

**NASA JPL
Data Validation Reports
LDC# 10822**

Wet Chemistry

LDC

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

Project/Site Name: NASA JPL
Collection Date: July 29, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-4389

Sample Identification

EB-1-7-29-03
MW-21-1
MW-21-2
MW-21-3
MW-21-4
MW-21-5
MW-21-1MS
MW-21-1MSD

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 314.0 for Perchlorate and EPA SW 846 Method 7196A 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

Sample EB-1-7-29-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-4389

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4389

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: 34389

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
03-4389-1	EB-1-7-29-03	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03-4389-2	MW-21-1	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03-4389-3	MW-21-2	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03-4389-4	MW-21-3	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03-4389-5	MW-21-4	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03-4389-6	MW-21-5	Water	07/29/03	07/29/03	07/29/03	03W3899	mg/L	0.01	<0.01	U
03W3899-MB-01	03W3899-MB-01	Water	07/29/03	07/29/03	07/29/03	03W3899	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.

19/02

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: 34389

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
03-4389-1	EB-1-7-29-03	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	<4	U
03-4389-2	MW-21-1	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	5.2	
03-4389-3	MW-21-2	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	2.1	B
03-4389-4	MW-21-3	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	2.7	B
03-4389-5	MW-21-4	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	2.7	B
03-4389-6	MW-21-5	Water	07/29/03	07/29/03	07/31/03	03W3913	µg/L	4	2.6	B
03W3913-MB-01	03W3913-MB-01	Water	07/31/03	07/31/03	07/31/03	03W3913	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.

19/82

LDC #: 10822A6
 SDG #: 03-4389
 Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 9/17/03
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (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: <u>9/29/03</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	<u>3MS/MSD</u>
V	Duplicates	A	
VI.	Laboratory control samples	A	<u>LCS/LCSD</u>
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	ND	<u>EB = 1</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: [Signature]

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

Notes: _____

LDC #: 10822 AB
 SDG #: 03-4289

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
 Reviewer: MIT
 2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
<u>1-6</u>	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC <u>CR⁶⁺</u> <u>ClO₄</u> _____
<u>09.8</u>	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC <u>CR⁶⁺</u> _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____

Comments: _____

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

Project/Site Name: NASA JPL
Collection Date: July 30, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-4406

Sample Identification

DUPE-1-3Q03
EB-2-7/30-03
MW-3-2
MW-3-3
MW-3-4
MW-17-2
MW-17-3
MW-17-4
MW-19-1
MW-19-2
MW-19-3
MW-19-4
MW-19-5
MW-3-3MS
MW-3-3MSD
MW-19-2MS
MW-19-2MSD

Introduction

This data review covers 17 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 SW 846 Method 7196A 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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
7/31/03	CCV (13:18)	Perchlorate	111 (90-110)	DUPE-1-3Q03 EB-2-7/30-03 MW-3-2 MW-3-3 MW-3-4 MW-17-2 MW-17-3 MW-19-2MS MW-19-2MSD	J (all detects)	P
7/31/03	CCV (16:40)	Perchlorate	111 (90-110)	MW-17-4 MW-19-1 MW-19-2 MW-19-3 MW-19-4 MW-19-5	J (all detects)	P

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-1-3Q03 and MW-19-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

X. Field Blanks

Sample EB-2-7/30-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-4406

SDG	Sample	Analyte	Flag	A or P	Reason
03-4406	DUPE-1-3Q03 EB-2-7/30-03 MW-3-2 MW-3-3 MW-3-4 MW-17-2 MW-17-3 MW-17-4 MW-19-1 MW-19-2 MW-19-3 MW-19-4 MW-19-5	Perchlorate	J (all detects)	P	Calibration verification (%R)

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4406

No Sample Data Qualified in this SDG

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: 34406

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
03-4406-1	DUPE-1-3Q03	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-2	EB-2-7/30/03	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-3	MW-3-2	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	8.9	U
03-4406-4	MW-3-3	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-5	MW-3-4	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-6	MW-17-2	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	10.9	U
03-4406-7	MW-17-3	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	20	209	U
03-4406-8	MW-17-4	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-9	MW-19-1	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-10	MW-19-2	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	3.6	B
03-4406-11	MW-19-3	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	3.0	B
03-4406-12	MW-19-4	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03-4406-13	MW-19-5	Water	07/30/03	07/30/03	07/31/03	03W3913	µg/L	4	<4	U
03W3913-MB-01	03W3913-MB-01	Water	07/31/03	07/31/03	07/31/03	03W3913	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.

19182

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
 Project ID: JPL

Project No: 04-4428.10
 Service ID: 34406

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
03-4406-3	MW-3-2	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03-4406-4	MW-3-3	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03-4406-5	MW-3-4	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03-4406-6	MW-17-2	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03-4406-7	MW-17-3	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03-4406-8	MW-17-4	Water	07/30/03	07/30/03	07/30/03	03W3907	mg/L	0.01	<0.01	U
03W3907-MB-01	03W3907-MB-01	Water	07/30/03	07/30/03	07/30/03	03W3907	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.

19/82

LDC #: 10822B6

VALIDATION COMPLETENESS WORKSHEET

Date: 9/17/03

SDG #: 03-4406

Level III

Page: (of 1)

Laboratory: Applied P & Ch Laboratory

Reviewer: *hms*2nd Reviewer: *A***METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (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: 7/30/03
Ila.	Initial calibration	A	
Ilb.	Calibration verification	GW	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	3 MS / MSD
V	Duplicates	A	
VI.	Laboratory control samples	A	LCs / LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	(1, 12)
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: *A*

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

Notes: _____

LDC #: 10822 B6
SDG #: 03-4406

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: 

All circled methods are applicable to each sample.

Sample ID	Parameter
1-13	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CO₂ ^{CO₂}
3-8	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁰
oc 14, 15	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁰
✓ 16, 17	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺ ^{CO₂}
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁺

Comments: _____

VALIDATION FINDINGS WORKSHEET Calibration

METHOD: Inorganics, EPA Method See com

- Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
 Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?
 Y N N/A Are all correlation coefficients ≥ 0.995 ?

LEVEL I/VD ONLY:

- Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.
 Y N N/A Was a balance check conducted prior to the TDS analysis?
 Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	17/31/03	CCV (13218)	clouy	111	1-7, 16, 17	J Loh / P
2	↓	CCV (16240)	clouy	111	8-13	↓

Comments:

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

Project/Site Name: NASA JPL
Collection Date: July 31, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-4425

Sample Identification

DUPE-2-3-Q03
EB-3-7-31-03
MW-20-1
MW-20-2
MW-20-3
MW-20-4
MW-20-5
MW-20-4MS
MW-20-4MSD

Introduction

This data review covers 9 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 SW 846 Method 7196A 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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
8/1/03	CCV (12:00)	Perchlorate	113 (90-110)	DUPE-2-3-Q03 EB-3-7-31-03 MW-20-4 MB LCS	J (all detects)	P
8/1/03	CCV (15:23)	Perchlorate	113 (90-110)	MW-20-1 MW-20-2 MW-20-3 MW-20-5 MW-20-4MS MW-20-4MSD	J (all detects)	P

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-2-3-Q03 and MW-20-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

X. Field Blanks

Sample EB-3-7-31-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-4425

SDG	Sample	Analyte	Flag	A or P	Reason
03-4425	DUPE-2-3-Q03 EB-3-7-31-03 MW-20-1 MW-20-2 MW-20-3 MW-20-4 MW-20-5	Perchlorate	J (all detects)	P	Calibration verification (%R)

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4425

No Sample Data Qualified in this SDG

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: 34425

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
03-4425-1	DUPE-2-3-Q03	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03-4425-2	EB-3-7-31-03	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03-4425-3	MW-20-1	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	1.5	J ✓
03-4425-4	MW-20-2	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03-4425-5	MW-20-3	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03-4425-6	MW-20-4	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03-4425-7	MW-20-5	Water	07/31/03	07/31/03	08/01/03	03W3930	µg/L	4	<4	U
03W3930-MB-01	03W3930-MB-01	Water	08/01/03	08/01/03	08/01/03	03W3930	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.

19/02

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
 Project ID: JPL

Project No: 04-4428.10
 Service ID: 34425

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
03-4425-1	DUPE-2-3-Q03	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-2	EB-3-7-31-03	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-3	MW-20-1	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-4	MW-20-2	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-5	MW-20-3	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-6	MW-20-4	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03-4425-7	MW-20-5	Water	07/31/03	07/31/03	08/01/03	03W3919	mg/L	0.01	<0.01	U
03W3919-MB-01	03W3919-MB-01	Water	08/01/03	08/01/03	08/01/03	03W3919	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 #: 10822C6

VALIDATION COMPLETENESS WORKSHEET

Date: 9/17/03

SDG #: 03-4425

Level III

Page: 1 of 1

Laboratory: Applied P & Ch Laboratory

Reviewer: MB

2nd Reviewer: A

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (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: 7/30/03
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	} MS/MSD
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	(1, 5)
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: MB

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

Notes: _____

LDC #: 10822C6
SDG #: 03-4425

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
1-17	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC (CR ⁶⁺) (ClO ₂)
029,10	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC (CR ⁶⁺) (ClO ₂)
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺

Comments: _____

LDC #: 10822-C6
 SDG #: 03-4425

VALIDATION FINDINGS WORKSHEET

Calibration

Page: of
 Reviewer: MH
 2nd Reviewer:

METHOD: Inorganics, EPA Method see crown

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y N N/A
 Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
 Y N N/A
 Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?
 Y N N/A
 Are all correlation coefficients ≥ 0.995 ?

LEVEL I/VD ONLY:
 Y N N/A
 Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.
 Y N N/A
 Was a balance check conducted prior to the TDS analysis?
 Y N N/A
 Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	8/1/03	CCV (1200)	ClO4	113	1, 2, 6, MR, LCS	JDt/Sp
2	8/1/03	CCV (523)	ClO4	113	3, 4, 5, 7, 9, 10	↓

Comments: _____

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

Project/Site Name: NASA JPL
Collection Date: August 4, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-4455

Sample Identification

DUPE-3-3-Q03
EB-4-8-4-03
MW-4-1
MW-4-2
MW-4-3
MW-18-2
MW-18-3
MW-18-4
MW-18-5
MW-4-2MS
MW-4-2MSD

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 SW 846 Method 7196A 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-3-3-Q03 and MW-4-1 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

X. Field Blanks

Sample EB-4-8-4-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-4455

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4455

No Sample Data Qualified in this SDG

10072D

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 34455

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
03-4455-1	DUPE-3-3-Q03	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-2	EB-4-8-4-03	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-3	MW-4-1	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-4	MW-4-2	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-5	MW-4-3	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-6	MW-18-2	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-7	MW-18-3	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03-4455-8	MW-18-4	Water	08/04/03	08/04/03	08/04/03	03W3944	mg/L	0.01	<0.01	U
03W3944-MB-01	03W3944-MB-01	Water	08/04/03	08/04/03	08/04/03	03W3944	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.

1918

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: 34455

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
03-4455-1	DUPE-3-3-Q03	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03-4455-2	EB-4-8-4-03	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03-4455-3	MW-4-1	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03-4455-4	MW-4-2	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	9.0	U
03-4455-5	MW-4-3	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03-4455-6	MW-18-2	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03-4455-7	MW-18-3	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	1.3	J U
03-4455-8	MW-18-4	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	15.0	U
03-4455-9	MW-18-5	Water	08/04/03	08/04/03	08/05/03	03W3948	µg/L	4	<4	U
03W3948-MB-01	03W3948-MB-01	Water	08/05/03	08/05/03	08/05/03	03W3948	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.

1918

LDC #: 10822D6

VALIDATION COMPLETENESS WORKSHEET

Date: 9/17/03

SDG #: 03-4455

Level III

Page: 1 of 1

Laboratory: Applied P & Ch Laboratory

Reviewer: mb

2nd Reviewer: [Signature]

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (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: 8/4/03
IIa.	Initial calibration	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	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	(1,3)
X	Field blanks	ND	EB=2

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: AD

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

Notes: _____

LDC #: 10822
SDG #: 03-

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
1-8	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC <u>CR⁶⁺</u> <u>Clay</u>
9	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC <u>CR⁶⁺</u> <u>Clay</u>
10, 11	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC <u>CR⁶⁺</u> <u>Clay</u>
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺

Comments: _____

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

Project/Site Name: NASA JPL
Collection Date: August 6, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-4509

Sample Identification

DUPE-4-3-Q03
ER-5-8-6-03
MW-23-1
MW-23-2
MW-23-3
MW-23-4
MW-14-1
MW-14-2
MW-14-3
MW-14-4
MW-14-2MS
MW-14-2MSD

Introduction

This data review covers 12 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 SW 846 Method 7196A 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-4-3-Q03 and MW-14-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	DUPE-4-3-Q03	MW-14-3	
Perchlorate	2.3	3.0	26

X. Field Blanks

Sample ER-5-8-6-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-4509

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4509

No Sample Data Qualified in this SDG

109002E

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: 34509

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
03-4509-1	DUPE-4-3-Q03	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	2.3	J
03-4509-2	ER-5-8-6-03	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	<4	U
03-4509-3	MW-23-1	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	2.4	J
03-4509-4	MW-23-2	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	4.7	
03-4509-5	MW-23-3	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	2.0	J
03-4509-7	MW-14-1	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	3.8	J
03-4509-8	MW-14-2	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	5.4	
03-4509-9	MW-14-3	Water	08/06/03	08/06/03	08/06/03	03W3974	µg/L	4	3.0	J
03W3974-MB-01	03W3974-MB-01	Water	08/06/03	08/06/03	08/06/03	03W3974	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.

19182

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
 Project ID: JPL

Project No: 04-4428.10
 Service ID: 34509

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
03-4509-1	DUPE-4-3-Q03	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-2	ER-5-8-6-03	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-3	MW-23-1	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-4	MW-23-2	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-5	MW-23-3	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-6	MW-23-4	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-7	MW-14-1	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-8	MW-14-2	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-9	MW-14-3	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03-4509-10	MW-14-4	Water	08/06/03	08/06/03	08/06/03	03W3982	mg/L	0.01	<0.01	U
03W3982-MB-01	03W3982-MB-01	Water	08/06/03	08/06/03	08/06/03	03W3982	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.

9/18

LDC #: 10822E6

VALIDATION COMPLETENESS WORKSHEET

Date: 9/19/03

SDG #: 03-4509

Level III

Page: 1 of 1

Laboratory: Applied P & Ch Laboratory

Reviewer: MW

2nd Reviewer: [Signature]

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (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: 8/6/03
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	3 MS / MSD
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS / LCSN
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1, 2)
X	Field blanks	NB	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-4-3-Q03	11	MW-14-2MS	21		31	
2	ER-5-8-6-03	12	MW-14-2MSD	22		32	
3	MW-23-1	13	MB	23		33	
4	MW-23-2	14		24		34	
5	MW-23-3	15		25		35	
6	MW-23-4	16		26		36	
7	MW-14-1	17		27		37	
8	MW-14-2	18		28		38	
9	MW-14-3	19		29		39	
10	MW-14-4	20		30		40	

Notes: _____

LDC #: 10822
 SDG #: 03-

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
5, 9-9	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC <u>CR⁶⁺</u> <u>CO₂</u> _____
6, 10	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC <u>CR⁶⁺</u> _____
2011, 12	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC <u>CR⁶⁺</u> <u>CO₂</u> _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
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	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ _____

Comments: _____

LDC #: 10822Eb
 SDG #: 03-4509

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

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

METHOD: Inorganics, Method see over

Y N N/A Were field duplicate pairs identified in this SDG?
 Y N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (<i>ug/l</i>)		RPD (Limits)	Qualifier
	1	9		
<i>CO4</i>	<i>2.3</i>	<i>3.0</i>	<i>26</i>	

Analyte	Concentration ()		RPD (Limits)	Qualifier

Analyte	Concentration ()		RPD (Limits)	Qualifier

Analyte	Concentration ()		RPD (Limits)	Qualifier

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

Project/Site Name: NASA JPL
Collection Date: August 7, 2003
LDC Report Date: September 18, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-4534

Sample Identification

EB-6-8-7-03
MW-11-1
MW-11-2
MW-11-3
MW-11-4
MW-14-4
MW-14-5
MW-24-1
MW-24-2
MW-24-3
MW-24-4
MW-11-1MS
MW-11-1MSD
MW-11-4MS
MW-11-4MSD

Introduction

This data review covers 15 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 SW 846 Method 7196A 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

Sample EB-6-8-7-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-4534

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4534

No Sample Data Qualified in this SDG

108227

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: 34534

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
03-4534-1	EB-6-8-7-03	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-2	MW-11-1	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-3	MW-11-2	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-4	MW-11-3	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-5	MW-11-4	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-6	MW-14-4	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	2.3	J
03-4534-7	MW-14-5	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03-4534-8	MW-24-1	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	400	2450	
03-4534-9	MW-24-2	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	20	148	
03-4534-10	MW-24-3	Water	08/07/03	08/07/03	08/07/03	03W3998	µg/L	4	<4	U
03W3998-MB-01	03W3998-MB-01	Water	08/07/03	08/07/03	08/07/03	03W3998	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.

19/12

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
 Project ID: JPL

Project No: 04-4428.10
 Service ID: 34534

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
03-4534-2	MW-11-1	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-3	MW-11-2	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-4	MW-11-3	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-8	MW-24-1	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-9	MW-24-2	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-10	MW-24-3	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03-4534-11	MW-24-4	Water	08/07/03	08/07/03	08/07/03	03W3997	mg/L	0.01	<0.01	U
03W3997-MB-01	03W3997-MB-01	Water	08/07/03	08/07/03	08/07/03	03W3997	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.

19/82

LDC #: 10822F6

VALIDATION COMPLETENESS WORKSHEET

Date: 9/17/03

SDG #: 03-4534

Level III

Page: 1 of 1

Laboratory: Applied P & Ch Laboratory

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: (Analyte) Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A) Total Recoverable Petroleum Hydrocarbons (EPA Method 418.1)

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: 8/17/03
IIa.	Initial calibration	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	LCs/LCSB
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	ND	EB=1

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: [Signature]

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

Notes: _____

LDC #: 10822 Tb
SDG #: 03-4834

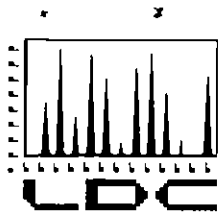
VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: M H
2nd reviewer: *[Signature]*

All circled methods are applicable to each sample.

Sample ID	Parameter
1-10	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ <i>(C04)</i>
2-4, 8-11	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
<i>oc 12, 13</i>	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ <i>(C04)</i>
<i>✓ 14, 15</i>	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ <i>(C04)</i>
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺
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	pH TDS Cl F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺

Comments: _____



LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Geofon, Inc.
22632 Golden Springs Drive, Suite 270
Diamond Bar, CA 91765
ATTN: Mr. Leo Williamson

October 20, 2003

SUBJECT: NASA JPL, DO #01, Data Validation

Dear Mr. Williamson,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on October 6, 2003. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 10962:

<u>SDG #</u>	<u>Fraction</u>
03-4445, 03-4558, 03-4572, 03-4842, 03-4854, 03-4878	Volatiles, Chromium, Wet Chemistry

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

**NASA JPL
Data Validation Reports
LDC# 10962**

Volatiles

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

Project/Site Name: NASA JPL
Collection Date: August 11, 2003
LDC Report Date: October 15, 2003
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory
Sample Delivery Group (SDG): 03-4572

Sample Identification

DUPE-5-3-Q03
EB-7-8-11-03
MW-12-1
MW-12-2
MW-12-3
MW-12-4
MW-12-5
MW-22-1
MW-22-2
MW-22-3
TB-7-8-11-03
MW-12-4MS
MW-12-4MSD

Introduction

This data review covers 13 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
8/11/03	Bromomethane	36.22	All samples in SDG 03-4572	J (all detects) UJ (all non-detects)	P

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.

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

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-5-3-Q03 and MW-22-2 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	DUPE-5-3-Q03	MW-22-2	
4-Methyl-2-pentanone	0.4	0.6	40

XVII. Field Blanks

Sample TB-7-8-11-03 was identified as a trip blank. No volatile contaminants were found in this blank with the following exceptions:

Trip Blank ID	Compound	Concentration (ug/L)
TB-7-8-11-03	Methylene chloride	0.4

Sample EB-7-8-11-03 was identified as an equipment blank. No volatile contaminants were found in this blank.

NASA JPL
Volatiles - Data Qualification Summary - SDG 03-4572

SDG	Sample	Compound	Flag	A or P	Reason
03-4572	DUPE-5-3-Q03 EB-7-8-11-03 MW-12-1 MW-12-2 MW-12-3 MW-12-4 MW-12-5 MW-22-1 MW-22-2 MW-22-3 TB-7-8-11-03	Bromomethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG 03-4572

No Sample Data Qualified in this SDG

10962C

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: DUPE-5-3-Q03	Lab Sample ID: 03-4572-1	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-01	Prep. No: -	Anal. Time: 16:24
Methanol Vol. -	Sample Amount: 25.0 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 UJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	0.5	<0.5	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	0.5	<0.5	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	0.4	J
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	1,1,2,2-TETRACHLOROETHANE	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	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	113
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	110
4	TOLUENE-D8	2037-26-5	73-129	97
# of out-of-control				0

Internal Standard		Control Limit, %	IS Rec. %	
1	CHLOROBENZENE-D5	3114-55-4	50-200	95
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	94
3	FLUOROBENZENE	462-06-6	50-200	86
# of out-of-control				0

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

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

10/18/02

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: EB-7-8-11-03	Lab Sample ID: 03-4572-2	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-02	Prep. No: -	Anal. Time: 16:50
Methanol Vol. -	Sample Amount: 25.0 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 UJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	0.5	<0.5	U
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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
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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

9/10/18/03
2416

#	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	0.5	<0.5	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-TRICHLOROENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROENZENE	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	1,1,2-TRICHLORO-1,1,2,2,2-TRIFLUOROETHANE	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	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	113
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	109
4	TOLUENE-D8	2037-26-5	73-129	97
#	of out-of-control			0

Internal Standard

		Control Limit, %	IS Rec. %	
1	CHLOROBENZENE-D5	3114-55-4	50-200	93
2	1,4-DICHLOROENZENE-D4	3855-82-1	50-200	92
3	FLUOROBENZENE	462-06-6	50-200	86
#	of out-of-control			0

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

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

10/18/02

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-12-1	Lab Sample ID: 03-4572-3	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-03	Prep. No: -	Anal. Time: 17:17
Methanol Vol: -	Sample Amount: 25.0 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 NJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	< 0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	< 0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	< 0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	< 10	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	0.5	< 0.5	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	0.5	<0.5	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	1,1,2,2-TETRACHLOROETHANE	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	97
2	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	114
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	110
4	TOLUENE-D8	2037-26-5	73-129	96
#	of out-of-control			0

Internal Standard

		Control Limit, %	IS Rec. %	
1	CHLOROBENZENE-D5	3114-55-4	50-200	94
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	93
3	FLUOROBENZENE	462-06-6	50-200	85
#	of out-of-control			0

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

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

10/18/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-12-2	Lab Sample ID: 03-4572-4	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-04	Prep. No: -	Anal. Time: 17:43
Methanol Vol: -	Sample Amount: 25.0 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 UJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	0.3	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	<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	0.5	<0.5	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-DICHLOROETHANE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROETHANE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROETHANE	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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 2420

#	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	0.5	<0.5	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	1,1,2,2-TETRACHLOROETHANE	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	97
2	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	114
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	112
4	TOLUENE-D8	2037-26-5	73-129	96
# of out-of-control				0

Internal Standard

		Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4	50-200	94
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	92
3	FLUOROBENZENE	462-06-6	50-200	85
# of out-of-control				0

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

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

10/10/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-12-3	Lab Sample ID: 03-4572-5	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-05	Prep. No: -	Anal. Time: 18:10
Methanol Vol: -	Sample Amount: 25.0 mL	Dilution Factor: 1
Test Level: Low	Spurge 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	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	5.1	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	1.7	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	0.5	<0.5	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	0.5	<0.5	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	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	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	97
2	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	115
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	113
4	TOLUENE-D8	2037-26-5	73-129	97
# of out-of-control			0	

Internal Standard

		Control Limit, %	IS Rec. %	
1	CHLOROBENZENE-D5	3114-55-4	50-200	93
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	93
3	FLUOROBENZENE	462-06-6	50-200	85
# of out-of-control			0	

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

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

10/18/07

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-12-4	Lab Sample ID: 03-4572-6	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-06	Prep. No: -	Anal. Time: 18:36
Methanol Vol: -	Sample Amount: 25.0 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	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	1.6	
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	0.6	
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	0.5	<0.5	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

9/10/18/03

#	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	0.5	<0.5	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	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	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	97
2	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	114
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	111
4	TOLUENE-D8	2037-26-5	73-129	97
# of out-of-control				0

Internal Standard

		Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4	50-200	93
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	92
3	FLUOROBENZENE	462-06-6	50-200	84
# of out-of-control				0

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

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

9/10/18/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-12-5	Lab Sample ID: 03-4572-7	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-07	Prep. No: -	Anal. Time: 19:03
Methanol Vol: -	Sample Amount: 25.0 mL	Dilution Factor: 1
Test Level: Low	Spurge 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	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	0.9	
12	CHLOROENZENE	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	0.5	<0.5	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	0.5	<0.5	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	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	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	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	113
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	112
4	TOLUENE-D8	2037-26-5	73-129	97
# of out-of-control				0

Internal Standard			Control Limit, %	IS Rec.%
1	CHLOROBENZENE-D5	3114-55-4	50-200	93
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	92
3	FLUOROBENZENE	462-06-6	50-200	84
# of out-of-control				0

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

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

10/18/02

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-22-1	Lab Sample ID: 03-4572-8	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-08	Prep. No: -	Anal. Time: 19:29
Methanol Vol. -	Sample Amount: 25.0 mL	Dilution Factor: 1
Test Level: Low	Spurge 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	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	0.5	<0.5	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	0.3	J
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	0.5	<0.5	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	0.4	J
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	0.9	
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROENZENE	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	0.3	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	1,1,2,2-TETRACHLOROETHANE	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	1,2-DICHLOROETHANE-D4	17060-07-0		70-129	115	
3	DIBROMOFLUOROMETHANE	1868-53-7		70-122	112	
4	TOLUENE-D8	2037-26-5		73-129	97	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	93	
2	1,4-DICHLOROENZENE-D4	3855-82-1		50-200	91	
3	FLUOROBENZENE	462-06-6		50-200	84	
# of out-of-control					0	

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

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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10/18/02

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-22-2	Lab Sample ID: 03-4572-9	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-09	Prep. No: -	Anal. Time: 19:55
Methanol Vol: -	Sample Amount: 25.0 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 NJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	0.5	<0.5	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

10/18/03

#	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	0.5	<0.5	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	0.6	J
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	97
2	1,2-DICHLOROETHANE-D4	17060-07-0	70-129	115
3	DIBROMOFLUOROMETHANE	1868-53-7	70-122	113
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	93
2	1,4-DICHLOROETHANE-D4	3855-82-1	50-200	93
3	FLUOROBENZENE	462-06-6	50-200	84
# of out-of-control				0

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

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: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: MW-22-3	Lab Sample ID: 03-4572-10	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-10	Prep. No: -	Anal. Time: 20:21
Methanol Vol. -	Sample Amount: 25.0 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	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	2.0	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	0.5	<0.5	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	0.5	<0.5	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	2	J
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)	70-129	96
2	1,2-DICHLOROETHANE-D4	70-129	116
3	DIBROMOFLUOROMETHANE	70-122	112
4	TOLUENE-D8	73-129	101
#	of out-of-control		0

Internal Standard

		Control Limit, %	IS Rec.%
1	CHLOROBENZENE-D5	50-200	93
2	1,4-DICHLOROETHANE-D4	50-200	93
3	FLUOROBENZENE	50-200	84
#	of out-of-control		0

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

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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10/18/07

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 08/11/2003
Project ID: JPL	Service ID: 34572	Collected by:
Sample ID: TB-7-8-11-03	Lab Sample ID: 03-4572-11	Received Date: 08/11/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: A
Batch No: 03G3659	Prep. Date: 08/11/03	Anal. Date: 08/11/03
Data File Name: 4572-11	Prep. No: -	Anal. Time: 20:47
Methanol Vol: -	Sample Amount: 25.0 mL	Dilution Factor: 1
Test Level: Low	Spurge 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 WJ
7	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
10	2-BUTANONE	78-93-3	µg/L	10	<10	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	0.5	<0.5	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

9/10/03
 N 34572

#	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	0.5	0.4	J
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	1,1,2-TRICHLORO-1,1,2,2-TETRACHLOROETHANE	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	97	
2	1,2-DICHLOROETHANE-D4	17060-07-0		70-129	114	
3	DIBROMOFLUOROMETHANE	1868-53-7		70-122	110	
4	TOLUENE-D8	2037-26-5		73-129	96	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	93	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	91	
3	FLUOROBENZENE	462-06-6		50-200	83	
# of out-of-control					0	

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

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

10/18/03

LDC #: 10962C1

VALIDATION COMPLETENESS WORKSHEET

SDG #: 03-4572

Level III

Laboratory: Applied Physics & Chemistry Laboratory

Date: 10/9/03

Page: 1 of 1

Reviewer: *[Signature]*2nd Reviewer: *[Signature]*METHOD: GC/MS Volatiles (EPA SW-846 Method 8260B) ^{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: 8/11/03
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	70RSD. r^2 . NO RRFs
IV.	Continuing calibration	TW	✓
V.	Blanks	A	
VI.	Surrogate spikes	A	
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	TW	D=1+9
XVII.	Field blanks	TW	TB=11. 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

*ND

Validated Samples:

MU H₂O's

1	DUPE-5-3-Q03	11	TB-7-8-11-03	21	0343659 MB01	31	
2	EB-7-8-11-03	12	MW-12-4MS	22		32	
3	MW-12-1	13	MW-12-4MSD	23		33	
4	MW-12-2	14		24		34	
5	MW-12-3	15		25		35	
6	MW-12-4	16		26		36	
7	MW-12-5	17		27		37	
8	MW-22-1	18		28		38	
9	MW-22-2	19		29		39	
10	MW-22-3	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	Q. 1,2-Dichloropropane	GG. Xylenes, total	WW. 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-Dichloroethane	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-Dichloropropane	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:

LDC #: 1096201
SDG #: 03-4572

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: _____
2nd reviewer: _____

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (<u>mg/L</u>)		RPD
	1	9	
<u>Y</u>	<u>0.4</u>	<u>0.6</u>	<u>40</u>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 1096201
SDG #: 03-4572

VALIDATION FINDINGS WORKSHEET

Field Blanks

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

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 11 Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (<u>ug/L</u>)
<u>E</u>	<u>0.4</u>

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()