and 44784; CX 11/2
	EXP: 10/7/10
Inlilla	524-10151001 Or6+ IOV/CON Starle
10/2/10	524-1015/001 (NO) ION/COV Stufe
	furchased 100th 11 Com
10 March 1 and 1 March	FRICCA Chemical Co Cyt No 2095-16
	500ml Plastic
k	LOT# 10/0/77
	LOT# 10/0177 EXP: 3/20/2
· Inlict	524-10151002 500PM NOZ Stock
10/15/10	504-10151002 SUUTPICE STOCK
	Purchas Cd
·	Rech Chemical a lut No: 5444-5-4
v	LOT# 1010271 120 ml amber 9/45
	Volume of the control

04 524-0221101 1:142504 4 (BND 49284; AP: 11/20) MY TO 250M DI. (00/ 524-022/1102 Wet Colorina 0.2500g 1,5-0ipheny/cubuhydrazide (EMD) 107 47/03; EXP: 1/30/13) 7 50 ml W/ACETOXI (EML) LOT # 47154D; EXP: 9/34/12). 524-0228/10/ 0./NHZSOY 5.6 ml and 117804 (emo 49284 exp 11/20/14) 1. 594-0228/10/ WIDIAZO Al: 3/28/12 0228/102 1001 mg/4 CW6+ Inorganic Ventures CGCR (6)1-1 125 ml Clay Glass D2-CR03040 121: 3/1/2012-

9/30/12 NH3 FILLING SIN ga 4/26/11 1:1 4250 DMD 49284; EXP:11 ADDED SLOWLY TO 250M/ DI LET COOL CXP: 4/26, 6.25m (come H2SOY (OND 49284; Oxf: 11/21) DISGOLDE 1.68757 NN DIMETLY J-D(WWW (Fluica 1363386 B408 Zog) in cooled Suffusic Solp and dilute to 250ml 1:1 H2504 (524-042611 64; OXF: 4/20/12 PAP: 5/25/11

50

524-05791103 ICOD PCR Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM 305 W) exp: 6/15/16) 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 49284 exp: 11/20/14). Bring up to volume w/DI H2O; mix and degas. QP: 5/24/11 CAT. No. BDH 5010-500 m L 1101225

7()	
862/11	524-0822/104 Cr6+ Coloring Feach 0.25g 1,5-0ipheny(carbohydrazide (JiByler; Jos 64 Exp. 6/15/15) I GNN W/ Actoré (EMD: Cot 47/54D EXP: 9/24/12)
	0.25g 1,5-0ipreny/Carbohydrazide (Ji Biller; Jos 64
* ************************************	Exp. 6/15/15) 9 50 NW W/ Acetone (EMD)
	EXP: 9/22/11
8/22/11	524-08221105 1000PM SUZ STUCK
- SV	### ### ### ### ### ### ### ### ### ##
	f 00 ml w/ Dl Water.
	EXP: 9/5/11
8/0///	524-0822/106 100 pm 503 Ia/ca
	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp. 8/11/14) up to 100 ml w/ Dl Water.
1	EXP: 9/5/4
dooli	011 28021101 1012 ml (6+ c/h
8/3/11	524-08231101 1000 pplo ( Stock
D	0.1 ml 524-02281102 (1001 ppm Cr6+; exp: 3/1/12)
	OXP: 3/1/12
6/07/1	au -0822402 amout Old Tallacu
8/03/1	534-0833/102 2.50pp (Vot 10/00) 0.055 0.35 mL Ref 52410,57001 (2) 10 exp: 3/2012 up to 100
	mL with pH adjusted (pH= <u>942(</u> ), 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: 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

The Judesta

Sue Anderson Project Manager



Client: Battelle CAS Project No: P1103256

JPL GW Mon 3Q11 / 100006114 Project:

### **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.

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

Date Received: Time Received: 8/26/2011 12:40

Service Request: P1103256

			Date	Time	96A
Client Sample ID	Lab Code	Matrix	Collected	Collected	71
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.



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

Page \_\_\_ of\_

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

Deal Complete   Deal Complet
Time in Business Days (Surcharges) pleases circle   CAS Contact
Indition in Business Days (Surcharges) please circle   CAS Contact   C
CAS Contact:  Preservative K  Preservative K  0 None 1 HCL 2 HNO: 3 H2SC 4 Naoh 5 Zn Av 6 Asc.) 7 Other  Times  Project Requirements (MRLs. Q. Project Blank / be / No loe Times  Temporative Cooler (Blank / be / No loe
CAS Project No. CAS Contact:  CAS Contact:  Preservative K  0 None 1 HCL 2 HNO. 3 H2SC 4 Nach 5 Zn Av 6 Asc J 7 Othel  Timps C Cooler (Blank / be / No Ice Timps C Cooler (Blank / be / No Ice Timps C Cooler (Blank / be / No Ice
CAS. Project No. CAS. Contact:  Preservative K 0 None 1 HCL 2 HNO: 3 H2SC 4 NaOH 5 Zn Av 6 Asc J 7 Othel Project Requirements (MRLs, Quentities Color
and the second of the second o

### Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103256

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	

### 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

### **Sample Acceptance Check Form**

	Battelle		2221101201			Work order:	P1103256			
•		3Q11 / 100006114								
• `	s) received on:			•	Date opened:			SSTAF		
Note: This form is used for <u>all</u> 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.										
compliance	or nonconformity.	Thermal preservation and p	oH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S	SOP. <b>Yes</b>	<u>No</u>	N/A
1	Were sample	containers properly n	narked with cl	ient sample IT	)?			X		
2	Container(s) s	×								
3	Did sample c		$\boxtimes$							
4	Were chain-o		$\boxtimes$							
5		ontainer labels and/or			pers?			×		
6		volume received adequ			, ,			X		
7	-	vithin specified holdin	•					X		
8	-	emperature (thermal p	•	of cooler at rec	eipt adhered	to?		X		
		nperature: ° C Blan			1	Wet 1	[ce			
9	Was a trip bla	•	<u>r</u>	. – -						X
10	-	seals on outside of co	ooler/Box?						X	
	•	Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int									X
	Were custody	seals on outside of sa	mple containe	r?					X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?					•			X
	Were seals int	act?								X
11	Do container	rs have appropriate pr	eservation, ac	ccording to me	ethod/SOP or	Client specified i	nformation?	X		
	Is there a clie	nt indication that the s	submitted sam	ples are <b>pH</b> p	reserved?					X
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clien	nt/method/SOP require	that the analy	st check the sa	ample pH and	d if necessary alte	r it?			X
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							X
13	Badges:	Are the badges p	roperly capped	d and intact?						X
		Are dual bed badg	ges separated a	and individual	ly capped and	l intact?				X
Lah	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	it / Presi	ervation	
Zuo	oumpie 12	Description	pH *	рН	pH	(Presence/Absence)		Comme		
P1103256	5-001.01	125mL Plastic NP								
P1103256		125mL Plastic NP								
P1103256		125mL Plastic NP								
	P1103256-004.01									
F1103230	0-003.01	125mL Plastic NP								
Explair	any discrepanc	ies: (include lab sample	ID numbers):							
•		•								

 $RSK - MEEPP, HCL\ (pH{<}2); RSK - CO2, (pH\ 5{-}8); Sulfur\ (pH{>}4)$ 

### 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	POL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
- Compression of the Compression	200 0000	- 4				J	~~~~	
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	
M W-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	

Kam Rya

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:

CRMDI /120594

Date: \_\_\_

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
CCVI	0.0500	0.0513	103	90-110

Approved By: Hau Rya

Date:

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q11

**Project Number:** 

100006114

Sample Matrix: WA

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

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		.*	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By

Kar Rya

Date

8/29/11

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

P1103256-001MS

P1103256-001DMS

Units: mg/L (ppm)

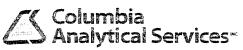
Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0504	0.0504	101	101	73-119	<1	

Kau Pyan

Date:



			pH Run	Lo	9			•
Service Reques	st #(s):	:	P1103256					• •
Time: 1000	0							
Sample	VWR lot #		Ехр.		Slope		Prep.	Run#
pH 2 Buffer	524	05201101	12/2012	17	$\int$	)		
pH 4 Buffer	+	0520/102	9/30/12	10	48.2 /	( ( )	Rı	ın#
pH 7 Buffer		0427116ZA	3/20/3	1	10.			
pH 10 Buffer pH in liquid: (1) 90		00400 pH in 6	9/30/13	(4) (4)	0045D /N==	. 411		
pH adjustment:(5)						etnoa nun	nber in column labeli	ea # Delow
Sample	#	рН	Temp. <sup>0</sup> C		Sample	#	На	Temp. °C
pH 2.000	5	2.000	20.R°					-
pH 4.000	II	4.015	21.00					
pH 7.000		7.014	21.10				·	
pH 10,000		10.007	21.2					
Ref#: 424-0520110	3	7,388	21.40					,
DI		2.039	20.1					
pt 2.000	V	2-,004	20.80					
TIME: 140	10 <u> </u>	Sol			···			
0112,000	5	2.000	21.40					
P1103256-1.01	/ 丁	2.000	15.80					
1-201		1.815	15,70					
3.01		2.018	15.80				/	
-4.01		1.904	16.30		<i>Sfl</i>	W	not at	0/
V -5.01		1.810	16.20		/			
PH 2.000	1	2.004	20.8					
pH Adjustments:						- Aw -	11/20/14	
0			NaOH		EXP:	8/26	(1	
Comments:							·	
* 0 - 9 0 - 9 -		(t., c=1) 211	D1					
* Soil or Solid pre						past re	ecommended	noid time.
Note: ATC probe			on changed:		' ' L	on ic n	ot necessary	
avote. A rec probe	us <del>u</del> u,	illereture, le	mperature (0	n ect	ion calculati	он is п	or necessary. T	
Analyst:		SOV			Date:	8/90	0/1/	
Reviewer:		V KR			Date:	7	20/11	pH YES

_) And	alytical Service	S INC	M	ethod E	PA	7196A				92
ervice Requ	est#(s): 0//63	256			<b>L</b>	Run#:	25%	12/2		
tock#: <u>524</u>	-02281103 T.V=1	OPPM	_ex.	P. 2/28/1	2	Prep Run#			· · · · · · · · · · · · · · · · · · ·	12. 1.
CV/CCV#:_	524-10151001 Til	1-100	ff M	EXP:3/2	2012			m0 49280		
		<del></del>			.,			94-0822		,
	Working Curve:	Co		ep Dilution ration mg/L	<del></del>	NA 0.00	0.05/50	0.25/50 0.05	0.5/50 0.1	Corr. Coeff.
				(a) 540 nm		0.000	0,0//	0.058	0./15	0.999913593
	that are a second as a second				\	<del></del>		Corrected		
		San	nple	\E	:\		Absorbance	Abs.	Results -	QA/QC - %R
	Sample #	1	•	Dilution		Bkg.	@: 540nm	(minus bkg.)	mg/L	/ RPD
Ich		100	$m/_{\perp}$	·	/	0.000	0,000	0.000	0.000/19	100.003
ICV	0.05 fly				1	0,000	0.059	0.059	0.0513	103%
MB	71				/	0.000	0,000	6.000	0.000/19	10,003
1 115	0.04PM					0.000	0.048	0.048	0.0417	104%
P11032	56-1.01			_	1	0.600	0.00/	0.001	0.000979	10,003
5 (	1.01 MS 0.051	PM		_		0.000	0.058	0.058	0.0504	
7	-1.01 MSD J			***************************************		0.00	0.058	0.058	0.0504	1019050
8	-2.01				/	,0.001	0.003	0,000	0.00185	20.003
9	-2.01 VS 6.071	PM			/	0.001	0.036	0.035	0.0305	102%
0	-3.01	/				0.000	0.002	0.002	0.00185	20,003
1	-4.01			ganner.		0.00	0,002	0.002	1	T
2	5.01					0.000	0.000	0.000	0.000119	20,003
3 CIV/	0.05 PPM				/	0,000	0.059	0.059	0.0513	103%
4 CCB	/	4			<i>i</i> /	0.000	19.000	0.000	0,000119	10.003
5								2		
6				Spll	l	(MOF	ased			
7		1	U	/		,				
<u>.</u>	pH Requirement: 1	Metho	d 71	96A (2 ±	0.5)	*Samples	filtered prior	to pH adjustm	ent	
ICV										
	MS/MSD spiked with LCS spiked wit									
Verification	Standard Spiked		III OI	ml of	T,	u ·		nple (T.V.= $\underline{\mathcal{O}}$		
N:	Comments:									- Andrews in the state of the s
								5/64/7		
Prepared 1		<del></del>					Date/Time:	813611	1425	
Analyzed I Reviewed							Date/Time: Date:	8/36/1/	11	
acriewed.	Dy.						Date:	- Ofotoff	/	

40	
10/16/10	524-1006/001 25/33ppb Stock for 03
	## Pyridine-4-carboxaldehydc Alfa Aesau
, market and the second	EXP: 10/20/10
, ,	
10/6/10	524-10061002 25133996 Jala For 0:
SN	0.05 ml Pyridine-4-carboxaldenyde TCI
	( <u>IC;INC</u> ;Exp: \$/10//2) up to 500 ml w/1)! Water.
	EXP: 10/20/10
- 1-1-	524-1006/003 MBTH SO/M
10/6/10	0.5000 g MBTH (Aldrich 54646EK; Exp. 8/7/14) up
50/	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 49784; EXT 11/2
	EXP: 10/7/10
10/15/10	524-10151001 Cr6+ ICV/COV Starle
	Purchased 100 PPM Cr6+
	FRICCA Chemical Co Cyt No 2095-16
	500ml Mastic
,	LOT# 10/0177
	LOT# 10/0177 EXP: 3/20/2
10/15/10	524-10151002 500PM NOZ Stock
	Purchased
, Oov	RCA Chemical Co (ut No: 5444-5-4 LOT-# 1010271 120 ml almber 9/45)
**	LOT# 1010271 120 ml amber 9/455

524-0221101 1:1H2504 0.2500g 1,5-01/heny/carbohydrazide (EMD 107 47/03) EXP: 1/30/13) 7 50 ml W/ACETOXI (EMD) LOT \$ 47154D; EXP: 9/34/12 EXP: 3/21/11 0.1WHZSOY 594-0228/101 5.6 ml and 1/2 Dy (omo 49284 BXP 111/20/14) W/DI 470 EXP: 3/28/12 -0228/102 1001 19/1 ON6+ Ventures CGCR (6)1-Inorganic 125 ml Clear Glass D2-CR03040 1281: 3/1/2012

500PPM NOZ 1162544 8/2011 (CMD 46321715B W10I H20 EXP: 4/17/11 Reviewed And Approved By: Initial: 1 Date 3/8/1 534-04141101 ICO2 524-04291002 (10x Conc Givent, exp 4/29/11 750m1,W1 4/28/1

NH3 FILLING 94/26/11

Ship	584-05191103 ICO2 PCR
	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (Ewi 30564)
100	exp: 6/18/15) in 100 mL Methanol (B&J AD806 exp: 4/18/14)
	Add to 1 L volumetric flask containing 500 ml. DI water +
	5.6 mL conc. H2SO4 (EMD 44284 exp: n/20/14). Bring up to volume w/ DI H2O; mix and degas.
	EXP: 5/24/11
5/20/11	524-0520 1101 PH 2,000 BUPPER
20/	purchasa '
- 70	BOH CAT. NO. BOH 5010-500 ML
	101# 1101225
	EXP:12/2012
- looks	334-05201102 DH 4.000 BUSTER
-5/50/CI	
- A	furchasel
	JT Baker CAT # 5657-01 500mC
	10T# J36503
	EXP: 9/30/10
*	
Amili	501. 8 5001102 St 736 BUCCOR
3/20/1	Digging files
- X	furchased
	BOIT CAT # BNHS058-500mL
	LOT# 1103360/
_	10x: 3/2013
The state of the s	
The second secon	
£.	

	70	
	8bəlu	524-0822/104 Cr6+ Coloring Reach
	S	524-0822/104 Cr6+ Colorine Feagle 0,25g 1,5-0ipheny/Carbohydrazide (Ji Byker; 50564, Exp. 6/15/15) 9 50 NV N/ Actor (EMD)
F		6/15/15)   GIN W   HELTON (BMD:
-, - · · · -		EXP: 9/22/11
-	8/22/11	524-08221105 1000PM Soz stock
-	SW	0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to
_		j 00 ml w/ Dl Water.
		EXP: 9/5/11
	8/22/1	524-08221106 100 pm 503 50/cg
	8	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
- 1 -		EXP: 9/5/4
	alaalit	524-08231101 100000 (x 6+ Stock
	8/33/11	0/ml 524-02281102 (1001 ppm (r6+; exp: 3/1/12)
		1 100 ml w/ p/f ADJUSTED DI (pH= 9.426).
31 PA		OXP: 3/1/12
F .	8/23/1	534-0823/102 25000h (Vot Tallow)
***************************************		0.25 0.35 mL Ref 5.24.401.5[00] (W 10 exp: 3/2012 up to 100
		mL with pH adjusted (pH= 9,426), degassed DI Water.
		EXP: 9/6/1



### 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103282

JP-GW-3Q11 / 100006114 Project:

### **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.

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

Date Received: Time Received: 8/29/2011 15:52

Service Request: P1103282

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert -Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

## Analytical Services \*\*

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

Page 앜

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

Client Sample ID Project Manage Email Address for Result Reporting Phone Company Name & Address (Reporting Information) DAMBER Owned Company Laboratory ID Number 8-29-11 パルデライカ Sampler (Print & Sign) Collected Date Collected Project Number Project Name P.O. # / Billing Information 100000 me 000 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 Matrix Containers Number of Volatile Organics GC/MS Oxygenates [] TPH Gas [] 624 □ 6260B 🗀 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 Analysis Method and/or Analytes Preservative Code CAS Project No. CAS Contact: Preservative Key Remarks NaOH H2S04 HNO3 H C H None Other Asc Acid Zn Acetate 5 of 23

Tier 1 - (Results/Default If not specified) Report Tier Levels - please select

Tier II - (Results + QC)

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### Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103282

JPL-GW-3Q11/100006114 Project:

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	0.100.14.4	4 600	01 to 100 T T0	
		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	

### 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

### **Sample Acceptance Check Form**

	Battelle					Work order:	P1103282				
		11 / 100006114									
_	s) received on			•	Date opened:			SSTAI			
		samples received by CAS.							cation of		
ompliance	or nonconformity.	. Thermal preservation and p	pH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S	OP. Yes	<u>No</u>	N/A	
1	Were sample	containers properly i	narked with cl	ient sample II	)?			X			
2	Container(s) supplied by CAS?										
3	Did <b>sample containers</b> arrive in good condition?										
4	Were <b>chain-of-custody</b> papers used and filled out?										
5	Did sample o	container labels and/o	r tags agree wi	ith custody pa	pers?			X			
6	Was sample	volume received adequ	uate for analys	is?				X			
7	Are samples	within specified holding	ng times?					X			
8	Was proper to	emperature (thermal ]	preservation) o	of cooler at rec	eipt adhered	to?		X			
	Cooler Ter	mperature: ° C Blan	k Temperature	e: 2° C		Wet 1	Ice				
9	Was a trip bl	lank received?								X	
10	Were custody	y seals on outside of co	ooler/Box?						X		
		Location of seal(s)?					Sealing Lid?			X	
	Were signatur	re and date included?								X	
	Were seals in	itact?								X	
	Were custody	seals on outside of sa	mple containe	r?					X		
		Location of seal(s)?					Sealing Lid?			X	
	Were signatu	re and date included?								X	
	Were seals in	itact?								X	
11	Do containe	ers have appropriate pr	reservation, ac	ecording to me	ethod/SOP or	Client specified i	nformation?	X			
	Is there a clie	ent indication that the	submitted sam	ples are <b>pH</b> p	reserved?					X	
	Were <b>VOA</b>	vials checked for prese	ence/absence o	f air bubbles?						X	
	Does the clie	nt/method/SOP require	e that the analy	st check the s	ample pH and	d if necessary alte	er it?			X	
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X	
		Do they contain r	noisture?							X	
13	Badges:	Are the badges p	roperly cappe	d and intact?						X	
		Are dual bed bad	ges separated a	and individual	ly capped and	l intact?				X	
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation		
	•	Description	pH *	pН	pН	(Presence/Absence)		Comme			
1103282		125mL Plastic NP									
1103282		125mL Plastic NP									
1103282		125mL Plastic NP									
	103282-003.02										
1103282		125mL Plastic NP									
		2 2 2 2 2 2									
Explain	any discrepanc	cies: (include lab sample	ID numbers):					_			
_	-	•									

 $RSK - MEEPP, HCL\ (pH{<}2); RSK - CO2, (pH\ 5{-}8); Sulfur\ (pH{>}4)$ 

Analytical Report

Client:

Battelle

Project Name: Project Number: 100006114

JPL-GW-3Q11

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

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
M W-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	

Kau Rya

Report By: SAnderson

QA/QC Report

Client: Battelle Service Request: P1103283

**Project:** JPL GW Mon 3Q11 / 100006114 **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: ICCBMDL/120594

Date

WBMIX.XLT

Kam Rya

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:

CCV1A/120594

Date

WBMIX.XLT

Kaur Rya

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL-GW-3Q11

**Project Number:** Sample Matrix:

100006114 WATER

Service Request:

P1103282

Date Collected:

NA

Date Received: Date Extracted:

NA NA

Date Analyzed:

08/29/11

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P1103282-LCS

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Date:

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

Lab Code:

P1103282-003MS

P1103282-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0425	0.0442	85	88	73-119	4	

Karu Rya

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

Lab Code:

P1103282-004MS

P1103282-004DMS

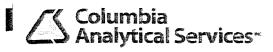
Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result	•	oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	MRL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0383	0.0383	77	77	73-119	<1	

Kam Rya



		,	pH Run		og			
Service Reques	st #(s):	f	01103282		P110308	3		
Time: 0830	-							
Sample	VV	VR lot#	Exp.		Slope		Prep.i	Run#
pH 2 Buffer	524-0	5201101	12/2012	the contract of	$\overline{}$	$\cap$	-	-
pH 4 Buffer		0520/102	9/30/12		1 00000		Ru	n#
pH 7 Buffer	<del></del>	04271102A			70.00	O	,	
pH 10 Buffer	524-	04261102	9/30/2012	2	<u>J</u>			
<b>pH in liquid:</b> (1) 90-						thod num	nber in column labele	d#below)
pH adjustment:(5)			method # In colu Temp. ⁰C	ım		.11	-1:	Temp. ⁰C
Sample	#	pΗ			Sample	#	pH	remp. C
pH 2.000	5	1,999	20.40		P11032835.01	5	1.905	16.1
pH 4.000		3.991	20,50		DH 2.000	_5_	2,030	21.4
pH 7.000		7,003	20.80					A before it
pH 10.000		10,000	20.90					the state of the s
7.0= 7.38 CAP. 31. Ref#: 924-05201103	20,3	7.388	21.10					
BI		2.077	21.80					
PH 2.000	1	2.002	20.30					
TME : 164	2	Vi-						
042000	5	2.024	21.50					
11103282-1.0)	Ŧ	1.899	13,90					
1-2.01		1.882	13.70	- Cartago		<	mo not	used
-3.01		1.846	13.60			્ય		
1 -4.01		1.873	13.90					
P1103283-1.01		1.917	14.40		\			
T-2.01		2099	14.70					, Turk and the second
-3.01	2224	1.887	14.8	la constant				
11-4.01	V	1,880	14.80					and sent and a second a second and a second
pH Adjustments:	≥7190	6A: Diluted/0	Conc H <sub>2</sub> SO <sub>4</sub> A	Uj	0 49284EXP:	11/2	olly	and the second s
pH Adjustments:	_ 719	9 <b>A</b> : Diluted I	NaOH		EXP:		,	
Comments:								
* Soil or Solid pre	ep: 1:1(	(wt:vol) with	DI water: ** S	aı	mples received	past re	ecommended	hold time.
			ion changed:			<u>.                                    </u>	·	
Note: ATC probe			•			on is n	ot necessary.	
•	(					01-1		
Analyst:		TOV	<del>,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>		Date: _	0/9/	1',	
Reviewer:		FF			Date: _	8/3	0/11	pH.XLS

Columbia Analytical Services

Method EPA 7196A

rvice Request#(s):	P110328Z		
ock#: 524-082	191102 TiV=	10PPM EXP:	2/29/12

VICCV#: 524-10151001 T.V=100ffM PNP: 3/2012 Conc. H2SO4 Lot#:

Chromium (Liquids)

7196A

Run#: \_\_\_\_\_ 259445

Prep Run#: \_\_\_\_\_ Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: \_\_\_\_ EMP 49284 EAP: 11/20/14

Coloring Reagent Ref#: \_\_\_\_\_ 524-08.321104 CXP: 9/22/11

Working	Curve:
---------	--------

Prep Dilution	NA NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	1 GOGGHET 2
Absorbance (a. 540 nm	0.000	0.012	0.061	0.119	0.79770137

1 m m m m m m m m m m m m m m m m m m m	S	Sample #	Sample Vol.(mL)	Dilution	~ \	Bkg.	Absorbance @: 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/Q€ - %R / RPD
	ICB		10m1		600	0.000	0.000	0.000 -	0.000271	20.003
	IW	0.05PM			V	0.000	0.063	0.063	0.0526	105%
3	MB				V	0.000	0.001	0.001	0.000568	10.003
1	165	0.04PFM			V	0.000	0.050	0.050	0.0417	104 %
5	P11032	82-1.01	Spirite and the spirite and th		V	0.002	0.004	0.000	0.66141	20.003
5		-1.01 VS 0.03.	PM.			0.00	0.033	0.031	0.0257	86%
7		-2.01	and the second s	~		0.002	0.004	0.002	0.00141	20.003
3		- 3,01		_		2.002	0.005	0.003	0.00225	20.003
9		-3.01 MS 0.05	Pm	~		0.002	0.053	0.051	0.0425	85274
		-3.01 MSD				0.002	0.055	0.053	0.0442	88% SARC
		-4.01	A ANNE POR CONTRACTOR		1	0.003	0.004	0.001	0.000568	10.003
2	V	-4.0/MS0.00	Am			0.003	0.049	2.046	0.0383	77%
3	COVI	e J			1	0,000	0.063	0.063	0.0526	105%
1.	[(6)		MAC may disk of the Lag.	_	1	0.000	0.001	0.001	0,000568	
5	P1103	283-4-01MSDO	0.7991		1	0.003	0.049	0.046	0.0383	77%
5		-1-01			1	0.006	0.008	0.000	0.00141	20.003
7	J	pH Requirement: I				0.006		6.047 to pH adjustm	0,0392	78%

pH Requirement:	Method 7196A (2 $\pm$ 0.5) E Samples filtered prior to pH adjustment
ICV/CCV spiked with	Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment $0.25$ ml of $924.10(5100)$ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)
	6 0.00

MS/MSD spiked with 0.05 ml of 924 + 0.8241/00 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm) m m)

LCS spiked with 0.2 ml of		1 ^ 50 ml of pH a	adjusted DI Water	(T.V.=0.04  pp)
Verification Standard Spiked 0, 2	ml of	<u>U</u> ↑ 10	ml of sample (T.	V.= <u>0.03</u> pp

Comments:		
		1
Prepared By:	Date/Time:	8/24/1
Analyzed By:	Date/Time:	8/29/11
Reviewed By:	Date:	1/38

Cr6LIQ.xls

#### Hexavalent Chromium (Liquids) Columbia pag 2062 94 Analytical Services\* Method EPA 7196A Run#: 259445 Stock#: 524-08291102 TV=1088M EN: 2/29/12 Prep Run#: Conc. H2SO4 Lot#: EMD 49284 EXP: 11/20/14 CVICCV#: 534-10191001 TIV=100PPM EXP. 3/2012 Coloring Reagent Ref#: 524-0822/104 ENF: 9/20/11 NΑ 0.05/50 0.25/50 0.5/50 Working Curve: Prev Dilution Corr. Coeff. 0.00 0.05 Concentration mg/L 0.999969372 Absorbance (a. 540 nm 0.061 0-000 0.012 Corrected Abs. Absorbance QA/QC - %R Sample Results -(minus bkg.) Sample # Vol.(mL) Dilution Bkg. (a): 540nm mg/L1/103983-1/01 USD 0,048 0.006 0.054 0.040 -2.01 0,005 0,005 0.000+0,000271 -2.011 So.03RPM 0,040 0.000 0,0291 0.006 0.004 0,003 L0:003 0.00141 0.004 0.004 0.000 10.003 - D. DOG271 0.000 0.000 0-000 20.003 O. OSPPM 1030/ 0.062 0.062 0.000 0. COCI-0.00027 0.00 O 0-000 20,003 pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment ICV/CCV spiked with 0.25 ml of 524-10/5/001 50 ml of pH adjusted DI WATER (T.V.= 0.65 ppm) MS/MSD spiked with 0.05 ml of 524-6 \$34/102 $\uparrow$ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

Verification Standard Spiked 6,3 ml of  $\sqrt{}$ 

Comments:

Prepared By:

Analyzed By: \_\_\_\_

Reviewed By:

7//\_\_\_\_

Cr6LIO.xls

(a)/105

Date/Time:

Date/Time:

Date:

16 of 23

 $\uparrow$  10 ml of sample (T.V.= 0.0  $\stackrel{?}{\sim}$  ppm)

40	
10/16/10	524-10061001 25133pp Stock for 03
	0.05 ml Pyridine-4-carboxaldehyde, Alfa Aesaw
111	10/46598 ;Exp: 8/11/p) up to 500 ml w/ DI Water.
	EXP: 10/20/10
- // /	1011 011 227 0 00 00 00 00 00
10/6/10	524-10061002 25133996 Jalla for 0:
- SV	0.05 ml Pyridine-4-carboxaldehyde TEI
	( <i>IGINC</i> ; Exp: 8/10/12) up to 500 ml w/ Dl Water.
1	EXP: 10/20/10
· · · · · · · · · · · · · · · · · · ·	524-1006/003 MBTH SO/M
Inthation	Ser 1000/00 110111 20/11
10/01/0	0.5000 g MBTH (Aldrich 54646EK; Exp. 8/7/14) up
<b>S</b> /	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMD 44784; CX 11/2.
	EXP: 10/7/10
:	
10/15/10	524-10151001 (Not ICV Starle
10	Purchased 100 PPM Cr6+
M	FICCA (penical (n Cut No 295-16
	500ml Plastic
,	
	LOT# 10/0177 EXP: 3/20/2
P	EXT , 3/30/3
10/1	COULDING MANAGERALA
10/15/10	524-10151002 500PM NOZ Stock
	Purchased
· Our	RCCA Chemical W (ut No: 5444-5-4
×	RCA Chemical Co Cut No: 5444.5-4 LOT# 1010271 120 ml almber 9/45
	The state of the control of the cont

04 524-0221101 1:142504 MD 49284; PXP: 11/20 Y TO 250M DI OMPLETELY 524-022/1102 0.2500g 1,5-0ipheny/carbohydradide (EMD 107 47/03; EXP: 1/30/13) 7 50 ml W/ACLTON (EML) WP: 3/21/11 0.1NH2504 534-0238/101 5.6 ml ane 1/2 Dy (one 49284 exp 11/20/14) WIDIHZO ex1: 2/28/12 -0228/102 1001 19/1 CN6+ Inorganic Ventures CGCR (6)1-1 125 ml Clay Glass D2-CR03040 12x1: 3/1/2012

GC NH3 FILLING SOLI ga 4/26/11 come 1+2504 (OMD 49 284; Extilla DISSOLVE 1.68757 NN-DIMERLY J-D Dr. Whit Fulca 1363386 13408 204 dilute 1:1 H2504 (524-042611 64; OXF: 4/36/12

524-05791103 ICO2 PCR Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM) 305641 exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 45/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49184 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas. QP: 5/24/11 CAT. No. BOH 5010-500 mL CAT # BN45058-500m

•	brakes ()	
	8/2/11	524-0822/104 Cr6+ Coloring Leagh 0,25g 1,5-0; preny (carbohy drazede (JThyrer; JOS 64 EXP. 6/15/15) I GIN N/ Actore (EMP.
	S	0,25g 1,5-Dipheny Carbohy drazide (JThyker: Jos 64
		exp. 6/15/15) 9 50 ml N/ Acetone (EMD)
 		60+47154D EXP: 9/24/12)
PD -		EXP: 9/22/11
ļ	jj	
7 -	8/20/11	524-08221105 1000PM SOZ STOCK
-	SW	
16		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to -j 00 ml w/ DI Water.
-		EXP: 9/5/11
		-14 . 1/9/11
-	almuli	524-08221106 100 pm S03 IW/Ca
* -	o o o li	-)201 0000 1000 1000 1000 305 500/10
	- W	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
1		EXP: 9/5/4
1	i 1	
	8/23/11	524-08231101 1000pplo Cr 6 5 Stock
	Si	0./ ml 524-02281102 (1001 ppm (r6+; exp: 3/1/12)
V		1 100ml W/ PHADJUSTED DI (PH=9.426)
glas E		ar: 3/1/12
1: 1 <sup>-11</sup>		
-27 to 1	8/23/11	524-0823/102 250pp Crot Ia/Cal
		0.25 0.3 mL Ref 5.24.101.5.701 (1) 10 exp: 3/2012 up to 100 mL with pH adjusted (pH = 6.142 ( , )) decreased DL Water
		ine with pir adjusted (pir- 4426), degassed by water.
•		EXP: 9/6/1

5.00g Suffani lamide (5/4); lor# J32618; EXP): 1/6/16 DISSONEDIN SOME CONC HC/ EMD 49260; EXP. 2/7/16) 1 500 ml W/DT HZ 08241102 NODA W/M 0.2500g N-1-Naphthylethylenediamine dihydrachloris (JTBAKER H22587, EXP: 10/19/14) 1 250 MW/DT EXP: 2/24/12 524-08291101 01N H2SOY 5.6Ml COME H2SOY (EMD 4984; EXP: 11/20/14 1 24 N/DI H2O 0.1N HZ SOY EXP: 8/29/12 1 100 ml 2/DIH20 EXP: 3/28/12



# 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103283

JPL GW Mon 3Q11 / 100006114 Project:

# **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.

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.

Service Request: P1103283



DETAIL SUMMARY REPORT

Client: Battelle

JPL GW Mon 3Q11 / 100006114

Project ID:

Date Received: Time Received:	8/29/2011 15:52					
			Date	Time	96A - Cr6	
Client Sample ID	Lab Code	Matrix	Collected	Collected	71	
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

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

Page \_\_ of |

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

Temperature °C	Time:	Date:			* - 3		١,	1	nature)	Récegyed-by. (Signature)	Time:	a.ye.comma	Date:			Relinquished by: (Signature)	Rein
Cooler / Blank / Ice / No Ice	言いたり	Lase // Cill	A	7	KIN	F	F		nature)	Heceived by: (Signature)	time:/552	2	Dane C	100	アラスをデ	Helinquished by: (Signature)	Hein
	Time: SOL	Date: (417)()			ذا	`			nature)	Received by: (Signature)	L		oa.	R		Relinquished by: (Signature)	Relii
		Type:	Type:		98 / No	/ No uired Ye	red Yes _ / J rec	MHL required Yes / No MDL / PQL / J required Yes / No	<u> </u>	charge	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	lidation Pack cified)	Tier III - (Data Validation Tier V - (client specified)	Tier II	ot specified)	Tier I - (Results/Default if not specified) Tier II - (Results + QC)	Tier
Project Requirements (MRLs, QAPP)															select	Report Tier Levels - please select	Rep
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				ļ	<u> </u>	  X	<u> </u>				***************************************	8	2/v   2020	4/29		w - 24 - 3	MAW
CEVEL IV QC					<u> </u>	×					દ	858	=	8/18		w - 24 - 4	× V
Remarks					CR	625 🖂 8	TPH FC	TPH Dies	624 □ 8 TPH Gas BTEX 80	Number of Containers	Matrix 2	Time Collected	Date T Collected Coll	Laboratory Da ID Number Colle	La ID	Client Sample ID	Clie
					VL	270C □ (		sel 8015B	8015B (	O organics (			Sampler (Frint & Sign)	₩ Çan	( Heporting	Email Address for Result Reporting	LL 3
						Subco		□ (S	]		104	Damo/o	_	614)458-10614	(6/4)	619726-7311	0
6 Asc Acid					7	ontrac		ubcor			MIN COCHING AND	1000 C			Fax	ne	Phone
					196	ted)		ntracted		WOKINS STE	285651 / BATTELLE	782.621	7. C 2	2	CONNER	Project Manager  DAUID C	Pro
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eserva			Preservative Code	reserva		-				% = □		TO CANACO		)		BATTELLE	
CAS COITACT.		les	Method and/or Analytes	od and		Analysis	≱					Project Name		ng Information	ess (Reporti	Company Name & Address (Reporting Information)	S
3 2		Standard	to bay -	(%0%)	5 Day	(35%)	4 Day	(%)0	3 Day	рау (75%)	1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard	1		Fax (805) 526-7270	Fax (8		
CAS/Project Meno		741147	e circle	) pleas	narges	(Surci	Days	siness	e in Bu	around Tim	Requested Turnaround Time in Business Days (Surcharges) please circle	- Bec	61	Phone (805) 526-7161	Phone	An Employee - Owned Company	An 6

Temperature

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# Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103283

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	

# 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

# **Sample Acceptance Check Form**

	Battelle					Work order:	P1103283			
		3Q11 / 100006114								
• `	s) received on:				Date opened:			SSTAF		
		samples received by CAS.		-	· ·	_			cation of	
compliance	or nonconformity.	Thermal preservation and p	H will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S	SOP.  Yes	<u>No</u>	N/A
1	Were sample	containers properly n	narked with cl	ient sample ID	<b>)</b> ?			X		
2	_	supplied by CAS?		<b>r</b>				X		
3		ontainers arrive in go	od condition?					X		
4	_	<b>f-custody</b> papers used		?				×		
5		ontainer labels and/or			pers?			X		
6		volume received adequ						X		
7	_	vithin specified holdin	•					X		
8	-	mperature (thermal p	_	of cooler at rec	eipt adhered	to?		X		
-		perature: ° C Blan			1	Wet 1	[ce			
9	Was a <b>trip bla</b>	•		. – -						X
10	_	seals on outside of co	ooler/Box?						X	
	•	Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int									X
	Were custody	seals on outside of sa	mple containe	r?					X	
	·	Location of seal(s)?	=				Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int									X
11	Do container	rs have appropriate <b>pr</b>	eservation, ac	ccording to me	ethod/SOP or	Client specified i	nformation?			X
	Is there a clie	nt indication that the s	submitted sam	ples are <b>pH</b> p	reserved?	_				X
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clien	t/method/SOP require	that the analy	st check the sa	ample pH and	d <u>if necessary</u> alte	r it?			X
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain n	noisture?							X
13	Badges:	Are the badges p		d and intact?						X
		Are dual bed bads			ly capped and	d intact?				X
T -1.	Cl- ID	Container	D	D	A 354- 3	WOA Hardenson	D !-	4 / D	4	
Lab	Sample ID	Description Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		Commei	ervation nts	
P1103283	3-001.01	125mL Plastic NP								
P1103283		125mL Plastic NP								
P1103283		125mL Plastic NP								
P1103283 P1103283		125mL Plastic NP								
F1103263	5-003.01	125mL Plastic NP								
Explain	any discrepanci	ies: (include lab sample	ID numbers):							
•										

 $RSK - MEEPP, HCL \ (pH\!<\!\!2); RSK - CO2, \ (pH \ 5\text{-}8); \ Sulfur \ (pH\!>\!\!4)$ 

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

Units: mg/L (ppm)

Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-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	

Kam Rya Date : Approved By

Report By:SAnderson

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:

ICCBMDL/120594

Date: 8/30/11

Karu Rya

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:

CCV1A/120594

Date

WBMIX.XLT

Karu Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q11

Project Number : Sample Matrix :

100006114 WATER Service Request :

P1103283

Date Collected: NA
Date Received: NA

: NA

Date Extracted : Date Analyzed :

08/29/11

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

mg/L (ppm)

Lab Code:

P1103283-LCS

Units: Basis:

NA .

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By K

ate: \$\big|\_2

Report By: SAnderson

11 of 22

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

Lab Code:

P1103283-001MS

P1103283-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	POL	Spike MS	Level	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes	
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0392	0.0400	78	80	73-119	2		

Report By:SAnderson



		,	pH Run		.og			
Service Reques	st #(s):	<i></i>	91103982		P110308	3	41.00	
Time: 0830								
Sample	V	WR lot#	Exp.		Slope		Prep.	Run #
pH 2 Buffer	524-	05201101	12/2012		$\supset$	$\cap$		
pH 4 Buffer		-0520/102		-	1 998	/	Ru	n#
pH 7 Buffer		-04271102A			10.0	O		
pH 10 Buffer	524-	04261102	9/30/201	þ.	J			
pH in liquid: (1) 90-	40B, (2)	9040C <b>pH in</b> 9	solid: (3) 90450	С,	(4) 9045D (Note m	ethod nun	nber in column labele	ed # below )
pH adjustment:(5)	7196A,	(6) 7199 (Note	method # In col	um	n labeled # )			
Sample	#	рН	Temp. <sup>0</sup> C		Sample	#	рН	Temp. °C
pH 2.000	5	1,999	20.40		P1103283-5.01	5	1.905	15.10
pH 4.000	II	3.991	20,50		DH 2.000	5	2,030	21.4
pH 7.000		7,003	20.80					in Property of
pH 10.000		10,000	20.90					Letters in the control of the contro
7.0= 7.38 CAP, 31. Ref#: 524-05201103	20,3	7.388	21.10					CTOOL AND A CTUORING
BI		2.077	21.80		. \			000 st. market 1900 st. market
04 2.000	J	2002	20.30					
TIME STOCK		21-						SALIBATE DICTOR
DIL 2 M1)	5	2024	21.50		\			unic attended of
11103282-1.0)	F	1.80,0	1360		\.			, , , , , , , , , , , , , , , , , , ,
1-2.01		1,882	13.70		2	<	mo not	-11186)
1-3.01		1.846	13.60			7	my in	70800
1 -4.01	1	1.873	13.90					on and group ge
P1103283-1.01		1.917	14.40		\.			and the second s
1-2.01		2099	14,73					The same of the sa
-3.01		1.887	14.80					No.
11-401	U	1.880	1480			1		and the second s
	₹719	6A: Diluted/	Conc H <sub>2</sub> S0 <sub>4</sub> €	$\mathcal{U}_{\mathcal{U}}$	D 49284EXP:	11/2	WIY	
pH Adjustments:	<sup>'</sup> 719	9 <b>A</b> : Diluted I	NaOH		EXP:			
* Soil or Solid pre	ep: 1:1	(wt:vol) with	DI water: ** S	Sa	mples received	past r	ecommended	hold time.
			ion changed:					
Note: ATC probe		_	_			on is n	ot necessary.	
						da		
Analyst:	<	- CV	<del>,, ,,,,</del>	-	Date:	0/29	11,	
Reviewer:		KK		_	Date:	_8/3	0/11	pH.XLS

Columbia Analytical Services

Method EPA 7196A

rvice Request#(s):	P110328Z		
ock#: 584-082	191102 TiV=	IOPPINERP:	2/39/12

VICCV#: 574-10/5/001 T.V=1008/M PRP: 3/2012 Conc. H2SO4 Lot#:

Chromium (Liquids)

7196A

Run#: \_\_\_\_\_ 259445

Prep Run#: \_\_\_\_\_ Conc. H<sub>2</sub>SO<sub>4</sub> Lot#: \_\_\_\_ EMP 49284 EAP: 11/20/14

Coloring Reagent Ref#: \_\_\_\_\_ 524-08.321104 CXP: 9/22/11

Working Curve:

Prep Dilution	NA NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	् ५०००४५८४
bsorbance (a. 540 nm	0.000	0.012	0,061	0.119	0.79770137

10 M V 100 M V		Sample #	Sample Vol.(mI	Dilution	~ \	Absorbance @: 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
	ICB		10ml		0.000	0.000	0.000 -	0.000271	20.003
	IW	0.05PPM			V 0.000	0,063	0.063	0.0526	105%
3	MB				V 0.000	0,001	0.001	0.000568	20.003
1	165	0.04PFM			0.000	0.050	0.050	0.0417	164 %
5	P11032	82-1.01			V 0.000	0.004	0.000	0.66141	20.003
5		1 -1.01 VS 0.03	pp.		1 0.000	0.033	0.031	0.0257	86%
7		-2.01		_	0.002	0.004	0.007	0.00141	20.603
3		- 3,01	and the same of th	_	2.002	0.005	0.003	0.00225	20.003
9		-3.01 MS v.os	Pm		0.003	0.053	0.051	0.0425	85224
		-3.01 MSD			10.002	0.055	0.053	0.0442	889 SAD
1		-4.01			0.003	0.004	0.001	0.000568	10.003
2	V	-4.0/MS0.00	Am	_	V0.003	0.049	0.046	0.0383	77%
3	COVI	v J		_	10,000	0.063	0.063	0.0526	105%
1.	[(6)		WAS Company and a second secon		1 0.000	0.001	0.001	0.000568	
5	P1103	283-4-01MSDO	0.79911		10.003	0.049	0.046	0.0383	77%
5		T-1-01	Non-EDISCO-ASCAL		10.006	0.008	0.000	0.00141	20.003
7	V	1 -1.01 MSONS		_	10,006		6.047	0,0392	780)
		pH Requirement:	Method 7	196A (2 ±	0.5) E Samples	filtered prior	to pH adjustm	ent	

					s ultered prior to pH ad	
	ICV/CCV spiked with	0125 ml of 9	924-10:510010	50 ml of	pH adjusted DI WATEI	R(T.V.= 0.05  ppm)
	MS/MSD spiked with	h 0.05 ml of 2	24-08291100	210 ml of	pH adjusted sample (T.	V = 0.05  ppm)
	LCS spiked wi	th 0.2 ml of_			pH adjusted DI Water (	
Verific	cation-Standard Spiked	0.3	ml of $\bigcup$		↑ 10 ml of sample (T.V	$C = \underline{C.03}_{ppm}$

	Comments:	·
No. of Concession,		
	Prepared By:	Date/Time
ì	Analyzed By:	Date/Time
	Payriawad Py	Date

:	8/26/11 (a /709	>
:	8/29/11/01720	Ì
	1/30/11	-
	7 7 7	

#### Hexavalent Chromium (Liquids) Columbia pag 2062 94 Analytical Services\* Method EPA 7196A Run#: 259445 Stock#: 524-08291102 TV=1088M EN: 2/29/12 Prep Run#: Conc. H2SO4 Lot#: EMD 49284 EXP: 11/20/14 CVICCV#: 534-10191001 TIV=100PPM EXP. 3/2012 Coloring Reagent Ref#: 524-0822/104 ENF: 9/20/11 NΑ 0.05/50 0.25/50 0.5/50 Working Curve: Prev Dilution Corr. Coeff. 0.00 0.05 Concentration mg/L 0.999969372 Absorbance (a. 540 nm 0.061 0-000 0.012 Corrected Abs. Absorbance QA/QC - %R Sample Results -(minus bkg.) Sample # Vol.(mL) Dilution Bkg. (a): 540nm mg/L1/103983-1/01 USD 0,048 0.006 0.054 0.040 -2.01 0,005 0,005 0.000+0,000271 -2.011 So.03RPM 0,040 0.005 0.035 0,0291 0.006 0.004 0,003 L0:003 0.00141 0.004 0.004 0.000 10.003 - D. DOG271 0.000 0.000 0-000 20.003 O. OSPPM 1030/ 0.062 0.000 0.062 0. COCI-0.00027 0.00 O 0-000 20,003 pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment ICV/CCV spiked with 0.25 ml of 524-10/5/001 50 ml of pH adjusted DI WATER (T.V.= 0.65 ppm) MS/MSD spiked with 0.05 ml of 524-6 \$34/102 $\uparrow$ 10 ml of pH adjusted sample (T.V.= 0.05 ppm) Verification Standard Spiked 6,3 ml of $\sqrt{}$ $\uparrow$ 10 ml of sample (T.V.= 0.0 $\stackrel{?}{\sim}$ ppm)

(a/705

Date/Time:

Date/Time:

Date:

Comments:

Prepared By:

Analyzed By: \_\_\_\_

Reviewed By:

40	
10/6/10	524-10061001 25133pp Stock for 03
	205 ml Pyridine-4-carbovaldehyde Alfa Aesar
	10/46598 ;Exp: 8/11/12) up to 500 ml w/ D1
	EXP: 10/20/10
10/6/10	524-10061002 25133996 Jalla For 0:
5	0.05 ml Pyridine-4-carboxaldenydc TCI
	( <u>ICIIW</u> ; Exp: 8/10/12) up to 500 ml w/ Dl Water.
	EXP: 10/20/10
:	524-1006/003 MBTH Soly
10/6/10	0.5000 a MRTH (Aldrich SWELLEY : Evn. 8/7/14 ) un
50	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44J84; EXT 1/2
	EXP: 10/7/10
In living	COLL 1015 (00) Cht radeal a to
10/12/10	524-10151001 (NOT ICV CON STUCK)
20	FICA (bennical Ch Cut No 295-16
	500ml Plastic
,	
	LOT# 10/0177 EXP: 3/20/2
Interto	524-10151002 500PM NOZ Stock
10/15/10	14.00 1.00 JULY 3001111102 SICK
XV	RCA Chimical Co (ut No: 54445-4
×	RCA Chemical Co Cut No: 5444.5-4 LOT# 1010271 120 ml amber 9/455

04 524-0221101 1:1H2504 MD 49284; EXP: 11/20 Y TO 250M DI OMPLETERY 524-022//102 0.2500g 1,5-0ipheny/Carbohydradide (EMD 107 47/03; EXP: 1/30/13) 7 50 ml W/ACETONI (EM) LOT # 471540; EXP: 9/34/12). EXP: 3/21/11 0.1WHZSOY 594-0228/101 5.6 ml and 11/20/ (om 49284 Oxp 11/20/14) WIDIHZO ext: 2/28/12 -0228/102 1001 19/1 ON6+ Inorganic Ventures CGCR (6)1-1 125 ml Clay Glass D2-CR03040 128: 3/1/2012

GC NH3 FILLING SOLI ga 4/26/11 come 1+2504 (OMD 49 284; Extilla DISSOLVE 1.68757 NN-DIMERLY J-D Dr. Whit Fulca 1363386 13408 204 in world Sulfusic Solp and dilute 1:1 H2504 (524-042611 64; OXF: 4/36/12

524-05791103 ICO2 PCR Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EN) exp: 6/15/15) in 100 mL Methanol (B&J AD806 exp: 45/13/16). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49184 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas. QP: 5/24/11 CAT. No. BOH 5010-500 mL CAT # BN45058-500m

•	70	
	8/2/11	524-0822/104 Cr6+ Coloring Leagh 0,25g 1,5-0; preny(carbohydrazode (JT byker; JOS 64 EXP. 6/15/15) 9 GON W/ Actoré (EMD.
	S	0,25g 1,5-Dipreny Carbohy drazide (JThyrer; Jos 64
		exp. 6/15/15) 9 50 ml N/ Acetone (EMD.
,		60+47154DEXP, 9/24/12)
<b>I</b> II		EXP: 9/22/11
7	8/22/11	524-08221105 1000PM Soz stock
LÉ.	Sa	0 1501 No2CO2 (FC D-1 - 1 - //////////
-		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to ———————————————————————————————————
SE CONTRACTOR		EXP: 9/5/11
. –	8/22/11	524-08221106 100 pm 503 Ia/ca
	<b>W</b>	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
1		EXP: 9/5/11
-		
	8/23/11	524-08231101 1000pplo (r & Stock
	Sh	0./ ml 524-02281102 (1001 ppm (r6+) exp: 3/1/12
je-		1 100ml w/ flf ADJUSTED DI (flt=9.426)
1 1: 1:		ar: 3/1/12
	8/23/11	524-0823/102 250pp Oft Ia/Ca
	- D	$\frac{0.25}{0.3}$ mL Ref 5.2440(5/00) ( $\frac{0.1}{10}$ exp: $\frac{3}{2012}$ up to 100 mL with pH adjusted (pH= $\frac{9.426}{0.426}$ ), degassed DI Water.
		EXP: 9/10/11

5.00g Suffani lamide (5/4); lamide (5/4); los# J32618; los# J32618; EMD 49260; EXP. 2/7/16) 1 500 ml W/DT HZ S24-08241102 NODA W/M 0.2500g N-1-Naphthylethylenediamine dihydrachloris (JTBAKER H22587, EXP: 10/19/14) 1 250 MW/DT EXP: 2/24/12 524-08291101 0.1N H2SOY 5.6 ml Conc H2SOY (MD 49284; EXP: 11/20/14 1 24 N/DI H2O 0-1N HZ SOY EXP: 8/29/12 1 100 ml 2/DIH20 EXP: 3/28/12



# 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

The Juderta

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103297

JPL GW Mon 3Q11 / 100006114 Project:

# **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.

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.

Service Request: P1103297



DETAIL SUMMARY REPORT

Client:

Battelle

Project ID:

JPL GW Mon 3Q11 / 100006114

Troject ID.	JI L G W MON 3	Q11 / 100	7000114		
Date Received:	8/30/2011				
Time Received:	14:35				
					9
					Cr6
			Doto	Time	- A96
CII + C 1 ID		3.6	Date	Time	67
Client Sample ID	Lab Code	Matrix	Collected	Collected	7
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

## Page / of /

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

Simi Valley, California 93065 Phone (805) 526-7161 Fax (805) 526-7161			Vater	So	Soil - C	Chain of	Cust	of Custody Record & Analytical Service Request	ecor	\ ∞ 0	\naly	tical	Serv	ce B	edne		Page /	of
10 bay (100%) 2 Day (15%) 5 Day (15%) 5 Day (15%) 10 Day . Standard   10 Day (100%) 2 Day (15%) 10 Day . Standard   10 Day . Day		2655 Park Cente Simi Valley, Calit Phone (805) 526	er Drive, S ifornia 930 '6-7161	Boussess	equested T	urnaround	Time in E	usiness	Days (St	ırcharge	es) pleas	e circle				AS Projec	FNo.	
Triple   Project   Rame   Project   Particle   Project   Particle   Project   Particle		Fax (805) 526-7	7270		Day (100%	) 2 Day (75	%) 3 Da	7 (%09) 7	4 Day (35	%) 5 De	ıy (25%)	10 Day	Standa	ą		AS Confac	27.7	
11.0	any Name & Address (F	Reporting Informs	ation)	Project Nam	je je				Analı	/sis Met	hod and	/or Anal	rtes					
10   10   10   10   10   10   10   10	Telle		ļ	70,07	1000						Preserva	tive Code		-			Preserva	ıtive Key
100   100		MUE C-	Soz	075.01	2010.0		1			0	1	+	$\downarrow$	_	1	1	0	None
1	, Diego, CH			Project Nun	2017 2017 70 (2)		_ s	ntracted)				**************************************				HIVELETONIS - 100 AUGUST	- 0 0	HCL HNO3
Secondary   Seco	1 .			P.O. # / Billir	ig Informatic	on 11/2		ted) Subcoi		(9)		CANANZA NA SARA					o 4	NaOH
Second   Column   Column   Supplement   Su		-02-		からない。		311C		ntrac ) 🗆 (	SI	b1·							co C	Zn Acetate
Sampler Print & Sign Print & Si		ax 4)458-661		Columb		72201 43201	sətsnəg/	(Subcoi	N/DB sc	<del>上</del> )							9 /	Asc Acid Other
Start   Time	ddress for Result Rep		Sampler (	(Print & Sign)	1/4		8015B □	91 8015B □	tile Organi	1		<del></del>					A STATE OF THE STA	
\$\frac{\partial \text{\$\frac{1}{2}}{\partial \text{\$\frac{1}{2}}{\partin	ample ID		Date Collected		Matrix	Number of Containers	624 ☐ 82 TPH Gas	PPH Diese TPH Diese	Semi-Vola	CR					-		Веш	arks
7 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	4-		1991	5480	3	-				X							9197972 C. (1975) 24-44 (1975)	
7   10   10   10   10   10   10   10	-  -  -		30/11	4060						X								
Ther III - (Data Validation Package) 10% Surcharge MRL required Yes / No Ter V - (client specified) MDL / PQL / J required Yes / No Type:	7		11/08	8260	K					X					-0	7	上でだって	
Tier III - (Data Validation Package) 10% Surcharge MRL required Yes / No Tier V - (client specified)															·			
Tier III - (Data Validation Package) 10% Surcharge												***************************************				ENVERTINE CONTRACTOR		
Tier III - (Data Validation Package) 10% Surcharge   MRL required Yes / No   EDD required Yes / No   Tier V - (client specified)																		
Tier III - (Data Validation Package) 10% Surcharge   MRL required Yes / No   Tiny   MDL / PQL / J required Yes / No   Type:   Date:   MAL																		
Tier III - (Data Validation Package) 10% Surcharge   MRL required Yes / No   EDD required Yes / No   Type:																		
Tier III - (Data Validation Package) 10% Surcharge   MRL required Yes / No   EDD required Yes / No   Tier V - (client specified)   MDL / PQL / J required Yes / No   Type:   Date: Machine Wash   Machine																		
Tier III - (Data Validation Package) 10% Surcharge																		
Tier V - (client specified)		·																
Tier III - (Data Validation Package) 10% Surcharge MRL required Yes / No Tier V - (client specified) MDL / PQL / J required Yes / No Tier V - (client specified) MDL / PQL / J required Yes / No Tier W - (client specified) MDL / PQL / J required Yes / No Type:																		
Tier III - (Data Validation Package) 10% Surcharge	,																	-
Tier V - (client specified)												OTTO LOUIS ON A						
Tier III - (Data Validation Package) 10% Surcharge MRL required Yes / No EDD required Yes / No Type: MDL / PQL / J required Yes / No Type: MDL / PQL / J required Yes / No Type: MDL / PQL / J required Yes / No Type: MUL / PQL / PQL / J required Yes / No Type: MUL / PQL								_		-			_	-	_	_		
Date 12 / Tring // Proceived by: (Signature)   Day // MV//W	esults/Default if not speciesults + QC)		ier III - (Da: ier V - (clien	ta Validation Part specified)	аскаде) 10%	Surcharge	22	ARL require	ed Yes / Nc	d Yes / Nc		EDD requ	red Yes /	9		Project Requ	uirements (M	RLs, QAPP)
	d bv: (Signature)	, h.,	7	Date:		Received by:	(Signature)	1000	MAN				Date (K)	* / i.d Time	Kires		(	

Cooler / Blank / Ice// No Ice

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

Temperature \_

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

Page 1 of

CAS Project No

Columbia Analytical

An Employee - Owned Company

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

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key HN03 NaOH HCL Remarks CAS Contact: EDD required Yes / No Type: Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard Analysis Method and/or Analytes Preservative Code MRL required Yes / No MDL / PQL / J required Yes / No (961t) 20 厶 0 Semi-Volatile Organics GC/MS 

625 □ 8270C □ (Subcontracted) TPH FC 🗆 8015M (Subcontracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B [ Subcontracted) TPH Gas 8015B □ BTEX 8021B □ □ 809Z8 □ setsnegyxO ATTN: GERALD TOMPKINS 1028h Ha Number of Containers JPL. GW.MON. 3Q11 Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) 285651 /BMTTELLE SOS KING AUE P.O. # / Billing Information Project Number 9609879 Matrix 3 COLUMBUS 3 Project Name Sampler (Print & Sign) Collected 150, 81052V Date Collected 30/11 = 30/11 3990 OID TOWN AVE. C-205 30/1 1019) 726 - 7511 (64) 458-6614 Company Name & Address (Reporting Information) 0 92110 Laboratory ID Number Email Address for Result Reporting Ť. CONNER Tier 1 - (Results/Default if not specified) SAW DIGGO, CA Report Tier Levels - please select 4 EB-06-8/301 Tier II - (Results + QC) BATTENE DAVID ( Project Manager Client Sample ID ~ 381 WW <u>≥</u>

Cooler / Blank / Jce / No Ice

Time:

Date: 8/2/11

Received by: (Signature)

005.kmj Time: (425

16 SA

Received by (Signature)

Time:

Date:

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signatur

Date // Date:

Temperature

## Columbia Analytical Services, Inc. Analytical Services 265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

## Columbia Analytical Services, Inc.

Client: Battelle Service Request: P1103297

JPL GW Mon 3Q11/100006114 Project:

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	

2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

## **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103297			
Project:	JPL GW Mon	3Q11 / 100006114								
Sample(s	s) received on:	8/30/11		. ]	Date opened:	8/30/11	by:	SSTAI	PLES	
Note: This fe	orm is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody sea	ls is strictly mea	nt to indicate presence	absence and not a	s an indic	cation of	
compliance of	or nonconformity.	Thermal preservation and p	oH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S		No	NI/A
1	Wasa samenla			:41- IT	<b>N</b> 0			<u>Yes</u> ⊠	<u>No</u> □	<u>N/A</u>
	_	containers properly r	narked with ci	ient sampie il	) !					
		supplied by CAS?	1 111 0					$\boxtimes$		
	-	ontainers arrive in go						X		
4	Were chain-o	<b>f-custody</b> papers used	and filled out	?				X		
5	Did sample c	<b>ontainer labels</b> and/o	r tags agree wi	ith custody pap	pers?			X		
6	Was sample v	volume received adequ	uate for analys	is?				X		
7	Are samples v	vithin specified holdir	ng times?					X		
8	Was proper te	emperature (thermal )	preservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Ten	nperature: ° C Blan	k Temperature	e: 2° C		Wet 1	[ce			
9	Was a <b>trip bl</b> a	ank received?								X
10	Were custody	seals on outside of co	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int									X
		seals on outside of sa	mple containe	r?					X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	re and date included?					beaming Era.			×
	Were seals int									X
11		rs have appropriate <b>p</b> a	ecoryotion a	ecording to me	othod/SOP or	Client specified i	nformation?	$\boxtimes$		
11		nt indication that the		•		Chefit specified i	inormation:			$\boxtimes$
		ials checked for prese			reserved.					$\boxtimes$
					1 77	1	**0			
		nt/method/SOP require	•		ampie pH and	1 <u>if necessary</u> afte	r 1t ?			$\boxtimes$
12	Tubes:	Are the tubes cap	•	?						X
		Do they contain r	noisture?							X
13	Badges:	Are the badges p	roperly capped	d and intact?						X
		Are dual bed bad	ges separated a	and individual	ly capped and	l intact?				X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recein	ot / Pres	ervation	
	•	Description	pH *	pН	pН	(Presence/Absence)		Comme		
P1103297	-001.01	125mL Plastic NP								
P1103297	-002.01	125mL Plastic NP								
P1103297	-003.01	125mL Plastic NP								
P1103297		125mL Plastic NP								
P1103297		125mL Plastic NP								
P1103297		125mL Plastic NP								
P1103297	-007.01	125mL Plastic NP								
		<u> </u>	<u> </u>		<u> </u>	<u> </u>				
Explain	any discrepanc	ies: (include lab sample	ID numbers):							

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

## Analytical Report

Client:

Battelle

Service Request: P1103297 **Date Collected:** 08/30/11

**Project Name:** Project Number: 100006114

JPL GW Mon 3Q11

**Date Received:** 08/30/11

Sample Matrix:

WATER

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-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	

Karu Rya

Report By:SAnderson

QA/QC Report

Client:

Battelle

Service Request: P1103297

Project:

JPL GW Mon 3Q11 / 100006114

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:

ICCBMDL/120594

Karu Rya

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)

	True		Percent	Acceptance
Sample Name	Value	Result	Recovery	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:

CCV1A/120594

Date

Date: <u>8 / 2</u>

Karer Rya

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

08/30/11 Date Analyzed:

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name: Lab Code:

Laboratory Control Sample

P1103297-LCS

mg/L (ppm) Units:

Basis: NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0421	105	90-110	

Report By:SAnderson

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

Lab Code:

P1103297-001MS

P1103297-001DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL		Level DMS	Sample Result	•		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0396	0.0396	79	79	73-119	<2	



<b>.</b>			pH Run	Log				, .
Service Reques	t #(s):		P11032	97				
Time: 1415	-				,	-		
Sample	V	WR lot#	Exp.		Slope		Prep	.Run#
pH 2 Buffer	234-6	5201101	12/2012	1		$\overline{)}$	-	
pH 4 Buffer	524-6	15201102	9/30/12	1/	98.2	0/	Rı	u <b>n</b> #
pH 7 Buffer		04271102A	3/30/3	1>	10:1	10	·	
pH 10 Buffer	524	-04261102	9/30/12	1				
pH in liquid: (1) 904 pH adjustment:(5)		· ·				ethod num	nber in column labei	led # below )
Sample	#	рН	Temp. ⁰C	6	Sample	#	рН	Temp. <sup>0</sup> C
pH 2.000	5	1.987	22.70					
pH 4.000		3.990	22.70					
pH 7.000		7.002	22.70					
pH 10.000		10.005	22,20					
Ref#: \$24-09201103		7.386	23,2°					
DZ		2.042	22.10					\$1.4 m
PH 2.000	V	2.002	22.70					
7MC: 1535		1 .	í					
DH 2.000	5	1.985	21.50					
P1103297-1.01	<u> </u>	1,850	14,50				:	
1-2.01		1,738	14.80		\ Da		, '	
-3.01		1.709	15.3°		7	MA	t . [	
-4.01		1.940	15,20			· ·	Uslex	The second secon
-5.01		1.934	14.90					
-6.01		2.069	15.00					
<i>────────────────────────────────────</i>		1.957	15.50					V CONTRACTOR OF THE CONTRACTOR
DH 2.000	V	1.996	21.00					
pH Adjustments:	X 719	<b>6A</b> : Diluted/0	Conc H <sub>2</sub> SO <sub>4</sub> _	ampi	14284 EXP:	u ·	20/14	
		99A: Diluted N	NaOH		EXP:		i /	
Comments:			· · · · · · · · · · · · · · · · · · ·				*****	
* Soil or Solid pre	n. 1.1	(wt:yol) with	Diwator: ** 9	amnia	e received	nact r	acommandas	l hold time
			on changed:	î	1	pastit	200111111011000	a nota unic.
Note: ATC probe			-			on is n	ot necessarv	
- 13.7, 1. <b>3</b> p. 330					z., Janoarati		l	•
Analyst:		15V,			Date:	8/2	2/1/	-
Reviewer:		KK			Date:	_8B	1///	pH.XLS

Columbia	
Columbia Analytical	Services*

(case)	Analytical Servic	<b>:es</b> ™ M	lethod E	PA	7196A				93
ervic	e Request#(s):	110320	17,	_	Run#:	25962	a		
tock#	: 524-08291102 Tive	10 PM ENP.	2/39/1	)	Prep Run#:		<u> </u>	mark	al i
CV/C	CCV#: 524-10/5/100/ 7	V=100/fire E.	Xf: 3/20	12	Conc. H <sub>2</sub> SC	O4 Lot#:	10009384	21100	114
				<del></del>			524-082		
	Working Curve:	<del>}</del>	ep Dilution ration mg/L		NA 0.00	0.05/50 0.01	0.25/50	0.5/50 0.1	Corr. Coeff.
	<i>t</i>		e (a) 540 nm		0.000	0.011	0.058	0,117	0.99998013
				\			Corrected		
		Sample	PE	.\		Absorbance	Abs.	Results -	QA/QC - %R
	Sample #	Sample Vol.(mL)	Dilution	-/	Bkg.	@ 540nm	(minus bkg.)	mg/L	/ RPD
	TGS	10 M		1	0.000	0,000	0.000	0.000344	20,003
	TCU 0.05PPM				0.000	0,060	0.060	0.0515	103%
	MB			V	0.000	0.000	0.000	0.000344	
	LCS 0.048PM	,		1/	0.000	0.049	0.049	0,0421	105%
5 F	110 3297-1.01			/	0,004	0.005	0.001	0.00120	10.003
5	11.0/450.	OSAPM		V	0.004	0.050	0.046	0,0396	79%711
7	1.01MSD	T		V	0.004	0.050	0.046	0.0396	79% SA
8	- 2,01	To a second	_	/	0.000	0.003	0.001	0.00/20	10.003
9	-2.0/18	0.438911			0.002	0.032	0.030	0.6259	56%
0	-3,01			1	0.002	0.002	0.000	0.000344	1 10.00
1	-4.01	TILLOGO DE CALLON	····	/	0.005	0.006	0.001	0.00190	20.003
2	1 -5.0				0.004	0.005	0.001	0.00120	20.003
	(N) 0.05PM			1	0.000	0.060	0.000	0.0015	1030/0
	P1103297-6.01		_	/	0.006	0.006	0,000	1	
5	-7.01		_	1	0.000	0.000	0.000	T/	1
5	MAY 2 0.05PPM	Principle of the state of the s		V	0.000	0.061	0.061	0,0524	105%
7	Chr	1		i/	0.000	0,000	0.000	0.000344	40.003
	pH Requirement:	Method 71	$96A (2 \pm 6)$	0.5)	* Samples	filtered prior	to pH adjustm	ent	
	ICV/CCV spiked with _ MS/MSD spiked w								)
	LCS spiked w						Imple (1. v.= 0.0 I Water (T.V.=		
Veri	fication Standard Spiked	03	ml of	T			mple (T.V.= $\underline{\emptyset}$		
:	Comments:					***************************************			
_							Start	Sa 8/30	0/11
	epared By:					Date/Time:	8/30/11 E/20/11	(4) 11.12m	1990
	aiyzed By:					Date/Time: Date:	0/2/1/,,	<u>CV /605</u>	
	1.000003.					a. ette.			

. 40	
10/6/10	524-10061001 25133pps Stock for 03
	Q.05 ml Pyridine-4-carboxaldehyde Alfa Aesaw
100	10/46598 ;Exp: 8/11/p) up to 500 ml w/DI Water.
100 Marie 1971 1981 1971 1971 1971 1971 1971 1971	
	EXP: 10/20/10
10/1/10	5014 1000 1000 2-122001 TOURIL- 11:
10/0/10	524-1006/002 25/33/16 Jala For 02
- SV	0.05 ml Pyridine-4-carboxaldenyde TEL
	( <i>IGINC</i> ; Exp: \$/10//2) up to 500 ml w/Dl Water.
	EXP: 10/20/10
,	524-1006/003 MBTH Soly
10/1/10	
	0.5000 g MBTH (Aldrich <u>54646EK</u> ; Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44784; CN 1/2
	EXP: 10/7/10
	coul la vercasi Cht codani a la
10/5/10	524-10151001 (Not ICV Starle
	Purchased 100PM Cret
	FICCA Chensical (b) Cut No 2095-16
	500ml /19.5tic
,	LOT# 1010177
Birgian American America de Propinsi anno America de America de Propinsi de America de America de America de Propinsi de Propinsi de America de Propinsi de America de Propinsi de Propins	LOT# 10/0177 EXP: 3/20/2
and the second s	2011
- Interla	524-10151002 500PM NOZ Stock
10/15/10	001111100
- AV	MV Chastel
	RCA Chemical Co (ut No: 5444.5-4 LOT+ 1010271 120 ml amber 9/45)
	LOT# 1010271 120 ml amber 9455
	) 1:

04 524-0221101 1:1H2504 ( EMD 49284; AP: 11/20 LY TO 250M D.I. COO/ 11102 0.2500g 1,5-0ipheny/Carbohydrazide (EMD) 107 47103i EXP: 1/30/13) 1 50 ml W/ACLTONI (EMD) LOT # 47154D; EXP: 9/34/12). EXP: 3/21/11 504-0228/101 0.17/HZSOY 5.6 ml Core 11/204 (como 49284 exp 11/20/14) WIDIAZO al: 3/25/12 -0228/102 1001 19/1 ON6+ Inorganic Ventures CGCR (6)1-1 125 ml Clay Glass LOT# D2-CRO3040 DXP: 3/1/2012

00 NH3 FILLING gay/26/11 1:1 H 2504 (524-642611 64; 028: 4/36)

		J L
6/9/1	SAY-05791103 ICO2 PCR	
- Marie	Dissolve 0.50 1.5-Diphenylogrhohydroxida TIBAKER	
100	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM 37564)  exp: 6/15/15) in 100 mL Methanol (B&J 40806 exp:5/13/16).	
	Add to 1 L Volumetric flask containing 500 ml. DI water 4	
	5.6 mL conc. H2SO4 (EMD 44184 exp: 1/20/14). Bring up to volume w/ DI H2O; mix and degas.	
_	QP: 5/24/11	
6/20/11	524-0520 1101 pH 2,000 BUFFER	
-1/4/1	purchasa	
- H	pur chuse	
	BOH CAT. No. BOH 5010-500 ML	
	101# 1101225	
-	EXP:12/2012	!
-		
- halis	334-05201102 pH 4.000 huffen	
7/2010		
	furchasel	/
	JT Byker CAT # 5657-01 500m	
	60T# J36503	
produced and a single frame and an extension of the single control	EXP: 9/30/10	IN STANSON AUTOMOTORY WAS STANSON
	$\mathcal{L}^{\prime\prime}$ . $\mathcal{L}^{\prime\prime}$	
5/20/11	524-05201103 pl+ 1.8 by 1962	
	Francis a Cell	
	BDI+ CAT # BDH5058-500mL	
	BUTT GITTE DIGITIONS ROME	
	LOT# 1103360/	
Name of the last o	DX: 3/2013	
Ĺá	·	Î

70	
862/11	524-0822/104 Cr 6+ Colorine feach 0,25g 1,5-0; preny(carbohydrazide (JT Byker; JOS 64 EXP. 6/15/15) 9 GIN W/ Acetore (EMD.
	0,25g 1,5-Dipheny Carbohy drazide (Ji Biker: Jos 64
	Exp. 6/15/15) 9 50 ml W/ Acetone (EMD)
P The second sec	(0747154D EXP: 9/24/12)
	EXP: 9/22/11
8/22/11	524-08221105 1000PM SOZ Stock
So	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ Dl Water.
	RO: C/-1
ngam,  ngam,  ngam,  ngam,  diana dikanasani da magamana pagadang app Masan alahid mgililal	EXP: 9/5/11
also Li	524-08221106 100 pm 503 Ia/ca
8/0/11	524-08221106 100 pm 503 Ia/ca
	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
	EXP: 9/5/4
8/23/11	524-08231101 1000 pplo Gr 6+ Stock
Si	0/ml 524-02281102 (1001 ppm (v6+; exp: 3/1/12)
· · ·	1 100ml W/ PHADJUSTED DI (PH=9.426)
	OXP: 3/1/12
ř.	
8/23/1	534-0823/102 250pp Orbit Id/Cal
	0.25 0.5 mL Ref 5.26/10/15/00/ (W) 10 exp: 3/20/2 up to 100 mL with pH adjusted (pH= 5/12/2) decreased DI Water
	ine with pir adjusted (pir- 1/4/06), degassed by water.
	EXP: 9/6/11



## 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

ne Inderta

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103317

JPL GW Mon 3Q11 / 100006114 Project:

## **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.



Client:

Battelle

Project ID:

JPL GW Mon 3Q11 / 100006114

Date Received: Time Received: 8/31/2011 12:00

DETAIL SUMMARY REPORT

Service Request: P1103317

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

## Columbia Analytical Services \*\*\*

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

Page . of \_

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

An Employee - Owned Company Flax (805) 526-7270	1 Day (100%) 2 Day	1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard  Analysis Method and/or Analytes	Day - Standard  CAS Contact:
Company Name & Address (Reporting Information)  BHTYE//E	Project Name	) in any or o	Code Preservative Key
3990 OID TOWN AVE. C-205	JPL. GW. MON. 3011	0	
SAN DIEGO, CA 92110	Project Number 08/14		NO3
	12 4 400 0 XXX		3 H2SO4
*	. <del>.</del> .	PH Ga ted) Subco d)	
DAVID CONNER	288681 /BATTELLE	BID tracte (1) (S acted S ted)	5 Zn Acetate
Phone Fax	SOS KING AVE.	ates [] 8021Eubcon 015B	
(619) 726-7311 (614) 458-6614	ABUS, O	C/MS Lygen TBE I (Su Let 8 (Sub les Cubec	
Email Address for Result Reporting Sampler	Sampler (Print & Sign)	DOX BEI MT 15BE w Lev 15M Drgan EJ(Si	
Warden &	De A Don of	260B : 8018 21B [	
Cilent Sample ID Laboratory Date ID Number Collected	Time Matrix Number of Collected Matrix Containers	Volatile C 624 [] E TPH Gas BTEX 80 TPH Die TPH Die TPH FC Semi-Vol 625 [] E	Hemarks
mw-22-3 8/31/w	0853 W	X	
MW -22 - 2 8/31/"	99/5	X	
MW-22-1 8/31/11		X	
Ç,	1 Co 2560	X	Carpros 8/00
			1
Report Tier Levels - piease seject			
led)	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:
Relinquished by: (Signature)		Received by: (Signature) (1) However the control of	CA 2837 1/11 1/26
Relinquished by, (Signature)	Date Time Received	Received by Signature)  Received by Signature)	Days / Times Cooler / Blank Aude / No toe

Tomperatuse

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## Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103317

JPL GW Mon 3Q11/100006114 Project:

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	

Printed 9/1/11 11:01 Intenal Chain of Guztody Summary Page 1 of 1

## 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

## **Sample Acceptance Check Form**

	Battelle					Work order:	P1103317			
		3Q11 / 100006114				0/01/11		~~~.		
	s) received on:			•	Date opened:		by:	SSTAF		
		samples received by CAS.			-	_			ation of	
compliance of	or nonconformity.	Thermal preservation and p	H will only be ev	aruated either at tr	ie request of the	chent and/or as require	ea by the method/	Yes	<u>No</u>	N/A
1	Were sample	containers properly n	narked with cl	ient sample ID	?			X		
2	Container(s) s	supplied by CAS?						X		
3	Did sample co	ontainers arrive in go	od condition?					X		
4	Were chain-o	f-custody papers used	and filled out	?				X		
5	Did sample co	ontainer labels and/or	tags agree wi	ith custody pap	pers?			X		
6	Was sample v	volume received adequ	ate for analys	is?				X		
7	Are samples v	vithin specified holdin	g times?					X		
8	Was proper te	<b>emperature</b> (thermal p	reservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Tem	nperature: ° C Blan	k Temperature	e: 2° C		Wet 1	Ice			
9	Was a <b>trip bla</b>	ank received?							X	
10	Were custody	seals on outside of co	ooler/Box?							X
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int	act?								X
	Were custody	seals on outside of sar	mple containe	r?					X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	e and date included?								X
	Were seals int									X
11		rs have appropriate <b>pr</b> nt indication that the s		•		Client specified i	nformation?			$\boxtimes$
		ials checked for prese								$\overline{\mathbf{x}}$
		nt/method/SOP require			ample pH and	d if necessary alte	r it?			$\boxtimes$
	Tubes:	Are the tubes cap	•		ampro pri uno	a <u>ir necessary</u> une	1 10.			$\boxtimes$
12	20000	Do they contain n	-	•						$\boxtimes$
13	Badges:	Are the badges p		d and intact?						X
13	Duages	Are dual bed badg			v canned and	l intact?				×
			*							
Lab S	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		pt / Prese Commer		
P1103317	7-001.01	125mL Plastic NP								
P1103317		125mL Plastic NP								
P1103317		125mL Plastic NP								
P1103317	<u>/-004.01</u>	125mL Plastic NP								
Explain	any discrepanci	ies: (include lab sample	ID numbers):							
								_	_	· <u> </u>

RSK - MEEPP, HCL (pH < 2); RSK - CO2, (pH 5-8); Sulfur (pH > 4)

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

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	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	

Kau Rya

QA/QC Report

Client:

Battelle

Service Request: P1103317

Project:

JPL GW Mon 3Q11 / 100006114

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:

ICCBMDL/120594

Date:

Karu Rya

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:

CCV1A/120594

Date:

10 of 21

Kam Rya

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q11

Project Number : Sample Matrix : 100006114 WATER Service Request :

P1103317

Date Collected:

: NA : NA

Date Received :
Date Extracted :

NA

Date Analyzed :

08/31/11

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P1103317-LCS

Units:

mg/L (ppm)

Basis:

NA

Test Notes:

						CAS	
						Percent	
						Recovery	
	Prep	Analysis			Percent	Acceptance	Result
Analyte	Method	Method	True Value	Result	Recovery	Limits	Notes
Characian Hayayalant	None	7196A	0.0400	0.0402	101	90-110	
Chromium, Hexavalent	None	/ 1 7 U/ <b>\</b>	0.0400	0.0402	101	20-11U	

Approved By

Karu Rya

Data

9/1/11

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

P1103317-001MS

P1103317-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0393	0.0402	79	80	73-119	2	

Karu Rya Date : 9/1/1/

Report By:SAnderson

12 of 21



ime: 1725								<b>–</b> "		
ample		WR lot #	Exp.		Slope			Prep.Run #		
H 2 Buffer H 4 Buffer		05201101	12/2012	1) p	01	71/		tun#		
H 7 Buffer		15201102 04271102A	2/2013	1 A	971	101		CUI IIT		
H 10 Buffer	524-	04261102	9/30/12	1) 3/4	131/1		<u></u>			
H in liquid: (1) 90		•	1			ethoa numbe	er in column lab	eled # below )		
H adjustment:(5)	7196A,(	(6) 7199 (Note r	method # In colu	mn labele	d#)					
Sample	#	рН	Temp. ⁰C	Sai	nple	#	рН	Temp. °(		
pH 2.000	5	2.000	21.50							
pH 4.000	T	4.000	21.80							
pH 7.000		7,011	21.90		1					
pH 10.000		10.000	22,20		-					
рн 10.000 <i>щ-052 р403 го</i> ef#: <sub>т.V=7</sub> ,86	1:3/2013	7.394	22.30							
)T		1.902	22.30							
11 2.000	$\top 1$	1.997	21.30							
TIME: 131	5	1:								
14 2.000	5	2.021	22,50	2						
1103317-11		2.089	17,50			V				
-1-20		1867	17.30				\			
1 -3.0		1890	17,20				<del>\</del>			
V-4.01		2/129	17.20							
14 0 07/1	+ + ,	1027	72 20				$\overline{}$	1		
11) J. 000	W	0000	70.0		!					
$\overline{}$							nt all	<del>\                                    </del>		
					<u> </u>	Max 1	DI MX			
Ι Λ -!: 4 4	+ 740	CA. 511		10.16.49	( EVD:	(2				
H Adjustments	4					,	<u>01</u> 19			
Comments:		SA. Diluteu i	NaOH		·					
O O I I I I I I I I I I I I I I I I I I						··. · · · · · · · · · · · · · · · · · ·				
Call or Calld or	on: 1:1	() * ( * ) ( ) ( ) ( ) ( ) ( ) ( )	Diwater ** C	amples	one is read	nact roc	ommondo	d hold time		
Soil or Solid pr			on changed: _	~ /	a 1	past 1 <del>e</del> 0	ommende	a noid time.		
Date Duli	cis all	a minig soluti	on changed	$-9\sqrt{x}$	//!/					

Columbia	
Columbia Analytical	Services*

) Ana	ilytical Service	5 <sup>™</sup> N	Iethod E	$\mathbf{P}\mathbf{A}$	7196A				70
ervice Reque	est#(s): P110		,		Run#:	25979	34		
ock#: 524	-08291102 TVS		:2/39/6	2_	Prep Run#			660 11	baler
	804-1015/001 TO				Conc. H <sub>2</sub> SC	) <sub>4</sub> Lot#:	MD 4928	4 EXPINIS	mily
	<i>y y</i>		· () · Sp	אבטין	Coloring R	eagent Ref#:	524-082211	04 EXP:	9/02/11
	Working Curve:	Pr	rep Dilution	ĺ	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
		Concent	ration mg/L		0.00	0.01	0.05	0.1	0.9999388
		Absorbance	e @ 540 nm		0.000	0.011	0,058	0.114	0.1171535
			1	\			Corrected		·
			\P_	.\		4.7	Abs.	70. 1.	0.400 8/10
٠.	Earnle #	Sample	Dilution	~/	Bkg.	Absorbance @ 540nm	(minus bkg.)	Results - mg/L	QA/QC - %R   RPD
1	Sample #		Dilution				<u> </u>	1	
160	) /	10M1		1	0.000	0.000	0.000	-0.00000 705	
IOV	0.05/AM			1	0.000	0.061	0.061	0.0533	107%
NB			-	مرا	0.000	0.000	0.000	-0.00000705	20.003
415	0.04PPM			0	0.000		0.046	0,0402	101%
A103	317-101			./	0,000	0.000	0.000	-0.00000 705	
	1818 X 1.01 898	My		رما	0,000		0.045	0.0393	79007
	- 1.0/ MS/	1		ر	0.000	0.046	0.046		80% 5
-	-2.01				0.000	0.002		0.00174	10.003
	0.514/0	31 PM			0.000	0.030	0.030	0.0262	7
	-201	9,770		1	0.001		0.002	0.00174	
	401			/	0.000	0.003	m 1000		0.00
mill	ON Olm			-	0.000	0.000		0.0000705 0.0933	
00/2	0.05Pm	<del>                                     </del>			f	0.061	0.06/	61	
(0)		0		V	0.000	0.000	0,000	- O. 0000070	10.00
		-010	\		10	in-			
		SIM	\$ 1/10X		HU				
·		01							
	pH Requirement:	Mothod 71	064 (2 +	0.51	* Camples	filtared naior	to pH adjustm	ont	
ICV	/CCV spiked with $\mathcal{Q}_i$	26 ml of	SOA (# ± ) Enduinten		$\frac{1}{v_{\star}}$ 50 ml of $v_{\star}$	Medica prior	to per aujustii.	.em V = 0.05 nnm	ì.
IC V	MS/MSD spiked with								,
	LCS spiked with			i voj			I Water (T.V.= 0.		
erification	-Standard Spiked	0,3	ml of	<del>1.</del>	· · ·		mple $(T.V.= 0)$		
	omments:		/-			,	Y /=		
							; <i>Ī</i>		
Prepared By:					Date/Time:	8/3/10	(W. 1334	7	
Analyzed By:					Date/Time: 8/31/1/ (W 1350				
Reviewed By:					Date:	8/3///1			
	:					•	1 1111		

40	
10/6/10	524-10061001 25133pps Stock for 03
	Q.05 ml Pyridine-4-carboxaldehyde Alfa Aesau
Ja	10/46598 ;Exp: 8/11/2) up to 500 ml w/Dl
	Water.
	EXP: 10/20/10
11	2011 201 202 D 2010 - doub 0:
10/6/10	524-10061002 25133pps Jakev for 0:
	0.05 ml Pyridine-4-carboxaldehydic TEI
	(
1	EXP: 10/20/10
	PAT . 10/ - 5/10
1	524-1006/003 MBTH SO/M
10/1/10	534-1006/003 MBTH SO/17
10/0/10	0.5000 g MBTH (Aldrich 546466K; Exp. 8/7/14) up
	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44784; CN 11/2
	EXP: 10/7/10
10/15/10	524-10151001 OF ICV/COV Stock
	Purchased 100 PPM Cr6+
W	Fire Charical Co Cit No 295-11
	7114 Marica W 47 100 2013-16
	500ml 1/9stic
·	LOT# 10/0177
i.	LOT# 10/0177 EXP: 3/20/2
· / /	
10/15/10	524-10/5/1002 500PM NOZ Stock
- + / /	Durch ACPO
. XV	RVCH Chimical Co lut No: 5444-5-4
v	RCA Chemical Co (ut No: 5444-5-4

54 524-0221101 1:1H2504 DY (EMD 49284; AP: 11/20) NLY TO 250MP DI. (00/ 524-022//102 0.2500g 1,5-0ipheny/Carbohydrazide (EMD 107 47103i EXP: 1/30/13) 7 50 Ml W/ACETOXI (EMD) LOT # 47154D; EXP: 9/34/12). EXP: 3/21/11 524-0228/101 0.1NH2504 5.6 ml and 117 Dy (omo 49284 Oxp 11/20/14) W/DI 470 EXP: 3/28/12 0228/102 1001 19/1 CN6+ CGCR (6)1-1 Inovganic Ventures 125 ml Clear Glass LOT# D2-CR03040 121: 3/1/2012

50 9/30/12 NH3 FILLING SIN 924/26/11 1:1 HZSC LET COOL 6.25ml come H2SOY (OND 49284; Oxf: 11/21) DI HZO. DISSOUTE 1.6875g NN Dimetly of - Fulla 1363386 B408 Zog in wolld Sulfasic Solp and dilute 1:1 H2504 (524-042611 64; OXP: 4/20) 5/25/11

Spi	584-05791103 ICO2 PCR
h	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM JOSCH)
00	exp: 6/15/16) 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 49284 exp. 1/20/14) Bring
	up to volume w/ DI H2O; mix and degas.
	EXP: 5/24/11
water and the second se	,
5/20/11	524-05201101 PH 2,000 BUFFER
- 90	Purchasa
	BOH CAT. No. BOH 5010-500 mL
	101# 1101225
	EXP:12/2012
•	
5/20/11	394-05201102 pH 4.000 BURGER
Ch	hirchasel
0	JT Baker CAT # 5657-01 500mC
	10T# J36503
production of the control of the con	EXP: 9/30/10
	-
6/22/11	524-05201103 dt 7.38 BUTTER
10	Luch weld
0	BDH CAT # BDHS058-500m L
	107# 1103360/
	m: 3/2013
The second secon	KA' S/CT
Be-	

	70	
	8/22/11	524-0822/104 Cr6+ Colorine Penals
	S	524-0822/104 Cr6+ Colorine feagle 0,25g 1,5-0ipreny/Carbohydrazide (Ji Byrer; Jos 64 Exp. 6/15/15) I DW W/ Acetore (EMD)
		exp. 6/15/15) 9 50 ml w/ Acetone (EMD:
-		COT 47/54D EXP: 9/24/12)
		EXP: 9/22/11
<b>H</b>	8/22/11	524-08221105 1000PM Soz stock
	, Sa	
1 j		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 1 00 ml w/ DI Water.
-		
		exp: 9/5/11
-	4/20/11	524-08221106 100 pm 503 IW/Ca
		- 100 ppv 303 svo/(0)
21-44 21-44		0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
1,		EXP: 9/5/4
	alaatu	Carlo De Carrol Carlo Ca
	8/33/11	324-08231101 1000pp W Stock
	$\mathcal{A}^{\circ}$	0/ml 524-0228/102 (100/ppm(x07) Exp. 3/1/12
13 E 21		1 1001 w/ f/7 1050 STO W (fit= 2,426).
r 1" .		
	8/23/11	524-0823/102 250pp Orbit Id/Cal
		0.25 <del>0.3</del> mL Ref 524+015/001 (W 10 exp: 3/2012 up to 100
-		mL with pH adjusted (pH= 9.426), degassed DI Water.
		ENT ( 911, 1()



## 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

me Inderta

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103365

JPL GW Mon 3Q11 / 100006114 Project:

## **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.



Client: Battelle

Project ID: JPL GW Mon 3Q11 / 100006114

Date Received: Time Received: 9/1/2011 13:21

DETAIL SUMMARY REPORT

Service Request: P1103365

			Date	Time	964
Client Sample ID	Lab Code	Matrix	Collected	Collected	175
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.



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

Page of

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

Temperature // "C		AND THE PROPERTY OF THE PROPER	***************************************			4		-	ţ	***************************************		HAMISSA HAMISSA HAMISSA HAMISSA SA
Cooler / Blank / June / No lice	ř	2	$\mathbb{N}$		A	Hecewed by (Signature)	Hecewood b		Dated MIN			Heinquisned by (Signature)
				Char		Reguined by: (Signature)	Received b	575 Class	Toppe			Relinquished by: (Signature)
	EDD required Yes / No Type:		1 Yes / No	Yes / No J required	MRL required Yes / No MDL / PQL / J required Yes / No	22	s Surcharge _	ackage) 10%	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	Tier III - (Data Validation Tier V - (client specified)	cified)	Tier II - (Hesults/Default if not specified) Tier II - (Results + QC)
Project Requirements (MRLs, QAPP)											ct	Report Tier Levels - please select
				-								
									- Shirt Shir			
				nga mangada katanga da								,
Bara, popers Brank			×				1	Eng.	1049	9/1/11	4	5B-08-08/01/11
			<b>4000-4000</b>									
CEVEL IV OC			X					⊱	1058	9/1/1	J)	MW - 21-1
ms/msp			X		***************************************		7		1031	9/1/"	Į Ą	mw-21-2
			X						4560	9/11/1	7	MW-21-3
			X				_		0933	9/1/11	7	MW-21-4
LEVEL IX QC			Χ					€	<i>CB//</i>	9///	<b>3</b>	MW-21-5
Remarks			CR	Semi-Vola 625 🔝 8	TPH Dies	Volatile O 624 ⊜ 8 TPH Gas	Number of Containers	Matrix 0	Time Collected	Date Collected	Laboratory 1D Number	Client Sample ID
			ΔĻ		el 8015B el Low Le	60BE C 8015BE			Sampler (Print & Sign)	Sampler (Prin	porting	Email Address for Result Reporting
Ç			(		⊜ (Si vel 8	C/MS xyger	43201	15,6	COLUMBUS,		4199-854(119)	619)726-7311 (
6 Asc Acid			<u>[</u> ]		ubcor 015B	ates [	AND JOMPHINS		202		Fax	Phone
4 NaOH 5 Zn Acetate			96)		tracted	i TPH	BATE//E	285 651 / BATT	785.651		Ch_	DAVID CONNER
					) cont	Gas	Cart.	T-090	20, " 02			
			24 <b></b>		racted	[.]		1500	POROS	indonismāk ministrato (	+ 92110	SAN OFFED, CA
HO None			c		1)		120	Ther	Droject Nis	C-205	AVE.	2980 010 town
eserva	6	Preservative Code	,				۲ ۲ ۲	TO CIN MON ROLL	トライ	****		BATTEILE
YOU COLLEGE:		Method and/or Analytes		Analysis				ne	Project Name	nation)	Reporting Inform	Company Name & Address (Reporting Information)
CAS CONTACT		4 Day (10%) 3 Day (30%) 4 Day (30%) 3 Day (20%) 10 Day - Statitudio	(a)	Jay (SS	(50%) # (	3%) a Day	6) Z Day (7	1 Day (100)	<b>p</b> econarios v	<b>-727</b> 0	Fax (805) 526-7270	
CASDINECTAR CASDINECTAR		Requested Turnaround Time in Business Days (Surcharges) please circle	rcharge	ays (Su	usiness D	Time in B	Turnaround	Requested		26-7161	Phone (805) 526-7161	An Employee - Owned Company

# Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103365

JPL GW Mon 3Q11/100006114 Project:

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	
21103365-003.01					
	7196A	0/4/44	1220	OMO / OCTA DI EC	
		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					
11100000 000.01	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	

## 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

## **Sample Acceptance Check Form**

Project: JPL GW Mon 3Q11 / 100006114  Sample(s) received on: 9/1/11 Date opened: 9/1/11 by  Tote: This form is used for <u>all</u> samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence a compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the number of the client			No	<u>N/A</u> □				
This form is used for <u>all</u> samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence a compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the n  Were <b>sample containers</b> properly marked with client sample ID?  Container(s) <b>supplied by CAS</b> ?  Did <b>sample containers</b> arrive in good condition?	e and not	as an indi /SOP. Yes  X  X	No	<u>N/A</u> □				
1 Were <b>sample containers</b> properly marked with client sample ID? 2 Container(s) <b>supplied by CAS</b> ? 3 Did <b>sample containers</b> arrive in good condition?		✓SOP. <u>Yes</u>	<u>No</u> □ □	<u>N/A</u> □				
<ol> <li>Were sample containers properly marked with client sample ID?</li> <li>Container(s) supplied by CAS?</li> <li>Did sample containers arrive in good condition?</li> </ol>	e method	<u>Yes</u> ⊠						
<ul> <li>Container(s) supplied by CAS?</li> <li>Did sample containers arrive in good condition?</li> </ul>		X X X X						
<ul> <li>Container(s) supplied by CAS?</li> <li>Did sample containers arrive in good condition?</li> </ul>		X X						
3 Did <b>sample containers</b> arrive in good condition?		X						
		X						
A Were chain-of-custody naners used and filled out'?								
** *		IXI						
5 Did <b>sample container labels</b> and/or tags agree with custody papers?								
6 Was <b>sample volume</b> received adequate for analysis?		X						
7 Are samples within specified holding times?		X						
8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?		X						
Cooler Temperature: °C Blank Temperature: 2°C Wet Ice								
9 Was a <b>trip blank</b> received?				X				
Were <b>custody seals</b> on outside of cooler/Box?			X					
Location of seal(s)? Sealing	ng Lid?			X				
Were signature and date included?				X				
Were seals intact?				X				
Were custody seals on outside of sample container?			X					
Location of seal(s)?Sealing	ng Lid?			X				
Were signature and date included?								
Were seals intact?								
	otion?			$\boxtimes$				
Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information Is there a client indication that the submitted samples are <b>pH</b> preserved?	iation?			$\boxtimes$				
Were <u>VOA vials</u> checked for presence/absence of air bubbles?				$\boxtimes$				
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?				X				
12 <b>Tubes:</b> Are the tubes capped and intact?				X				
Do they contain moisture?				X				
13 <b>Badges:</b> Are the badges properly capped and intact?				X				
Are dual bed badges separated and individually capped and intact?				X				
Lab Sample ID Container Required Received Adjusted VOA Headspace	Recei	pt / Pres	ervatio	n				
Description pH * pH (Presence/Absence)		Comme		•				
21103365-001.01 125mL Plastic NP								
21103365-002.01 125mL Plastic NP								
P1103365-003.01 125mL Plastic NP								
21103365-004.01 125mL Plastic NP								
21103365-004.02 125mL Plastic NP								
21103365-005.01 125mL Plastic NP								
21103365-006.01 125mL Plastic NP								
Explain any discrepancies: (include lab sample ID numbers):								

 $RSK - MEEPP, HCL\ (pH{<}2); RSK - CO2, (pH\ 5{-}8); Sulfur\ (pH{>}4)$ 

## Analytical Report

Client:

Battelle

Service Request: P1103365

Project Name :

JPL GW Mon 3Q11

Project Number: 100006114

**Date Collected:** 09/01/11 **Date Received:** 09/01/11

Sample Matrix :

WATER

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-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 Kaw Rya Date: 9/2/11

Report By:SAnderson

8 of 21

QA/QC Report

Client:

Battelle

Batter

Service Request: P1103365

Project:

JPL GW Mon 3Q11 / 100006114

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
CCBI	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Date

WBMIX.XLT

Kam Rya

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
CCVI	0.0500	0.0515	103	90-110
CCV2	0.0500	0.0515	103	90-110

Approved By:

CCV1A/120594

Date

ate: 9/2

Karu Rya

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q11

Project Number: Sample Matrix:

100006114 WATER

Service Request:

P1103365

Date Collected: Date Received:

NA NA

Date Extracted: Date Analyzed:

NA 09/01/11

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

P1103365-LCS

Units:

mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

						CAS Percent	
	Prep	Analysis			Parcent	Recovery Acceptance	Result
Analyte	Method	Method	True Value	Result			Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0421	105	90-110	

Kam Rya Date:

Report By:SAnderson

11 of 21

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

P1103365-004MS

P1103365-004DMS

Units: mg/L (ppm)

Basis: NA

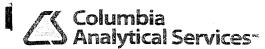
Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0404	0.0404	81	81	73-119	<1	

Kam Rya

Report By:SAnderson

12 of 21



		THE STATE OF	pH Run		og			
Service Reques	st #(s):		P110336	5				
Time: 072	6				<u> </u>			
Sample	,	WR lot#	Exp.	Γ	Slope	······································	Prep	.Run#
pH 2 Buffer		05201101	12/2012	ı				
pH 4 Buffer	524 -	05201102	91.3012		} 96.90A	)	R	un#
pH 7 Buffer	524-	0427110ZA	3/2013		7 40.7 K	)	_	
pH 10 Buffer	524-6	4261102	9/30/12	L	<u> </u>	·····		
pH in liquid: (1) 90	40B, (2)	9040C <b>pH in :</b>	solid: (3) 9045C	;, (	4) 9045D (Note me	ethod nur	mber in column labe	eled # below )
pH adjustment:(5)	7196A,	(6) 7199 (Note	method # In colu	m	n labeled # )			
Sample	#	рН	Temp. ⁰C		Sample	#	pН	Temp. ⁰C
pH 2.000	5	2.002	21.60					
pH 4.000		4.017	21.90					
pH 7.000		7.013	22.0"					
pH 10.000		9.998	22,2°			-		
Ref#:524-0520110	3	7.418	22.2°				SPARLI	of when
DI		1.987	20,60					
DH 2,000		2.005	21.60					
7IME: 1414	1 0	Sa						
042.000	5	2.026	12.80					
11103365-1.01	T	1,919	13.60					
1-2.01	-	1.879	13.00	1		· · · · · · · · · · · · · · · · · · ·		
-3.01		2.014	13,30	Ì				
-4.01		2.034	13.60					
1-501		1.987	13.70					
1 -6.01	1	1.802	14.40	l				
~ 4 7 MM	<del>      .   .   .   .   .   .   .   .   .</del>	2.030	22/10					<del></del>
pr 2.000		31030	DXIT					<del>                                     </del>
nii Adiyataa aata	/	ACA, Dilutadi		M.	LUMA GLÁ EVD.	111.	20/11/	
pH Adjustments:	-				EXP:		0/19	
Comments:			NaOH					
oommonie.	· ————						<u> </u>	
* Cail or Calid ar		(t.,	Diwatan ** C					d hald times
Soil or Solid pr					~ 1 ~ 1	pastr	есонинепае	a noia time.
			ion changed:		<del></del>	on is :	ot necessaria	
Note: ATC probe	⇒ used:	ineretore, te	emperature co	rΓ	ection calculati	on is r	iot necessar <u>y</u> //	∮.
Analyst		Sh	a.		Date:	C.	161/11	
Paviewer		1/1			Date:	$\overline{a}$	1111	

//	Columbia	
	Columbia Analytical	Services*

Concentration mg/L         0.00         0.01         0.05         0.1           Absorbance @ 540 nm         0.000         0.011         0.058         0.117	Corr. Coeff.  0.9999842  0.A/QC - %R
SQU-10 5 00   T.V=  UM   EXP. 45 13   Prep Run#:	Corr. Coeff.  0.9999842  0.A/QC - %R
V/CCV#: 694-10/15/00 / N = 100 LOM EXP; 3/30/3 Conc. H <sub>2</sub> SO <sub>4</sub> Lot#:	Corr. Coeff.  0.9999842  0.A/QC - %R
Coloring Reagent Ref#: 534 08,231104 EXP 71   Working Curve:   Prep Dilution   NA   0.05/50   0.25/50   0.5/50   0.000   0.01   0.05   0.1	Corr. Coeff.  ) 99% 842  )A/QC - %R  / RPD
Concentration mg/L         0.00         0.01         0.05         0.1           Absorbance @: 540 nm         0.000         0.011         0.058         0.117	).9999842 )A/QC - %R / RPD
Absorbance (a) 540 nm 0.000 0.011 0.05% 0.117	)A/QC - %R / RPD
Converted	)A/QC - %R / RPD
Corrected	/ RPD
	/ RPD
Sample Absorbance Abs. Results - Q	/ RPD
Manufic Trostronice Tresuits Q	
Sample ii 7 Oli (ME) Dilution   Oligo voidi	10,003
	105%
IN 0.05APM - 10,000 0.061 0.061 0.0534	
	10.003
215 0.049PM - \ 0.000 0.049 0.049 0.0421	105%
P1103365-1.01 - V0.003 2.005 0.000 0.000005	20,00
1-1.01VS0.03PPM - Va003 0.034 0.031 0.0268	89%
-2.01 - 1 0.006 0.006 0.000 0.000344	10,003
-3.01 - V 0.000 0.000 0.000 0.00344	
-4.01 - V 0.004 0.004 0.000 0.000344	J
-4.01 MST - X0.004 0.051 0.047 0.0404	81%7
-4.01 MSP - 10.004 0.051 0.047 0.0404 8	8/251
V -5,01 - 10.008 0,008 0.000 0.000344	10,00
101/ 0.05PM - 10,000 0.060 0.060 0.0515	103%
CUBI - V.0.000 0.000 0.000 0.000344.	20.00
9103365-6.01 - 10000 0,000 0.000 0.00344.	10.003
7/12 0.05 Pm - 1/0.000 0.060 0.060 0.0515	1030/2
C162 1 - 0.000 0.000 0.000 0.006344	10,00
pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment	
ICV/CCV spiked with 6.25 ml of 524-10157001 750 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)	
MS/MSD spiked with 0.05 ml of $\frac{621/68291/02}{10}$ \$\pm\$ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)	
LCS spiked with 0.2 ml of 1 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)	
rification Standard Spiked $0.2$ ml of $10$ ml of sample (T.V.= $0.03$ ppm)	
Comments:	
1 Sp. 91./11	
Prepared By:	
Analyzed By: Date/Time: 9/b/1/ (a) 1445	
Reviewed By: Date:	

40	
10/16/10	524-10061001 25133pps Stock for 03
GA .	All ACCION
	### ### ### ### ### ### ### ### #######
	EXP: 10/20/10
w /1 /	2011 - 2012 20 20 - 20 - 20 - 20 - 20 -
10/6/10	524-10061002 25133pp Jake Tool 600:
SV	0.05 ml Pyridine-4-carboxaldehyde TEI (IGINC; Exp: 8/10//2) up to 500 ml w/Dl
	Water.
	BXP: 10/20/10
	524-1006/003 MBTH SO/M
10/6/10	0.5000 g MBTH (Aldrich 54646EK; Exp. 8/7/14) up
5	to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 49J84; EN 11/2
	EXP: 10/7/10
1.1.2	Con an and Cot or day or for
10/15/10	524-10151001 (NOT ICV/COV STOCK)
X	Purchased 100PM Craf
	Frich Manical Co (4+ NO 2015-16
	100ML 1/95t7C
	LOT# 10/0177 EXP: 3/20/2
10/15/10	524-10151002 500PM NOZ Stock
	Turchased
	RCA Chemical Co Cut No: 5444.5-4 LOT# 1010271 120 ml amber 9/95
	LOT# 1010271 120 ml amber 9/95
	10/6/10 10/6/10 10/6/10 10/6/10

524-0221101 1:1H2504 END 49284; EXP: 11/2 pMIETELY 0.2500g 1,5-0ipheny/Curbohydrazide (EMD 107 47/03; EXP: 1/30/13) 7 50 Ml W/ACETOXI (EML) LOT # 47154D; EXP: 9/34/12). 534-0228/101 0.1NHZSOY 5.6 ml and 11284 (MD 49284 CXP 11/20/14) W/DI 420 EXP: 3/28/12 -0228/102 1001 19/1 ON6+ Inorganic Ventures CGCR (6)1-1 125 ml Clear Glass LOT# D2-CL03040 DXP: 3/1/2012

ل) ال 9/30/12 NH3 FILLING 4136/15 gay/26/11 6.25m (come HZSOY (OND 49284; Oxf: 11/20, 1.68757 N.N. Dimethy Fulla 1363386 13408 209 in cooled Suffusic Solp and dilute 1:147504 (524-047611 by; OXP: 4/26/12 512511

Sign	584-05191103 ICO2 PCR
h	Dissolve 0.5g 1,5-Diphenylcarbohydrazide (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 49184 exp; 1/20/4). Bring
	up to volume w/ DI H2O; mix and degas.
	EXP: 5/24/11
	,
5/20/11	524-05201101 PH 2,000 BUFFER
20	Pure hasa
- 00	BOH CAT. No. BOH 5010-500 mL
	101# 1101025
	EXP:12/2012
•	
5/20/11	594-05201102 pH 4.000 BUFFER
Ch	Turchasel
Do	JT Baker CAT # 5657-01 500mL
Angeles of the Angeles Angeles and the Angeles	10T# J36503
Mades and the second community of the second	EXP: 9/30/10
6/20/11	524-85201103 of 7.38 BUTTER
12	Purchased.
0	BOH CAT # BOHS058-500mL
	107# 1103361
	12: 3/2013
	611

	70	
	862/11	524-0822/104 Cr6+ Coloring Reagh
		0,25g 1,5-Dipheny Carbohy drazide (JThyrer: Jos 64
		0,25g 1,5-0ipheny/carbohydrazide (JThyrer; Jos 64 Exp. 6/15/15) I GON W/ Acetore (EMD)
		60+47154D EXP: 9/24/12)
II)		ex1: 9/22/11
	jj	
· · · · · · · · · · · · · · · · · · ·	8/22/11	524-08221105 1000PM Soz stock
	Sa	
1 1		0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 1 00 ml w/ Dl Water.
		EXP: 9/5/11
		214 . 1/9/11
	8/2/11	524-08221106 100 pm 503 Ia/ca
n 		
, j. 4		0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.
1		EXP: 9/5/4
-		
-	8/23/11	524-08231101 1000ppb ( 5tock
	Sh	0./ml 524-02281102 (1001 ppm Cr6+; exp: 3/1/12)
ļ		1 100ml w/ pH ADJUSTED DI (pH=9.426)
		ar: 3/1/12
ļ."		
	8/23/1	534-0823/102 250pp (Not Ja/Ca)
		0.25 0.3 mL Ref 524(10) 57001 (1) 10 exp: 3/2012 up to 100
		mL with pH adjusted (pH= 9.426), degassed DI Water.
٠		EXP: 9/6/11

5.00g Suffanilamide (57 baker; lot# 132618; 15.00g: 1/6/16 DISSONEDIN 50ml Conc HC/ EMD 49260; EXP. 2/7/16) 08241102 NODA SU 0.2500g N-1-Naphthylethylenediamine dihydrochloria (JT BAKER H22587, EXP: 10/19/14) 1 250 MW DT EXP: 2/24/12 0-1N HZ SOY 5:6 ml Conc H2SOY (MD 49984; EXP: 11/20, 1 24 N/OI H20 524-0228/102 (1000ppm Crist; EX1: 3/1 1 100 ml D/DIH20 EXP: 3/28/12



## 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103380

JPL GW Mon 3Q11 / 100006114 Project:

## **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.

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.



Client: Battelle

JPL GW Mon 3Q11 / 100006114

Date Received: Time Received:

Project ID:

9/2/2011 12:25

DETAIL SUMMARY REPORT

Service Request: P1103380

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	196A
Chefft Sample ID	Lab Code	Manix	Conected	Conected	
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# Analytical

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

Page \_

Phone (805) 526-7161

2655 Park Center Drive, Suite A

Phone Project Manager Company Name & Address (Reporting Information) Client Sample ID Email Address for Result Reporting (619) 726-7311 BUTTE-11E SAN DIEGO, CA BYTO OID TOWN AND. 0-205 ひゅりで Owned Company Services NC ならんないり 85K (H17) Simi Valley, California 93065 Fax (805) 526-7270 42112 Laboratory ID Number -6614 Sampler (Print & Sign Collected のなっという Date TPC.Gw.Mon.
Project Number Collected COlumbus, OH Project Name ALLY OCERATO COMPICING P.O. # / Billing Information 139.582 Time のものからたり 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 Matrix 1 BASTE!IG 4320 Number of Containers 300 Volatile O<del>rg</del>anics GC/MS Oxygenates [] TPH Gas () 8260B [] TPH Gas 8015B () BTEX 8021B 🖂 MTBE 8021B 🤇 TPH Diesel 8015B 🖂 (Subcontracted) TPH Diesel Low Level 8015B (Subcontracted) TPH FC (1 8015M (Subcontracted) Analysis Method and/or Analytes Semi-Volatile Organics GC/MS 625 El 8270C El (Subcontracted) (7-96) VI Preservative Code CASPIGEDINOK/ CAS Contact Preservative Key Øτ ₽. **(**1) N Remarks Asc Acid NaOH H2SO4 HNO3 Ĕ None Other Zn Acetate

MW -20

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11081

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# Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103380

JPL GW Mon 3Q11/100006114 Project:

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103380-001.01					
	7196A	0/0/11	1041	OMO / COTADI EG	
		9/2/11	1241	SMO / SSTAPLES	
		9/2/11 9/2/11	1241 1334	P-37 / SSTAPLES In Lab / SANDERSON	
		9/2/11	1553	P-37 / SANDERSON	
21102200 002 01					
P1103380-002.01	7196A				
	717011	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	0/0/11	10.41	CMO / CCTA DI EC	
		9/2/11	1241	SMO / SSTAPLES	
		9/2/11	1241	P-37 / SSTAPLES	
		9/2/11 9/2/11	1334 1553	In Lab / SANDERSON P-37 / SANDERSON	
		212122			
P1103380-007.01	7196A				
	/170A	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	

## 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

## **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103380			
Project:	JPL GW Mor	n 3Q11 / 100006114								
Sample(s	s) received on	: 9/2/11			Date opened:	9/2/11	by:	SSTAF	PLES	
Tote: This f	form is used for <u>al</u>	l samples received by CAS.	The use of this for	m for custody sea	ls is strictly mea	nt to indicate presence	absence and not a	s an indic	cation of	
ompliance of	or nonconformity	. Thermal preservation and	pH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S		Nia	NI/A
	***		1 1 11 1		<b>.</b>			Yes	No	<u>N/A</u>
1	_	e containers properly	marked with cl	ient sample IL	)?			X		
		supplied by CAS?						X		
3	Did sample o	<b>containers</b> arrive in go	ood condition?					X		
4	Were chain-	of-custody papers used	l and filled out	?				X		
5	Did sample o	container labels and/o	r tags agree wi	ith custody pap	pers?			X		
6	Was sample volume received adequate for analysis?							X		
7	Are samples	within specified holding	ng times?					X		
8	Was proper t	emperature (thermal	preservation) of	of cooler at rec	eipt adhered	to?		X		
		mperature: °C Blar	=		-	Wet 1	[ce			
9	Was a <b>trip blank</b> received?									X
10	Were <b>custody seals</b> on outside of cooler/Box?							X		
10	Location of seal(s)? Sealing Lid?									×
	Were signature and date included?								×	
	Were seals in									X
	Were custody seals on outside of sample container?								×	
	were custous		_				Caalina I : 49			$\boxtimes$
	***	Location of seal(s)?					Sealing Lid?			
	_	re and date included?								$\boxtimes$
	Were seals in					~				$\boxtimes$
11		ers have appropriate <b>p</b>		•		Client specified i	nformation?	$\boxtimes$		
		ent indication that the			reserved?					X
	Were <b>VOA</b>	vials checked for prese	ence/absence o	f air bubbles?						X
	Does the clie	nt/method/SOP require	e that the analy	st check the sa	ample pH and	d if necessary alte	r it?			X
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain i	noisture?							X
13	Badges:	Are the badges p	properly cappe	d and intact?						X
	_	Are dual bed bad	ges separated a	and individual	ly capped and	d intact?				X
T 1 (		G		D 1 1		WOL W.	ъ.	. /D		
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		t / Preso Commen		1
1103380	0-001.01	125mL Plastic NP								
1103380	-002.01	125mL Plastic NP								
1103380	-003.01	125mL Plastic NP								
1103380		125mL Plastic NP								
1103380		125mL Plastic NP								
1103380		125mL Plastic NP								
1103380	0-007.01	125mL Plastic NP								
		<u> </u>				l				
Explain	any discrepand	cies: (include lab sample	ID numbers):							

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

## 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

Units: mg/L (ppm)

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-20-5	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	

Kam Rya Approved By

Report By: SAnderson

8 of 21

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: ICCBMDL/120594

Kam Rya

Date: 9/10/11

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:

CCV1A/120594

Date: 9/4/1

Karu Rya

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

Units: mg/L (ppm)

Basis: NA

Test Notes:

				CAS			
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0396	99	90-110	

approved By Kall Rya Date: 9/0/1

Report By:SAnderson

11 of 21

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

P1103380-001MS

P1103380-001DMS

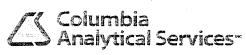
Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result		Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0379	0.0387	76	77	73-119	2	

Karu Rya



			pH Run	Lo	g			
Service Reques	st #(s):		P110335	30				
Time: 0725								
Sample	V	WR lot#	Exp.		Slope		Prep	.Run#
pH 2 Buffer	524-	05201101	12/2012		<b>)</b>		-	
pH 4 Buffer		05201102	9/30/12	] ] /	a ciD	-	R	un#
pH 7 Buffer	524.	04271102A	3/2013		-96.9%		· Marghad Afferna.	**************************************
pH 10 Buffer	SZ41	04261102	9/30/12					Translate C
pH in liquid: (1) 90	40B, (2	) 9040C <b>pH in s</b>	solid: (3) 90450	C, (4)	9045D (Note m	ethod num	ber in column labe	led # below )
pH adjustment:(5)	7196A,	(6) 7199 (Note :	method # In coli	imn l	abeled#)			
Sample	#	рН	Temp. <sup>0</sup> C		Sample	#	рΗ	Temp. °C
pH 2.000	5	2.002	22,10					the national control of the control
pH 4.000		3.987	22.40					
pH 7.000		6.983	225			-		outer en march
pH 10.000		9.997	22.70			·		and the state of t
Ref#: 524-0520110-	3	7.392	22.80					-
DI		1.869	21.50					
PH 2.000	1	1.982	2210					
TIME: 143	30	Som					-11	Mu
pH 2.000	5	2.024	23.4°				all IV	<b>V</b>
P1103380-10	/	1.802	19.20				JW 101	
===2.0	/	1.890	18.60			Z	\ VI	A Difference
-3.0	<u>/</u>	1.817	18. T			7		A damento o
-4.01	1	2.177	19.40			1		A. P. D. D. B. D.
5.01	3	1.773	19.70					COMMENTAL
-6.0		1,907	19.60					eso a anima
V -7.01	/	1.912	20,10			\		call and a second
DH 2.100		2.022	23,20					
pH Adjustments:	\$719	<b>6A</b> : Diluted/0	Conc H <sub>2</sub> S0 <sub>4</sub> <u>&amp;</u>	MD	49284EXP	/	1/20/14	
		9A: Diluted N					, ,	
Comments:				-	·			
* Soil or Solid pre	ep: 1:1	(wt:vol) with	DI water: ** S	Sam	oles received	past re	ecommended	d hold time.
Date buff	ers an	d filling soluti	on changed:		8/29/4			
Note: ATC probe	used:	therefore, te	mperature co	orrec	tion calculati	on is n	ot necessary	•
Λ 1		A-				91	2/	
Analyst:		Vo			Date:			<b>-</b>
Reviewer:		- FR	······································	•	Date:	7/1	0/1/	pH.XLS

T	Columbia	
	Columbia Analytical	Services**

Analyzed By:

Reviewed By:

Method EPA 7196A

01 6 12 1
Run#:
Prep Run#:
Conc. H <sub>2</sub> SO <sub>4</sub> Lot#: PMD 44984 EXP. 3/2012
Coloring Reagent Ref#: 534-08021104 EXP. 9/00/11

						, - , , ·
Working Curve:	Prep Dilution	N.A	0.05/50	0.25/50	0.5/50	Corr. Coeff.
	Concentration mg/L	0.00	0.01	0.05	0.1	- 200200134
	Absorbance @ 540 nm	0,000	0.011	0.058	0.117	0.994184134

	Sample #	Sample Vol.(mL)	Dilution		Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1 ICB		10ml	**manarar**	V	0.000	0.000	0.000	0.006344	40.003
2 ICV	0.05Pfm	(		1	0.000	0.059	0.059	0.0507	101%
NB			**************************************	1	0,000	0.001	0,001	0.00120	10.003
115	0.048Pm				0.000	0.046	0.046	0.0396	99/2
11103	380-1.01				0.000	0.001	0.001	0.00120	10,003
	[-1-01 MS0.0	SIMM	Samuel Marie	1/	0,000	0.044	0.044	0.0379	76%2
	-1.01 MSD			6	0,000	0.045	Q 045	0,0387	7705
-	-2.01		Mary Control of State		0.000	0.000	0.000	0.000344	10.003
	-2.01 KS 0.0	3PPM	<b></b>		0.000	0.030	0.030	0.0259	86%
The state of the s	-3.0/		**************************************		0.002	0.003	0.001	0.00120	20,003
	-4.01		Carried States	مرن	0.000	0.000	0.000	0.0003/4	
7	-5.0/m.		Superculation of the con-		0.000	0.000	0.000	0.000344	
ZOVI	<u> </u>		And the state of t		0.000	0.057	0.057	0.0507	10/10
PIIC	3380-6.01		pposint della Strict.		aavo	0.000	0,000		
	V -7.01			ارا	0.000		0.000		
100	2 0.05 PPm		and the second second	اس ا	0.000	0.059	0.059	0.0507	101%
601	- 2	7		6	D-000	0.000	0.000	0.00344	10.003

pH Requirement: Method 7196A (2 ± 0.5) *Samples filtered prior to pH adjustment
pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment ICV/CCV spiked with 225 ml of 524-1015/001 \$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 $f = \frac{1}{100} \uparrow 50$ 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: Date/Time: 9/2/1/ (W /500)

Date/Time: G/P/// W
Date: 9/1///

<u> </u>	40			
	10/6/10	524-1006/001 25/3	3pb Stock	for 03
₹,		<b>₽</b> .05 ml Pyridine-4-carboxaldehyd	de Alfa Aesar	The second secon
			(11/12) up to 500 ml w	1)1
		EXP: 10/20/10		
	Malaka	524-1006/002	25/33pMs	Tolan 6 0:
	- Wello		• -	Julico for
	DV -	0.05 ml Pyridine-4-carboxaldenyde ( <u>IC; IWC</u> ;Exp: \$//0// Water.	2 ) up to 500 ml w/13	]
1	:	EXP: 10/20/10		
	; 	524-1006/003	MBTH S	9/17
	10/0/10	0.5000 g MBTH (Aldrich <b>54</b> )	696EK :Exp: 8/7/1	Ψ ) up
		to 100 ml w/ DI Water. Plus 0	.5 ml Conc. H <sub>2</sub> SO <sub>4</sub>	MO 49784; EXP 11/2
	:	EXP: 10/7/10		
	TolKlin	524-10151001	GGT TOVI	CON Stack
	10/0	Purchased	100 PPM (	Cr6+
	<i>J</i> 00	RICCA Chemical Co	Cut No	2095-16
		500ml Plastic		
	!	LOT# 10/0177 EXP: 3/20/2		
		EXP: 3/20/2		
	Interto	COIL INIMAN	ZMM OOM	NOZ Stock
	10/15/10	524-10/5/002	201111	NUL SICK
		RUCHUS COL	Cut No: c	51144 5-4
	,	LOT# 1010271	120 m / alm	Jer 9/45
	A CONTRACTOR OF THE PROPERTY O		100 MIL CON	July July

524-0221101 1:142804 OMPLETERY 524-022/1102 Orbot Colorina Kinglin 0.2500g 1,5-0ipheny/curbuhydradide (EMD 107 47/03; QP: 1/30/13) 1 50 ml W/Alltone (eMD) LOT # 47154D; EXP: 9/34/12). EXP: 3/91/11 534-0228/101 0.1NH2SOY 5.6 ml and 11284 (como 49284 exp 11/20/14/1. W/DI HZO al: 3/28/12 0228/102 1001 mg/2 Cubt Inorganic Ventures CGCR (6)1-1 125 mL Clear Glass D2-CR03040 AP: 3/1/2012

9/30/12 NH3 FILLING EXP: 436/12 1:1 42504 142 SUY (DMD 49284; EXP: 11/20) ADDED SLOWLY TO 250MI DIHZO LET COL 1 12/1: 4/26/12 624-04271101 Amino 6.25m (conc H2SOY (and 49284; Oxf: 11/26/14) 2,5 M DI HZC. DISSOUT 1.68757 NN DIMETLY P- Phenylevediamin oxulut (Fluka 1363386 13408 Zed) ( OXP: 8/7/14
in will suituric Soin and dilute to 25ml W 1:1 H2504 (524-0436/1 64; OXF: 4/20/12) 1XP: 5/25/11

BDH9646- 500 M. 524-04281101 U/N HZSUY 5.6 ml Cone 42804 (enio 49284; EXP:11/20/14, 524-05041101 A/Ka/ing Digistion So/4 2009 NAOH (EMO 47022713; EXO: 10/11/12) + 30.09 9 NAZLOZ (EMO 46321715B) exp. 10/11/12 12 W/ DI HZO 524-05051101 Cret Coloring reasont 0.2500g 1,5-Diphenylcarbohydrazide (GTBACY JOSE41) EXP. 06/15/15 J. SOML W/Alexand (EMD 47154 D) 100 m | 524-04191101 (10x une grant: en: 9/22/11) 11 11 NIDIH20- Deega SSCel

8/02/11	524-08221104 CV 6+ Colorine Reagly
	524-0822/104 CV 6+ Coloring Feagle 0.25g 1,5-0ipneny/Carbohydrazide (Ji Byker; Jos 64 EXP. 6/15/15) I GIN W/ Acetore (EMD)
	6/15/15) 9 G/W W/ Acetone (EMD)
	0747159DEXT 1109(12)
8/22/11	524-08221105 1000PM Soz stock
	### D1 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to ##### 100 ml w/ D1 Water.
	EXP: 9/5/11
8/2/11	524-0822/106 /000 Am So3 Ia/ca
	0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water. EXP: 9/5/4
8/23/11	524-08231101 1000ppb (r 6+ Stock 0.1 ml 524-02281102 (1001ppm (r 6+; Exp: 3/1/12)
	0./ml 524-02281102 (1001 ppm (1°07) Exp: 3/1/12 1 100ml w/ flf ADJUSTED DE (PH=9.426) Oxf: 3/1/12
8/23/11	594-0873/102 250pp Of Ia/Ca
	mL with pH adjusted (pH= $\frac{7.426}{10}$ ), degassed DI Water.
	EXP: 9/6/11

524-0824/191, Sulfanilamide Solu 5.00G Suffanilamide (57 baker; LoT+ J32618) EXP: 1/6/16 DISSOVEDIN SOME CONCHC/ (EMD 49260; EXP. 2/7/16) 1 500ml W/DTHE PXP 8/24/12 S24-08241102 NODA WIN 0.2500g N-1-Naphthylethylenediamine olihydruhlorid (JT BAKER H22587, EXP: 10/19/14) 1 25 MW DT EXP: 2/24/12 0-1N HZ SOY 5:6ml Conc 147504 (M) 49984; EXF: 11/20/14 1 21 N/DI H20 CXP. 8/29/12 10PM Prot Sta (1000 ppm Cr lot; EX1: 3/1/12) 1 100 ml 2/DIH20 EXP: 3/28/12



# 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103410

JPL GW Mon 3Q11 / 100006114 Project:

# **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.

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.



Client: Battelle

JPL GW Mon 3Q11 / 100006114

Date Received: Time Received:

Project ID:

9/6/2011 14:22

DETAIL SUMMARY REPORT

Service Request: P1103410

Client Comple ID	Lab Cada	Matrix	Date	Time	196A
Client Sample ID	Lab Code	Matrix	Collected	Collected	<u></u>
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert -Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

## Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# Employee - Owned Company Analytical Services NC.

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

Page \_

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

Company Name & Address (Reporting Information) Email Address for Result Reporting Project Manager 619726-7311 3990 BATTELLE DAND とする D.C.60, OLD town AVE CONNER なり Fax 114) 458-6614 Fax (805) 526-7270 Phone (805) 526-7161 92110 - C - 205 Sampler (Print & Sign) MFTN: GERBID TOMPKINS Project Numbers 285651 P.O. # / Billing Information Project Name JCL. 6W. MON COLUMBUS OH 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard Requested Turnaround Time in Business Days (Surcharges) please circle 1BATTELLE 4320 organics GC/MS 260B □ Oxygenates □ TPH Gas □ : 8015B □ 21B □ MTBE 8021B □ el 8015B 
(Subcontracted) sel Low Level 8015B 

(Subcontracted) □ 8015M (Subcontracted) Analysis Method and/or Analytes atile Organics GC/MS 270C 🗆 (Subcontracted (7196 工 Preservative Code CAS Contact: CAS Project No Preservative Key NaOH H2S04 HNO3 HCL Other Asc Acid None Zn Acetate

Tier I - (Results/Default if not specified) Tier II - (Results + QC) Relinquished by: (Signature) Relinquished by: (Signature)	Report Tier I evels - please splect	E8-10-09/06/11	Dupe-05-3011	mw-25-1	mw-25-2	MW-25-3	MW-25-Y	MW-25-5		mw - 26 - 1	mw-26-2	Client Sample ID
Jana		(3) %/11 0	- 1/9/1 (%)	CD 9/6/11 1	8	3	(E)	(3) 9/6/, 1		(2) 9/6/h 0	(1) 9/6/11 0	Laboratory Date ID Number Collected C
Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)		A45 W	1	1231 W	1210 4	1142	7-	W 050		0936 ±	09/7 w	Time Matrix
by: (Signature) by: (Signature) by: (Signature)			_			`						Containers  Volatile Or 624   TPH Gas 8 BTEX 802
MRL required Yes / No MDL / PQL / J required Yes / No Vacable Williams (No Vacable Williams)		X	X	×	X	×	X	×	-	X	X	TPH Dieses TPH FC T Semi-Volat 625   82
No Type:												
Time: 1345 Time: 77	Dr.											
Cooler Blank) Ice / No Ice	Project Requirements (MRI s OAPP)	Can pront Bla	Dupliem 75									Remarks

# Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Service Request: P1103410

JPL GW Mon 3Q11/100006114 Project:

Client: Battelle

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103410-001.01					
	7196A	0/6/11	1.420	CMO /MZAMODA	
		9/6/11 9/6/11	1429	SMO / MZAMORA	
			1430	P-37 / MZAMORA	
		9/6/11 9/6/11	1447 1610	In Lab / SANDERSON P-37 / SANDERSON	
		2/0/11	1010	1-3// SANDERSON	
21103410-002.01	<b>-</b> 1061				
	7196A	9/6/11	1.420	SMO / MZAMORA	
		9/6/11	1429 1430	P-37 / MZAMORA	
		9/6/11	1430 1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
		<i>)</i> // 0// 11	1010	1 377 SINVERSON	
21103410-003.01	71064				
	7196A	9/6/11	1429	SMO / MZAMORA	
		9/6/11	1429	P-37 / MZAMORA	
		9/6/11	1430	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
		9/0/11	1010	1-37 / SANDERSON	
21103410-004.01					
	7196A	0/6/11	1.420	CMO / MZ AMOD A	
		9/6/11	1429	SMO / MZAMORA P-37 / MZAMORA	
		9/6/11 9/6/11	1430 1447	In Lab / SANDERSON	
		9/6/11	1610	P-37 / SANDERSON	
		9/0/11	1010	1-5// SIMDLEGON	
P1103410-005.01					
	7196A	0/6/11	1.420	CNO /NG ANODA	
		9/6/11	1429	SMO / MZAMORA	
		9/6/11	1430	P-37 / MZAMORA	
		9/6/11 9/6/11	1446 1610	In Lab / SANDERSON P-37 / SANDERSON	
		9/0/11	1010	1-5// SMINDERSOIN	
21103410-006.01					
	7196A	01/2/14	1.400	0.10 / 1.17 / 1.16 2 :	
		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	

# Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103410

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	

# 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

# **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103410			
Project:	JPL GW Mor	n 3Q11 / 100006114								
Sample(s	s) received on:	: 9/6/11			Date opened:	9/6/11	by:	MZAN	1ORA	
Tote: This f	orm is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody sea	ls is strictly mea	nt to indicate presence	absence and not a	s an indic	cation of	
ompliance of	or nonconformity.	Thermal preservation and p	oH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S		Nia	NI/A
								Yes	No	<u>N/A</u>
1	_	containers properly n	narked with cl	ient sample IL	<b>)</b> ?			$\boxtimes$		
2	Container(s)	supplied by CAS?						X		
3	Did <b>sample c</b>	ontainers arrive in go	od condition?					X		
4	Were chain-o	of-custody papers used	and filled out	?				X		
5 Did <b>sample container labels</b> and/or tags agree with custody papers?										
6	Was sample	<b>volume</b> received adequ	ate for analys	is?				X		
7	Are samples v	within specified holding	g times?					X		
8	Was proper to	e <b>mperature</b> (thermal p	preservation) o	of cooler at rec	eipt adhered	to?		X		
	Cooler Ten	nperature: 2° C Bla	nk Temperatu	re: ° C						
9	Was a <b>trip bl</b>	ank received?								X
10	Were custody	y seals on outside of co	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	re and date included?								X
	Were seals in	tact?								X
	Were custody	seals on outside of sa	mple containe	r?					X	
	•	Location of seal(s)?	_				Sealing Lid?			X
	Were signatur	re and date included?								X
	Were seals in									X
11		rs have appropriate <b>pr</b>	eservation, ac	ecording to me	ethod/SOP or	Client specified i	nformation?	X		
		ent indication that the s		•						X
		vials checked for prese								×
		nt/method/SOP require			amnle nH and	d if nacessary alte	r it?			×
	Tubes:	Are the tubes cap	-		ampic pri and	i <u>ii necessary</u> and	1 11:			$\boxtimes$
12	Tubes.	•	•	•						
10	D 1	Do they contain n		1 1: 4 40						X
13	Badges:	Are the badges p				11.				X
		Are dual bed badg	ges separated a	and individual	ly capped and	l intact?			<u> </u>	X
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Preso	ervation	1
		Description	pH *	pН	pН	(Presence/Absence)	(	Comme	nts	
1103410	-001.01	125mL Plastic NP								
1103410		125mL Plastic NP								
1103410		125mL Plastic NP								
1103410		125mL Plastic NP								
1103410	103410-005.01 125mL Plastic NP									
1103410	-006.01	125mL Plastic NP								
1103410		125mL Plastic NP								
1103410	-008.01	125mL Plastic NP								
Explain	any discrepanc	ries: (include lab sample	ID numbers):							

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

# Sample Acceptance Check Form

Client:	Battelle	Work order: P1103410	
D	IDI CWM 2011 / 10000C114		

Project: JPL GW Mon 3Q11 / 100006114

Sample(s) received on	: <u>9/6/11</u>		]	Date opened:	9/6/11	by: MZAMORA
Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	
P1103410-009.01	125mL Plastic NP					
1						

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

# 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

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	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	

Report By:SAnderson

Approved By Kau Rya

QA/QC Report

Client: Project:

Battelle

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 CCB1	0.010 0.010	0.003 0.003	ND ND
CCB2	0.010	0.003	ND

Approved By:

ICCBMDL/120594

Date:

Kam Rya

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: \_

CCV1A/120594

Date:

Karer Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q11

**Project Number:** Sample Matrix:

100006114 WATER

Service Request: P1103410

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

09/06/11 Date Analyzed:

Laboratory Control Sample Summary **Inorganic Parameters** 

Sample Name:

Laboratory Control Sample

Lab Code:

P1103410-LCS

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS Percent	
Analyte	Prep Method	Analysis Method	True Value	Result		Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0382	96	90-110	

Kam Rya

Report By:SAnderson

13 of 23

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

Lab Code:

P1103410-001MS

P1103410-001DMS

Units: mg/L (ppm)

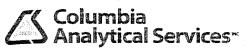
Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike .	Result		oike overy	CAS Acceptance	Relative Percent	Result
Analyte	Method		PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0426	0.0426	85	85	73-119	<1	

Kau Rya

Date:



	pH Run Log										
Service Reques	t #(s):	<b>:</b>	7	P1103410							
Time: 0953											
Sample		WR lot#	Exp.	Slope		Prep	.Run #				
pH 2 Buffer	524-0	15201101	12/2012			-					
pH 4 Buffer	524-6	9201102	9/30/12	€ 98.7	V) -	Rı	un#				
pH 7 Buffer		04271102B	3/2013	70.7	10						
pH 10 Buffer	5247	04261102	9,80/15	(,)							
pH in liquid: (1) 904		· ·			method nun	nber in column label	ed#below)				
pH adjustment:(5)	7196A,	(6) 7199 (Note i		ımn labeled # )							
Sample	#	рН	Temp. ⁰C	Sample	# .	рН	Temp. <sup>0</sup> C				
pH 2.000	5	2.011	21.40	P1103410-9.0	15	2.084	15,60				
pH 4.000		4,008	21.50	DH2.NO	5	2.018	20.6				
pH 7.000		7.003	21.50								
pH 10.000		9.690	21.60								
Ref#: 524-05201109	15	7.38/	21,70								
DT		2.072	21.50				(				
PH 2.000	V	2.000	21.60			SIM	not Uslex				
TIME: 150	5	8				June 1					
DH 2.000	5	2.006	10.80								
P1103410-1.01	T	1.774	14.10								
1-2.01		1.962	14.80		1						
-3.01	100	1.954	14.00								
-4.01		1.889	14.70								
-5.01		2618	14.80								
-6.01		1.842	1470				L.				
-7.01		1723	1520		<del>- </del>						
-8.01		1.910	15,20								
pH Adjustments:	₹719	<b>96A</b> : Diluted/0	Conc H <sub>2</sub> SO <sub>4</sub> &	UD 49284 EXP	: n/:	Lolly					
,			VaOH								
Comments:											
			Western Control								
* Soil or Solid pre	эр: 1:1	l(wt:vol) with	DI water: ** S	Samples receive	d past r	ecommended	d hold time.				
			ion changed:	-1.1			_				
Note: ATC probe			•		tion is r	ot necessary					
					al.	1.1					
Analyst:		186/10		Date	- 7/6	W,	-				
Reviewer:	`	- KL		Date	: " "	1/10/11	pH.XLS				

f pH adjusted DI Water (T.V.= 0.04 ppm)

10 ml of sample (T.V.= 0.04 ppm)

Date/Time: 9/6/1/ @/534

Date/Time: 9/6/1/ (W/54/)

Date: Great to who

Prepared By: \_

Analyzed By: \_\_\_ Reviewed By:

7 Columbia		Hexava	lent	Chromiu	m (Liquids)	P.	age 2 de	<del>)</del> 100
S Columbia  Analytical Service	s <sup>wc</sup> M	lethod E	PA	7196A	4	_		100
vice Request#(s): P1/030 ck#: 504-08291103 1/CCV#: 504-10/5100/7/	40		- /	Run#:	2604	25		
:k#: <u>524-08291102</u>	T.V=1000	M EXP: 27	1291	Prep Run#			acil me	ulador
1/CCV#: <u>\$24-10/5700/ 7.v</u>	-100PPM	EX1:3/	70/)	Conc. H <sub>2</sub> SO	D4 Lot#:	EMD 493 SZ4-0906	284 EXP. 1101 EXP.	4/30/14
		, , , , , , , , , , , , , , , , , , ,	,	Coloring R	eagent Ref#:			
Working Curve:	<del> </del>	rep Dilution ration mg/L		<i>NA</i> 0.00	0.05/50 0.01	0.25/50	0.5/50	Corr. Coeff.
		e (a), 540 nm		0,000	0.010	0.057	0113	0. 999908467
		1 7 7						
		PE				Corrected		
0 1 "	Sample		~/	<b>10</b> i	Absorbance	Abs. (minus bkg.)	Results -	QA/QC - %R
Sample #	Vol.(mL)	Dilution		Bkg.	@: 540nm		mg/L	/ RPD
P1103410-9.01	10M/	•	<u> </u>	0.000	0.000	0.000	0.000426	10,003
COVZ			2/	0.000	0.058	0.058	0,6514	1030/0
Ch2		_	1/	0.000	0.000		0,000426	20,003
						0.00		
_	-		<u> </u>					
		-						
						······································		
`								
		-		-		1/ 1/2+	1100	
		<u> </u>			July	X 1101	434	
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			1					
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pH Requirement: 1 ICV/CCV spiked with 0	Method 71	96A (2 ± 6	9.5) W	Samples	filtered prior	to pH adjustn	ent	
								)
MS/MSD spiked with LCS spiked wit								
erification Standard Spiked	n v.2 mi oi	ml of	<u>t                                    </u>	[ 50 mi or ]	pH adjusted D ↑10 ml of sai	I Water (T.V.= mple (T.V.= $ ilde{ heta}$	0.04 ppm)	
Comments:	Walblu	,	<u>V</u>		, 10 1111 01 041	p. (2.,, _ <u>o</u> _	in the second	
	11 - 1 - 1					1,1	1	American (1997)
Prepared By:	A CONTRACTOR OF THE PARTY OF TH				Date/Time:	9/6/11	(W/525	>
Analyzed By:	<del></del> -				Date/Time:	9/6/16	(a) 1540	)
Reviewed By:					Date:	1/10/11	/	
						F 3		

40	
10/6/10	524-10061001 25133ppl Stock for 03
	Q.05 ml Pyridine-4-carboxaldehyde Alfa Aesaw
JW	10/46598 ;Exp: 8/11/p) up to 500 ml w/DI Water.
	•
	EXP: 10/20/10
- //	2011 2012 2022 2020 Today 1 1-
10/6/10	524-10061002 25/33pp Jay/CU for 0=
- SV	0.05 ml Pyridine-4-carboxaldehyde TCI
	( <u>IGIINC</u> ;Exp: <u>9/10/12</u> ) up to 500 ml w/Dl ——Water.
į	EXP: 10/20/10
	201 · 10/= - 10
	524-1006/003 MBTH SO/17
intalia	
1000	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> emo 44J84; CN 11/2,
	EXP: 10/7/10
:	
10115110	524-10151001 Crot ICV Strepe
	Parchased 100PPM Cr6+
D	FICA (benzical Ch Cut No 295-16
	EDD and Plactic
,	10-16
	LOT# 10/0177
	EXP: 3/20/2
10/15/10	524-10151002 500PM NOZ Stock
	Purchased
:- JOV	RCA Chemical Co Cut No: 5444.5-4
×	105t 1010 7-1 120 01 01 10 01 10 00

1:1H250 LOT#47154D; EXP: 9/24/12 EXP: 3/21/11 534-0228/10/ 0.1NH2SOY 56ml and 1128y (omo 49284 exp.11/20/14) W/DI 470 EXP: 3/28/12 228/102 1001 19/4 ON6+ Inorganic Ventures CGCR (6)1-L Clear Glass D2-CR03040 3/1/2012

NH3 FILLING 94/26/11 6.25m (come H2SOY (OND 49 284; Oxf: 11/20/14 N. N-Dimethy 1:1 H2504 (524-042611 by; 0x1: 4/20/12

BD1-19646-500M 5.6 ml Cone AZSOY (END 49284; EXP: 06/04/ 524-05051101 What Coloring reasons
0.2500g 1,5-Diphenylcarbohydrazide (Granter Jose41;
exp: 06/15/15 1. 50 ml w/Acetons (END 47154 D; 14 - ws Elucat MI 524-04191101 (10x ums great: EN: 9/2 LWIDIH20- DEGGSSCE)



# 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-ELAPaccredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-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.

Sue Anderson

Project Manager



Client: Battelle CAS Project No: P1103428

JPL GW Mon 3Q11 / 100006114 Project:

# **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.

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

JPL GW Mon 3Q11 / 100006114

Date Received: Time Received:

Project ID:

9/7/2011 15:17

Service Request: P1103428

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A
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

MModified MethodMDLMethod Detection LimitMRLMethod Reporting Limit

MS Matrix Spike

MTBE Methyl tert - Butyl Ether

NA Not Applicable
NC Not Calculated

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

NTU Nephelometric Turbidity Units

ppbParts Per BillionppmParts Per Million

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

RPD Relative Percent Difference SIM Selected Ion Monitoring

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

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

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

TTLC Total Threshold Limit Concentration

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

### Qualifiers

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

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

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

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

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

D The reported result is from a dilution.

X See case narrative.

# Columbia Analytical Services NC

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

Page \_\_\_\_ 으

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

An Employee - Owned Company Ph	Phone (805) 526-7161	geedis	Requested T 1 Day (100%	urnaround T ) 2 Day (75%	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	s Days ( 4 Day (	Surcharge 35%) 5 Da	<b>)s) pleas</b> ly (25%)	e circle 10 Day	- Standard		CAS Project No.	シャン はNo.
Company Name & Address (Reporting Information)	porting Information)	Project Name	ame			An	Analysis Met	Method and/or Analytes	or Anal	ytes		CAS Contact:	ct:
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Project Manager		P.O. # / Bi	/ Billing Information ~	on .	ed)	i)	)						
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Email Address for Result Reporting		Sampler (Print & Sign			□ 0: 5B □ □ M <sup>-</sup> 015B (	Orgar							
	Sno Sno	Brobson X		*	260B s 8018 21B ( sel 80	latile	3270C						
Client Sample ID	Laboratory Date ID Number Collected	Time Collected	Matrix	Number of Containers	Volatile ( 624 □ - 8 TPH Ga BTEX 80 TPH Die TPH Die	TPH FO	625 🗆 :						Remarks
MW-12-3	(4/8 (A)	11 0951	W	/			×						
MW-12-2		1011	W	_			X						
MW-12-1	(3)	1042	N	2			×						MS/MSD
EB-11-09/07/11	(A)	1029	7	1			Х					6	EQUIPMENT BLANDE
	)												
MW-11-3		1216	K	\			X						
Nw-11-2	6	1238	K	/			Χ						
Mw-11-1	(E)	1316	ξ	/			X						
	8												
Inpi-01-7011	14/0 (38)	+	S	1			×						DAPHEATE
						_		-	_	-	-	_	
Report Tier Levels - please select Tier 1 - (Results/Default if not specified)		. (Data Validation	Tier III - (Data Validation Package) 10% Surcharge	Surcharne	MBI_required Yes / No	red Yes /	20		EDD regi	EDD required Yes / No		Project Rec	Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)

Date:

Time

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

MDL / PQL / J required Yes / No

Type:

000

Temperature 202 Cooler //Blank / Ice / No Ice

Relinquished by: (Signature) Relinquished by: (Signat Tier II - (Results + QC)

Tier V - (client specified)

# Columbia Analytical Services, Inc.

Columbia Analytical Services, Inc.

Analytical Services

265Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103428

JPL GW Mon 3Q11/100006114 Project:

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1103428-001.01					
	7196A	0/7/11	1505	CMO /MZAMORA	
		9/7/11	1537	SMO / MZAMORA	
		9/7/11 9/7/11	1537 1559	P-37 / MZAMORA In Lab / SANDERSON	
		9/7/11	1653	P-37 / SANDERSON	
P1103428-002.01					
1103 120 002.01	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					
1103 .20 003.02		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	
21103428-005.01	7106				
	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	
21103428-006.01					
	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				

Printed 9/8/11 16:28 Intenal Chain of Guztody Summary Page 1 of 2

## Columbia Analytical Services, Inc. Columbia Analytical Services, Inc. Analytical Services 265 Chain of Custody Report 3065 | 805.526.7161 | www.caslab.com

Client: Battelle Service Request: P1103428

JPL GW Mon 3Q11/100006114 Project:

<b>Bottle ID</b>	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	
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	

### 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

### **Sample Acceptance Check Form**

Client:	Battelle					Work order:	P1103428			
Project:	JPL GW Mor	n 3Q11 / 100006114								
Sample(s	s) received on	: <u>9/7/11</u>		<u>.</u>	Date opened:	9/7/11	by:	MZAN	1ORA	
Tote: This f	form is used for <u>all</u>	samples received by CAS.	The use of this for	rm for custody sea	als is strictly mea	nt to indicate presence	absence and not a	s an indic	cation of	
ompliance of	or nonconformity.	. Thermal preservation and	pH will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/S		<b>N</b> I -	NI/A
								Yes	No	<u>N/A</u>
1	_	containers properly i	narked with cl	ient sample IL	<b>)</b> ?			$\boxtimes$		
2	Container(s)	supplied by CAS?						X		
3	Did sample o	<b>containers</b> arrive in go	od condition?					X		
4	Were chain-o	of-custody papers used	l and filled out	?				X		
5	Did sample o	container labels and/o	r tags agree w	ith custody pap	pers?			X		
6	Was sample	volume received adequ	uate for analys	sis?				X		
7	Are samples	within specified holding	ng times?					X		
8	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		X		
		nperature: 2° C Bla			-	Wet 1	Ice			
9		ank received?	1							X
10	-	y seals on outside of co	ooler/Box?						X	
10	.,	Location of seal(s)?					Sealing Lid?			×
	Were signatu	re and date included?					Bearing Ela.			×
	Were seals in									X
		v seals on outside of sa	mnla containa	<b></b> ?					×	
	were custous		_				C1: I : 40			$\boxtimes$
	<b>X</b>	Location of seal(s)?					Sealing Lid?			
	_	re and date included?								X
	Were seals in					~·· · · · · · · · · · · · · · · · · · ·				$\boxtimes$
11		ers have appropriate <b>p</b> r		_		Client specified i	nformation?	$\boxtimes$		
		ent indication that the								X
	Were <b>VOA</b>	vials checked for prese	ence/absence o	of air bubbles?						X
	Does the clie	nt/method/SOP require	e that the analy	st check the sa	ample pH and	d if necessary alte	r it?			X
12	<b>Tubes:</b>	Are the tubes cap	ped and intact	?						X
		Do they contain r	noisture?							X
13	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bad	ges separated a	and individual	ly capped and	d intact?				X
T -1- (	Completion	Compto in our	Did	D	A 3543	VOA Haadaaaa	D	4 / D	4 •	
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	_	t / Preso Commei		
1103428	3-001.01	125mL Plastic NP								
1103428	3-002.01	125mL Plastic NP								
1103428	3-003.01	125mL Plastic NP								
1103428		125mL Plastic NP								
1103428		125mL Plastic NP								
1103428		125mL Plastic NP								
1103428 1103428		125mL Plastic NP								
1103428	-007.01	125mL Plastic NP				<u> </u>				
Explain	any discrepand	cies: (include lab sample	ID numbers):							

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

### Sample Acceptance Check Form

		Sumple Receptance Check I of m	
Client:	Battelle	Work order: P1103428	
Project:	JPL GW Mon 3Q11 / 100006114		

Sample(s) received or	n: <u>9/7/11</u>		_	Date opened:	9/7/11	by: MZAMORA
Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1103428-008.01	125mL Plastic NP					
		<u> </u>				
	+					
		I		ı	1	

Explain any discrepancies: (include lab sample I	D numbers):		

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

### Analytical Report

Client:

Battelle

**Project Name:** 

JPL GW Mon 3Q11

Sample Matrix: WATER

Project Number: 100006114

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

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	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	

Kam Rya

QA/QC Report

Client: Project: Battelle

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:

Units:

7196A 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

ICCBMDL/120594

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: Units: 7196A 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

CCV1A/120594

Datas

Kaur Rya

QA/QC Report

Client:

Battelle

Project Name:

JPL GW Mon 3Q11

Project Number : Sample Matrix : 100006114

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

Units: mg/L (ppm)

Basis: NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result			Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0407	102	90-110	

pproved By Kall Pya Date : 9/8/11

Report By:SAnderson

13 of 22

QA/QC Report

Client: Battelle

JPL GW Mon 3Q11 Project Name:

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

Lab Code:

P1103428-003MS

P1103428-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS		Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0415	0.0415	83	83	73-119	<1	



# pH Run Log

Service Reques	t #(s)	<b>::</b>	PII	l b	3428			
service	<u> </u>							
ime: 0 1 1 2	\ \	/WR iot #	Exp.		Slope	<u> </u>	Prep	.Run#
	42	4-09201111	12/2012					-
- 0 HIII''	524	-06701102	9/30/12		1 20	26/	Ri	un#
H 4 Duitfor	524	-042711026	3/2013		E 4X.	$U_{\lambda}$	- Lynnya.	, , , , , , , , , , , , , , , , , , ,
H / Day	524	0476102	9/30/12		.) (		14 february	
H 10 5 (1) 90	40B, (2	2) 9040C <b>pH</b> in s	solid: (3) 9045	- С, (	(4) 9045D (Note m	nethod nun	nber in column labei	led # below )
oH in liquid: (1) 900 oH adjustment:(5)	7196A	(6) 7199 (Note i	method # In col	um	n labeled#)			,
oH adjustmente	#	рН	Temp. <sup>0</sup> C		Sample	#	pН	Temp. °C
Sample	5	2.006	20.50		PH 2.600	5	2.019	20.40
pH 2.000		4.0.74	21.40		177 2000		21011	70.7
pH 4.000		1 '	101 to	H	`			
pH 7.000	-	7.6/6	71.60					
pH 10.000	2	10.016	21.5			<del> </del>		
Ref#: 541-67701102	2	7,407	21.80					Company of the Compan
Mi-		1.994	216	12.0				
0H Z.000	1	12.00	20.40				. 1	
TIME: 16	000	Sa	9,000			^	1 : 1 K	
2020	5	2.012	2080			1	IX VIN	
111 2000		2089	T1.40				171	
P1103428-1.01		12 621	1/130			1	The state of the s	
1-2.01		2.01	13,20			7 \	l V	
-3.01		11900	1215					
-4.01		1.806	12,1					
-5.01		1.833	12.60					
-601		1.876	13,20		į			
1-7.01		1.944	13.4	11				
1 X01	1	1,831	13.60			1	,	
pH Adjustments:	1 71	964: Diluted/0	Conc H <sub>2</sub> SQ J	M	n uanivexp.	11/20	114	!
pH Adjustine its.		99A: Diluted I	Ja0H Ja0H	ZF 1	EXP.	- 111.00	<del></del>	
Comments:		Dia Diacou			—/ \( \ \			
Commission								· · · · · · · · · · · · · · · · · · ·
°	nn: 4:	1/4/4/2011 : : : : : : : : : : : : : : : : :	D1 1410+0= ** (	2 ~ .	malas rassius	1 nast	000000000000000000000000000000000000000	thoid times
* Soil or Solid pre							econimenaea	i noid time.
		nd filling solut			7			
Note: ATC probe	usec	a; therefore, te	emperature co	orr	ection calculat	ion is n	ot necessary	
Analyst:		$\mathcal{A}$			Date:	91	7/11	
		<u> </u>	\$	-		0.7	6 /.	
Reviewer:		11		-	Date:	7/.	X 4//	pH.XL

Se Sto IC	Hexavalent Chromium (Liquids)   1   Columbia   Analytical Services   Method EPA 7196A										
		Working Curve:	Prep Dilution				NA 0.00	0.05/50	0.25/50 0.05	0.5/50	Corr. Coeff.
			Concentration mg/L Absorbance @ 540 nm				0.000	0.011	0.057	0.113	0.999986
		Sample #	Vol.	nple (m <b>]</b> )	Dilution		Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %I / RPD
1	ICV	0.05PPM		MU_		1	0,000	0.000	0.000	0.0006356	1019
2					-	1	0.000	0,000	0,000	0.0000352	40,003
3	300	0.04 PPM			_	1	0.000	0.046	0.046	0.0407	102%
4	ļ	3428-1,01			managadish	V	0.000	0.000	0.000	0.0000356	10,003
5		-1.0/VS 0.03PP	n.a		<b></b>	1	0.000	0.030	0.030	0.6265	88%
6		-2.01	,		<u></u>		0,000		0.001	0.000919	20.003
7		-3.01				/	0.000	0.000	0.000	0.000356	
8		-3.01 MS0.05A	m		Name of the last o	1	0,000		0.047	0.0415	837
9	1	-3.0/NSO I			**************************************	7	0.000		0.047	0.0415	854
10		-4.01				/	0,000	0.001	0.001	0.000919	10.00 =
11		-5.01			-	1	0,00		0.001	1	J
	GNI	6.05PPM				Z	0,000	0,05%	0.058	0.0513	7057
	12 ab 1 13 f1103428-6.01						0.000	0.000	0.000		
13		1 -7.01				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0.000			0.000919	
14		-8.01				1	<u> </u>		0.000	0.0000356	
15	<del></del>	4				d	0.00		0.000		V
16	CON	2 0.05PM			_	1	0,000	0.058	0.058	0.0513	/03%

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

ICV/CCV spiked with 1.75 ml of 24/195/1901 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524/08241102 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

0.000

Verification Standard Spiked  $0.2 \text{ ml of} \longrightarrow \uparrow 50 \text{ ml of pH adjusted DI Water (T.V.= } 0.04 \text{ ppm)}$   $\uparrow 10 \text{ ml of sample (T.V.=} 0.04 \text{ ppm)}$ 

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Prepared By:
Analyzed By:
Reviewed By:

Date/Time: 9/

0.000

0,000

0,0000 356

Date:

. ii	40	
· · · .	10/16/10	524-1006/001 25/33pp Stock for 03
**,	Ja -	Q.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
		10/46598 ;Exp: 8/11/p) up to 500 ml w/ DI Water.
,-		EXP: 10/20/10
-	10/blio	524-10061002 25133996 Jakev for 0=
		0.05 ml Pyridine-4-carboxaldenyde TEI
		( <i>IGTWC</i> ; Exp: 9/10/12) up to 500 ml w/ DI Water.
		EXP: 10/20/10
		mil 120/ 1000 20071 0/
	Inthation	524-1006/003 MBTH SO/17
	2	0.5000 g MBTH (Aldrich <u>54646t K</u> ; Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H <sub>2</sub> SO <sub>4</sub> EMO 44J84; EN 1/2
ţ		EXP: 10/7/10
:		
•	10/15/10	524-10151001 Orbt ICV/COV Stuck
		Purchased 100PM Crat
		FICCA Chemical Co Cut No 2095-16
! !		500ml 1/9StiC
		LOT# 10/0177 EXP: 3/20/2
نــ	10/15/10	524-10151002 SOPPM NOZ STOCK
		Purchased
3		RCA Chemical Co Cut No: 5444.5-4 LOTH 1010271 120 ml amber 9/455
		LOT# 1010271 120 ml amber 9/455

524-0221101 1:1H2504 1 (EMD 49284; EXP: 11/20) LY TO 250M D.I. (OD/ COMPLETERY 524-0221/102 Orbot Coloning Kenglin 0.2500g 1,5-0iphenyl Caubohydrazide (EMD 107 471037 EXP: 1/30/13) 1 50 Ml W/ACCHONI (EMD) LOT #47154D; EXP: 9/34/12). EXP: 3/91/11 534-0338/101 0./NH2SOY 5.6 ml Cone 1/2 Dy COMD 49284 OXP 11/20/14/1. W/DI HZO ext: 3/28/12 -0228/102 1001 11/1 ON6+ Inorganic Ventures CGCR (6)1-1 125 ml Clear Glass LOT# D2-CROBOGO AP: 3/1/2012

9/30/12 NH3 GUING SIN ga 4/26/11 142SUY (DMD 49284; EXP:11/20) ADDED SLOWLY TO 250M/ DILA LET COL. EXP: 4/26/ 6.25m (come HZSOY (OND 49 284; Oxf: 11/20/14 DISSOLVE, 1.68759 NN-DIMETLY J-DW OXWWH (Fulca 1363386 B408 Zod) OXP: 87/19 in world suffusic soin and dilute to 250ml 1:142504 (524-042611 by; Oxf: 4/36/12) EXP: 5/25/11

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JH 7.000 Buffer at No: BOH5046-500M 3/20/3 524-04281101 OIN HZSUY 5.6 ml Cone A2804 (enro 49.284; EXP: 1 21 W/DI HZD CXP: 4/28/12 524-05041101 Allaline Digestion Solu 20.09 NAOH (EMO 47022713; EXO: 10/11/12) + 30.09 9 NAZLO3 (EMD 46321715B; EXP: 10/11/12 16 WI DI HZO 524-05051101 What Coloring reasont 0.2500g 1,5-Diphenylcarbohydrazide GTBacy JOSG41; EXP: 06/15/15 1. 50 ml w/Alexand (END 47154 D; 14 5/5/11 524-05051102 ICOZ Elvent 100 ml 524-04191101 (10x une quent: EN: 9/22/11) 1 11 W/DI H20- Degassed

OI 524-05791103 ICOD PCR Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EM JW564) exp: 4/5/15) 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 49184 exp: 11/20/14). Bring up to volume w/ DI H2O; mix and degas. QP: 5/24/11 BOH CAT. No. BOH 5010-500 mL BDH CAT # BNHS058-500m L LOT# 1103360/ Dr. 3/2013

524-08241191, Sulfanilamide Soly 5.00g Suffanilamide (57 baller; los# J32618; EXP): 1/6/16 DISSOLVEDIN SOME CONC HC/ (EMD 49260; EXP. 2/7/16) 1 500 ml w/ DT How EXP. 8/24/12 HU S24-08241102 NEDA SOLVI 0.2500g N-1-Naphthy/ethylenediamine dihydrachloria (IT BAKER H22587, EXP: 10/19/14) 1 25 MW/DI 0-1N H2 SOY 5.6 ml Conc H2SOy (MD 49984; EXP: 11/20/14 1 2L N/OI H20 EXP: 8/29/12 10PM Crat Std 524-08291102 1.0 ml 524-0228/102 (10000pm Crist; EX1: 3/1/12) 1 100 ml D/DIH20 EXP: 3/28/12 524-199061101 (16+ Coloring Kengent 0.2500a 1,5-0; Meny/carbohydrazide PJT Biker Jo5641; EXP: 4/15/15) 50 ml w/ Allone (EMD 47154D) EXP: 9/24/12). EXP: 10/6/11