

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 24, 2003
LDC Report Date: April 2, 2003
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-1842

Sample Identification

DUPE-6-1Q03
DUPE-6-1Q03DL
MW-7
MW-8
MW-16
TB-13-2/24/03
MW-16MS
MW-16MSD

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/7/03	Bromomethane	33.31	DUPE-6-1Q03DL MW-8 MW-16 03G1661MB01	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
DUPE-6-1Q03DL	Bromofluorobenzene	139 (70-129)	All TCL compounds	J (all detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
DUPE-6-1Q03	Carbon tetrachloride	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

Samples DUPE-6-1Q03 and MW-7 and samples DUPE-6-1Q03DL and MW-7 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	DUPE-6-1Q03	MW-7	
Carbon tetrachloride	93.7	102	8
Chloroform	12.3	12.9	5
1,1-Dichloroethene	6.4	6.1	5
Tetrachloroethene	13.5	11.8	13
Trichloroethene	4.8	4.4	9
1,1,2-Trichloro-1,2,2-trifluoroethane	4.2	4.2	0

Compound	Concentration (ug/L)		RPD
	DUPE-6-1Q03DL	MW-7	
Carbon tetrachloride	122	102	18
Chloroform	16	12.9	21
Tetrachloroethene	15	11.8	24
Trichloroethene	5.8	4.4	27
1,1,2-Trichloro-1,2,2-trifluoroethane	5.2	4.2	21
1,1-Dichloroethene	8.1	6.1	28

XVII. Field Blanks

Sample TB-13-2/24/03 was identified as a trip blank. No volatile contaminants were found in this blank.

NASA JPL**Volatiles - Data Qualification Summary - SDG 03-1842**

SDG	Sample	Compound	Flag	A or P	Reason
03-1842	DUPE-6-1Q03DL MW-8 MW-16	Bromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
03-1842	DUPE-6-1Q03DL	All TCL compounds	J (all detects)	A	Surrogate spikes (%R)
03-1842	DUPE-6-1Q03	Carbon tetrachloride	J (all detects)	A	Compound quantitation and CRQLs

NASA JPL**Volatiles - Laboratory Blank Data Qualification Summary - SDG 03-1842**

No Sample Data Qualified in this SDG

10059D.

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
Sample ID: DUPE-6-1Q03	Lab Sample ID: 03-1842-1	Received Date: 02/24/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1639	Prep. Date: 03/05/03	Anal. Date: 03/05/03
Data File Name: 1842-01	Prep. No: -	Anal. Time: 19:44
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	93.7	E J
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	12.3	
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	1.1 ^(b)	<1.1	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	6.4	
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROETHENE (TOTAL)	540-59-0	µg/L	0.5	<0.5	U
32	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
33	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
34	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
35	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
36	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
37	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
38	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
39	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	0.5	<0.5	U
41	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
42	METHYLENE CHLORIDE	75-09-2	µg/L	1.8 ^(b)	<1.8	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
45	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
46	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
47	STYRENE	100-42-5	µg/L	0.5	<0.5	U
48	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
49	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
50	TETRACHLOROETHENE	127-18-4	µg/L	0.5	13.5	
51	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
52	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
53	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
54	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
55	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
56	TRICHLOROETHENE	79-01-6	µg/L	0.5	4.8	
57	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
58	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
59	112TRICHLORO-122TRIFLUOROETHANE	76-13-1	µg/L	0.5	4.2	
60	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
61	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
62	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
63	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
64	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Surrogates			Control Limit, %	Surro. Rec.%
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	100
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	87
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	74
4	TOLUENE-D8	2037-26-5	73-129	94
# of out-of-control				0

Internal Standard

Internal Standard			Control Limit, %	IS Rec.%
1	CHLORO BENZENE-D5	3114-55-4	50-200	103
2	1,4-DICHLORO BENZENE-D4	3855-82-1	50-200	98
3	FLUORO BENZENE	462-06-6	50-200	107
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(b)MDL reported.

Qualifier: U - Not Detected or less than MDL

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

E - Exceed calibration range

B - A positive value was found in the method blank

D - Diluted

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
	Lab Sample ID: 03-1842-1DL	Received Date: 02/24/2003
Sample ID: DUPE-6-1Q03	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 5030	Instrument ID: GC/MS: G
Anal. Method: 524.2	Prep. Date: 03/07/03	Anal. Date: 03/07/03
Batch No: 03G1661	Prep. No: -	Anal. Time: 19:10
Data File Name: 1842-01A	Sample Amount: 12.5 mL	Dilution Factor: 2
Methanol Vol. -		

Sparge Size: 25 mL Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	1	<1	U
2	BROMOBENZENE	108-86-1	µg/L	1	<1	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	1	<1	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	1	<1	U
5	BROMOFORM	75-25-2	µg/L	1	<1	U
6	BROMOMETHANE	74-83-9	µg/L	1	<1	U <i>UJ</i>
7	2-BUTANONE	78-93-3	µg/L	20	<20	U
8	N-BUTYLBENZENE	104-51-8	µg/L	1	<1	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	1	<1	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	1	<1	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	1	122	D <i>J</i>
12	CHLOROBENZENE	108-90-7	µg/L	1	<1	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	1	<1	U
14	CHLOROETHANE	75-00-3	µg/L	1	<1	U
15	CHLOROFORM	67-66-3	µg/L	1	16	D <i>J</i>
16	CHLOROMETHANE	74-87-3	µg/L	1	<1	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	1	<1	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	1	<1	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	2.2 ^(b)	<2.2	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	1	<1	U
21	DIBROMOMETHANE	74-95-3	µg/L	1	<1	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	1	<1	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	1	<1	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	1	<1	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	1	<1	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	1	<1	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	1	<1	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	1	8.1	D <i>J</i>
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	1	<1	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	1	<1	U
31	1,2-DICHLOROETHENE (TOTAL)	540-59-0	µg/L	1	<1	U
32	1,2-DICHLOROPROPANE	78-87-5	µg/L	1	<1	U
33	1,3-DICHLOROPROPANE	142-28-9	µg/L	1	<1	U
34	2,2-DICHLOROPROPANE	594-20-7	µg/L	1	<1	U
35	1,1-DICHLOROPROPENE	563-58-6	µg/L	1	<1	U
36	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	1	<1	U
37	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	1	<1	U
38	ETHYLBENZENE	100-41-4	µg/L	1	<1	U
39	HEXACHLOROBUTADIENE	87-68-3	µg/L	1	<1	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	1	<1	U
41	P-ISOPROPYLTOLUENE	99-87-6	µg/L	1	<1	U
42	METHYLENE CHLORIDE	75-09-2	µg/L	3.6 ^(b)	<3.6	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	2	<2	U
44	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	20	<20	U
45	NAPHTHALENE	91-20-3	µg/L	1	<1	U
46	N-PROPYLBENZENE	103-65-1	µg/L	1	<1	U
47	STYRENE	100-42-5	µg/L	1	<1	U
48	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	1	<1	U
49	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	1	<1	U
50	TETRACHLOROETHENE	127-18-4	µg/L	1	15	D J
51	TOLUENE	108-88-3	µg/L	1	<1	U
52	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	1	<1	U
53	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	1	<1	U
54	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	1	<1	U
55	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	1	<1	U
56	TRICHLOROETHENE	79-01-6	µg/L	1	5.8	D J
57	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	1	<1	U
58	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	1	<1	U
59	1,1,2,2-TETRACHLOROETHANE	76-13-1	µg/L	1	5.2	D J
60	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	1	<1	U
61	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	1	<1	U
62	VINYL CHLORIDE	75-01-4	µg/L	1	<1	U
63	O-XYLENE	95-47-6	µg/L	1	<1	U
64	M/P-XYLENE	108-38-3	µg/L	1	<1	U

Surrogates

		Control Limit, %	Surro. Rec.%
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	70-129	139
2	DIBROMOFLUOROMETHANE	70-129	113
3	1,2-DICHLOROETHANE-D4	70-122	96
4	TOLUENE-D8	73-129	127
# of out-of-control			1

Internal Standard

		Control Limit, %	IS Rec.%
1	CHLOROBENZENE-D5	50-200	73
2	1,4-DICHLOROBENZENE-D4	50-200	70
3	FLUOROBENZENE	50-200	76
# of out-of-control			0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(b)MDL reported.

Qualifier: U - Not Detected or less than MDL

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

E - Exceed calibration range

B - A positive value was found in the method blank

D - Diluted

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Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
Sample ID: MW-7	Lab Sample ID: 03-1842-2	Received Date: 02/24/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1639	Prep. Date: 03/05/03	Anal. Date: 03/05/03
Data File Name: 1842-02	Prep. No: -	Anal. Time: 20:13
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	102 ^(a)	
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	12.9	
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	1.1 ^(b)	<1.1	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	6.1	
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROETHENE (TOTAL)	540-59-0	µg/L	0.5	<0.5	U
32	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
33	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
34	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
35	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
36	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
37	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
38	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
39	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U

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#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	0.5	<0.5	U
41	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
42	METHYLENE CHLORIDE	75-09-2	µg/L	1.8 ^(b)	<1.8	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
45	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
46	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
47	STYRENE	100-42-5	µg/L	0.5	<0.5	U
48	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
49	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
50	TETRACHLOROETHENE	127-18-4	µg/L	0.5	11.8	
51	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
52	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
53	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
54	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
55	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
56	TRICHLOROETHENE	79-01-6	µg/L	0.5	4.4	
57	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
58	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
59	112TRICHLORO-122TRIFLUOROETHANE	76-13-1	µg/L	0.5	4.2	
60	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
61	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
62	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
63	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
64	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Surrogates			Control Limit, %	Surro. Rec.%
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	100
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	88
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	76
4	TOLUENE-D8	2037-26-5	73-129	94
# of out-of-control				0

Internal Standard

Internal Standard			Control Limit, %	IS Rec.%
1	CHLOROBENZENE-D5	3114-55-4	50-200	104
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	95
3	FLUOROBENZENE	462-06-6	50-200	105
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(a) Analysis with a dilution factor of 2.

^(b) MDL reported.

Qualifier: U - Not Detected or less than MDL

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

E - Exceed calibration range

B - A positive value was found in the method blank

D - Diluted

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Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
Sample ID: MW-8	Lab Sample ID: 03-1842-3	Received Date: 02/24/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1661	Prep. Date: 03/07/03	Anal. Date: 03/07/03
Data File Name: 1842-03A	Prep. No: -	Anal. Time: 17:44
Methanol Vol. -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U <i>UJ</i>
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	4.3	
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	1.1	
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	1.1 ^(b)	<1.1	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	0.5	<0.5	U

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#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	1.8 ^(b)	<1.8	U
42	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
43	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE	79-01-6	µg/L	0.5	2.6	
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	112TRICHLORO-122TRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec.%	
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4		70-129	107	
2	DIBROMOFLUOROMETHANE	1868-53-7		70-129	87	
3	1,2-DICHLOROETHANE-D4	17060-07-0		70-122	75	
4	TOLUENE-D8	2037-26-5		73-129	100	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	85	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	87	
3	FLUOROBENZENE	462-06-6		50-200	94	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(b)MDL reported.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

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Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
Sample ID: MW-16	Lab Sample ID: 03-1842-4	Received Date: 02/24/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1661	Prep. Date: 03/07/03	Anal. Date: 03/07/03
Data File Name: 1842-04A	Prep. No: -	Anal. Time: 18:12
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U <i>UJ</i>
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	1.4	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	2.3	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	1.1 ^(b)	<1.1	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	1.8 ^(b)	<1.8	U
42	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
43	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE	79-01-6	µg/L	0.5	0.4	J
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	112TRICHLORO-122TRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec.%	
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4		70-129	106	
2	DIBROMOFLUOROMETHANE	1868-53-7		70-129	88	
3	1,2-DICHLOROETHANE-D4	17060-07-0		70-122	77	
4	TOLUENE-D8	2037-26-5		73-129	98	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	91	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	94	
3	FLUOROBENZENE	462-06-6		50-200	98	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(b)MDL reported.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank
D - Diluted

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Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/24/2003
Project ID: JPL	Service ID: 31842	Collected by:
Sample ID: TB-13-2/24/03	Lab Sample ID: 03-1842-5	Received Date: 02/24/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1639	Prep. Date: 03/05/03	Anal. Date: 03/05/03
Data File Name: 1842-05	Prep. No: -	Anal. Time: 21:37
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	<0.5	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	1.1 ^(b)	<1.1	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	1.8 ^(b)	<1.8	U
42	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
43	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	112TRICHLORO-122TRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec.%	
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4		70-129	96	
2	DIBROMOFLUOROMETHANE	1868-53-7		70-129	86	
3	1,2-DICHLOROETHANE-D4	17060-07-0		70-122	75	
4	TOLUENE-D8	2037-26-5		73-129	91	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	97	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	94	
3	FLUOROBENZENE	462-06-6		50-200	101	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

^(b)MDL reported.

Qualifier: U - Not Detected or less than MDL

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

E - Exceed calibration range

B - A positive value was found in the method blank

D - Diluted

4/2/07

LDC #: 10059D1

VALIDATION COMPLETENESS WORKSHEET

SDG #: 03-1842

Level III

Laboratory: Applied P & Ch Laboratory

Date: 4-1-03

Page: 1 of 1

Reviewer: 2nd Reviewer: 

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-24-03
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD, r ²
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 1 + 3 D = 2 + 3
XVII.	Field blanks	ND	TB = 6

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

All H₂O's

1	1	DUPE-6-1Q03	11		21		31	
2	2	DUPE-6-1Q03DL	12		22		32	
3	1	MW-7	13		23		33	
4	2	MW-8	14		24		34	
5	2	MW-16	15		25		35	
6	1	TB-13-2/24/03	16		26		36	
7	1	MW-16MS	17		27		37	
8	1	MW-16MSD	18		28		38	
9	1	03G1639MB01	19		29		39	
10	2	03G1661MB01	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	Q. 1,2-Dichloropropane	GG. Xylenes, total	VW. Bromobenzene	MMM. Naphthalene
B. Bromomethane	R. cis-1,3-Dichloropropene	HH. Vinyl acetate	XX. 1,2,3-Trichloropropane	NNN. 1,2,3-Trichlorobenzene
C. Vinyl chloride	S. Trichloroethene	II. 2-Chloroethylvinyl ether	YY. n-Propylbenzene	OOO. 1,3,5-Trichlorobenzene
D. Chloroethane	T. Dibromochloromethane	JJ. Dichlorodifluoromethane	ZZ. 2-Chlorotoluene	PPP. trans-1,2-Dichloroethene
E. Methylene chloride	U. 1,1,2-Trichloroethane	KK. Trichlorofluoromethane	AAA. 1,3,5-Trimethylbenzene	QQQ. cis-1,2-Dichloroethene
F. Acetone	V. Benzene	LL. Methyl-tert-butyl ether	BBB. 4-Chlorotoluene	RRR. m,p-Xylenes
G. Carbon disulfide	W. trans-1,3-Dichloropropene	MM. 1,2-Dibromo-3-chloropropane	CCC. tert-Butylbenzene	SSS. o-Xylene
H. 1,1-Dichloroethene	X. Bromoform	NN. Diethyl ether	DDD. 1,2,4-Trimethylbenzene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane
I. 1,1-Dichloroethane	Y. 4-Methyl-2-pentanone	OO. 2,2-Dichloropropane	EEE. sec-Butylbenzene	UUU. Benzyl chloride
J. 1,2-Dichloroethene, total	Z. 2-Hexanone	PP. Bromochloromethane	FFF. 1,3-Dichlorobenzene	VVV. 4-Ethyltoluene
K. Chloroform	AA. Tetrachloroethene	QQ. 1,1-Dichloropropene	GGG. p-Isopropyltoluene	WWW. Ethanol
L. 1,2-Dichloroethane	BB. 1,1,2,2-Tetrachloroethane	RR. Dibromomethane	HHH. 1,4-Dichlorobenzene	XXX. Ethyl ether
M. 2-Butanone	CC. Toluene	SS. 1,3-Dichloropropane	III. n-Butylbenzene	
N. 1,1,1-Trichloroethane	DD. Chlorobenzene	TT. 1,2-Dibromoethane	JJJ. 1,2-Dichlorobenzene	
O. Carbon tetrachloride	EE. Ethylbenzene	UU. 1,1,1,2-Tetrachloroethane	KKK. 1,2,4-Trichlorobenzene	
P. Bromodichloromethane	FF. Styrene	VV. Isopropylbenzene	LLL. Hexachlorobutadiene	

Notes:

METHOD: GC/MS VOA (EPA Method 524.2)

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

☒ Y ☐ N ☐ N/A

Y(N) N/A

[illegible]

VALIDATION FINDINGS WORKSHEET

Surrogate Spikes

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ Y ☐ N ☐ N/A

[illegible]

70-130
70-130
70-130
70-130

(BFB) = Bromofluorobenzene
(DCB) = 1,2-Dichlorobenzene-d4
(TOL) = Toluene-d8
(DFM) = Dibromofluoromethane

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	Y	N	N/A
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV?	Y	N	N/A

[illegible]

Comments: See sample calculation verification worksheet for recalculations

LDC #: 10059D1
 SDG #: 03-1842

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A
Y N N/A

Were field duplicate pairs identified in this SDG?

Were target compounds detected in the field duplicate pairs?

Compound	Concentration (<u>ug/L</u>)		RPD
	1	3	
O	93.7	102	8
K	12.3	12.9	5
H	6.4	6.1	5
AA	13.5	11.8	13
S	4.8	4.4	9
TTT	4.2	4.2	0

Compound	Concentration (<u>ug/L</u>)		RPD
	2	3	
O	122	102	18
K	16	12.9	21
AA	15	11.8	24
S	5.8	4.4	27
TTT	5.2	4.2	21
H	8.1	6.1	28

Compound	Concentration ()		RPD

NASA JPL
Data Validation Reports
LDC# 10059

Wet Chemistry

LDC

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 18, 2003
LDC Report Date: April 1, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1694

Sample Identification

DUPE-5-1Q03
EB-10-2/18/03
MW-11-1
MW-11-2
MW-11-3
MW-11-4
MW-22-1
MW-22-2
MW-22-3
MW-22-1MS
MW-22-1MSD

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

Samples DUPE-5-1Q03 and MW-22-2 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	DUPE-5-1Q03	MW-22-2	
Perchlorate	2.0	4U	200

X. Field Blanks

Sample EB-10-2/18/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-1694

No Sample Data Qualified in this SDG

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1694

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31694

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1694-1	DUPE-5-1Q03	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-2	EB-10-2/18/03	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-3	MW-11-1	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-4	MW-11-2	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-5	MW-11-3	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-7	MW-22-1	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-8	MW-22-2	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03-1694-9	MW-22-3	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U
03W1576-MB-01	03W1576-MB-01	Water	02/18/03	02/18/03	02/18/03	03W1576	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

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4/2/03

Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31694

Anal. Method 314.0
Collected by:

Component Name: Perchlorate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1694-1	DUPE-5-1Q03	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	2.0	B
03-1694-2	EB-10-2/18/03	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	<4	U
03-1694-3	MW-11-1	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	2.4	B
03-1694-4	MW-11-2	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	3.6	B
03-1694-5	MW-11-3	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	3.1	B
03-1694-6	MW-11-4	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	4.8	
03-1694-7	MW-22-1	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	<4	U
03-1694-8	MW-22-2	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	<4	U
03-1694-9	MW-22-3	Water	02/18/03	02/18/03	02/20/03	03W1610	µg/L	4	<4	U
03W1610-MB-01	03W1610-MB-01	Water	02/20/03	02/20/03	02/20/03	03W1610	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

4/2/03

LDC #: 10059A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 03-1694

Level III

Laboratory: Applied P & Ch Laboratory

Date: 4/1/03

Page: 1 of 1

Reviewer: JH

2nd Reviewer: JH

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Cr(VI) (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: >1/8/03
IIa.	Initial calibration	ASR	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	3 MS/MCD
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,8)
X	Field blanks	ND	EB = 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	DUPE-5-1Q03	11	MW-22-1MSD	21		31	
2	EB-10-2/18/03	12	MB	22		32	
3	MW-11-1	13		23		33	
4	MW-11-2	14		24		34	
5	MW-11-3	15		25		35	
6	MW-11-4	16		26		36	
7	MW-22-1	17		27		37	
8	MW-22-2	18		28		38	
9	MW-22-3	19		29		39	
10	MW-22-1MS	20		30		40	

Notes: _____

Page: 1 of 1
Reviewer: MA
2nd reviewer: /

LDC #: 10059A6
SDG #: 03-1694

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MB
2nd reviewer: ✓

METHOD: Inorganics, Method See cover

☒ Y ☐ N ☐ N/A
☒ Y ☐ N ☐ N/A

Were field duplicate pairs identified in this SDG?
Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (<u>ug/l</u>)		RPD (Limit)	Difference (Limit)	Qualifier
	1	8			
<u>004</u>	<u>2.0</u>	<u>4 u</u>	<u>200</u>		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 19, 2003
LDC Report Date: April 1, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-1724

Sample Identification

MW-5
MW-5MS
MW-5MSD

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-1724

No Sample Data Qualified in this SDG

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1724

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4432.10
Service ID: 31724

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1724-1	MW-5	Water	02/10/03	02/19/03	02/19/03	03W1599	mg/L	0.01	<0.01	U
03W1599-MB-01	03W1599-MB-01	Water	02/19/03	02/19/03	02/19/03	03W1599	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

4/2/03

Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4432.10
Service ID: 31724

Anal. Method 314.0
Collected by:

Component Name: Perchlorate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1724-1	MW-5	Water	02/10/03	02/19/03	02/20/03	03W1610	µg/L	4	25.2	
03W1610-MB-01	03W1610-MB-01	Water	02/20/03	02/20/03	02/20/03	03W1610	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

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LDC #: 10059B6

SDG #: 03-1724

Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 4/1/03

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Cr (VI) (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2/19/03
IIa.	Initial calibration	SW A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	A	} MS/MSD
V.	Duplicates	A	
VI.	Laboratory control samples	A	LCG/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	MW-5	11		21		31	
2	MW-5MS	12		22		32	
3	MW-5MSD	13		23		33	
4	MB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

All circled methods are applicable to each sample.

[illegible]

Comments:

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 20, 2003
LDC Report Date: April 1, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-1767

Sample Identification

MW-6
MW-10
MW-13
MW-15

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) analyses specified for the samples in this SDG, and therefore matrix spike analyses were not performed for this SDG.

V. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-1767

No Sample Data Qualified in this SDG

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1767

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.

Project No: 04-4428.10

Anal. Method 314.0

Project ID: JPL

Service ID: 31767

Collected by:

Component Name: Perchlorate

CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1767-1	MW-6	Water	02/20/03	02/20/03	02/21/03	03W1610	µg/L	4	3.8	B
03-1767-2	MW-10	Water	02/20/03	02/20/03	02/21/03	03W1610	µg/L	4	3.5	B
03-1767-3	MW-13	Water	02/20/03	02/20/03	02/21/03	03W1610	µg/L	4	68.1	
03W1610-MB-01	03W1610-MB-01	Water	02/20/03	02/20/03	02/20/03	03W1610	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

1/9/07

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31767

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1767-1	MW-6	Water	02/20/03	02/20/03	02/21/03	03W1623	mg/L	0.01	<0.01	U
03-1767-2	MW-10	Water	02/20/03	02/20/03	02/21/03	03W1623	mg/L	0.01	<0.01	U
03-1767-3	MW-13	Water	02/20/03	02/20/03	02/21/03	03W1623	mg/L	0.01	0.055	
03-1767-4	MW-15	Water	02/20/03	02/20/03	02/21/03	03W1623	mg/L	0.01	<0.01	U
03W1623-MB-01	03W1623-MB-01	Water	02/21/03	02/21/03	02/21/03	03W1623	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

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LDC #: 10059C6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 03-1767

Level III

Laboratory: Applied P & Ch Laboratory

Date: 4/1/03

Page: 1 of 1

Reviewer: MH

2nd Reviewer: *[Signature]***METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Cr (VI) (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2/20/03
IIa.	Initial calibration	ASW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	3 client specified
V	Duplicates	N	
VI.	Laboratory control samples	A	Los/less
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

1	MW-6	11		21		31	
2	MW-10	12		22		32	
3	MW-13	13		23		33	
4	MW-15	14		24		34	
5	LB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 24, 2003
LDC Report Date: April 1, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1842

Sample Identification

DUPE-6-1Q03
MW-7
MW-8
MW-16
MW-16MS
MW-16MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

Samples DUPE-6-1Q03 and MW-7 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	DUPE-6-1Q03	MW-7	
Perchlorate	6190	5200	17

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-1842

No Sample Data Qualified in this SDG

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1842

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31842

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1842-1	DUPE-6-1Q03	Water	02/24/03	02/24/03	02/25/03	03W1675	mg/L	0.01	<0.01	U
03-1842-2	MW-7	Water	02/24/03	02/24/03	02/25/03	03W1675	mg/L	0.01	<0.01	U
03-1842-3	MW-8	Water	02/24/03	02/24/03	02/25/03	03W1675	mg/L	0.01	<0.01	U
03-1842-4	MW-16	Water	02/24/03	02/24/03	02/25/03	03W1675	mg/L	0.01	0.020	
03W1675-MB-01	03W1675-MB-01	Water	02/25/03	02/25/03	02/25/03	03W1675	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.



Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31842

Anal. Method 314.0
Collected by:

Component Name: Perchlorate

CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1842-1	DUPE-6-1Q03	Water	02/24/03	02/24/03	02/26/03	03W1676	µg/L	400	6190	
03-1842-2	MW-7	Water	02/24/03	02/24/03	02/26/03	03W1676	µg/L	400	5200	
03-1842-3	MW-8	Water	02/24/03	02/24/03	02/26/03	03W1676	µg/L	4	45.0	
03-1842-4	MW-16	Water	02/24/03	02/24/03	02/26/03	03W1676	µg/L	4	97.2	
03W1676-MB-01	03W1676-MB-01	Water	02/25/03	02/25/03	02/25/03	03W1676	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

Handwritten signature/initials

LDC #: 10059D6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 03-1842

Level III

Laboratory: Applied P & Ch Laboratory

Date: 4/1/03

Page: 1 of 1

Reviewer: MW

2nd Reviewer: 6

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Cr (VI) (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2/24/03
IIa.	Initial calibration	A SWP	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	7 MS / MSD
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS / LCS
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1, 2)
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

1	DUPE-6-1Q03	11		21		31	
2	MW-7	12		22		32	
3	MW-8	13		23		33	
4	MW-16	14		24		34	
5	MW-16MS	15		25		35	
6	MW-16MSD	16		26		36	
7	MB	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

All circled methods are applicable to each sample.

[illegible]

Comments:

LDC #: 1005976
SDG #: 03-184 ✓

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MB
2nd reviewer: ll

METHOD: Inorganics, Method See cover

☒ Y ☐ N ☐ N/A
☒ Y ☐ N ☐ N/A

Were field duplicate pairs identified in this SDG?
Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (<u>ug/l</u>)		RPD (Limit)	Difference (Limit)	Qualifier
	<u>1</u>	<u>2</u>			
<u>ce04</u>	<u>6190</u>	<u>5200</u>	<u>17</u>		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier