# APPENDIX D

**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

July 15, 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 July 7, 2003. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 10531:**

| SDG # | Fraction |
|---|---|
| 03-2931, 03-3112, 03-3205, 03-3351, 03-3393 | Volatiles, 1,4-Dioxane, Metals, NDMA, 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

Attachment 1

# LDC #10531 (Geofon, Inc.-Diamond Bar / NASA Jet Propulsion Laboratory, DO#001)

| LDC | SDG# | DATE REC'D | DATE DUE | VOA (524.2) | | 1,4-Dioxane (8270C-SIM) | | (5) Metals (200.7/9) | | Cr, Pb (200.8) | | NDMA | | Alk. (2320B) | | pH (9040B) | | TDS (160.1) | | Cr(VI) (7196) | | CLO4 (314.0) | | Cl (300.0) | | NO3-N (300.0) | | SO4 (300.0) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: | Water/Soil | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 03-2931 | 7/7/03 | 7/28/03 | - | - | - | - | - | - | 42 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | |
| B | 03-3112 | 7/7/03 | 7/28/03 | - | - | - | - | - | - | 47 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | |
| C | 03-3205 | 7/7/03 | 7/28/03 | 8 | 0 | - | - | 10 | 0 | - | - | - | - | 7 | 0 | 8 | 0 | 7 | 0 | 9 | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 | 0 | | | | | | | | |
| D | 03-3351 | 7/7/03 | 7/28/03 | - | - | 6 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | |
| E | 03-3393 | 7/7/03 | 7/28/03 | - | - | - | - | - | - | - | - | 2 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | |
| Total | B | | | 8 | 0 | 6 | 0 | 10 | 0 | 89 | 0 | 2 | 0 | 7 | 0 | 8 | 0 | 7 | 0 | 9 | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Shaded cells indicate Level IV validation (all other cells are Level III validation).

# NASA JPL
# Data Validation Reports
# LDC# 10531

## Volatiles

LDC

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** May 13, 2003

**LDC Report Date:** July 11, 2003

**Matrix:** Water

**Parameters:** Volatiles

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-3205

**Sample Identification**

DUPE-7-2Q03
EB-13-5/13/03
MW-18-1
MW-18-2
MW-18-3
MW-18-4
MW-18-5
TB-13-5/13/03

## Introduction

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

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

## V. Blanks

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

| Method Blank ID | Analysis Date | Compound TIC (RT in minutes) | Concentration | Associated Samples |
|---|---|---|---|---|
| 03G2534-MB-01 | 5/19/03 | Methylene chloride | 4.7 ug/L | All samples in SDG 03-3205 |

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

| Sample | Compound TIC (RT in minutes) | Reported Concentration | Modified Final Concentration |
|---|---|---|---|
| TB-13-5/13/03 | Methylene chloride | 3.9 ug/L | 3.9U ug/L |

## 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

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

## 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-7-2Q03 and MW-18-4 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

| Compound | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | DUPE-7-2Q03 | MW-18-4 | |
| Carbon tetrachloride | 2.4 | 2.4 | 0 |
| Chloroform | 0.8 | 0.9 | 12 |
| 4-Methyl-2-pentanone | 6 | 7 | 15 |
| Tetrachloroethene | 1.9 | 2.1 | 10 |
| Trichloroethene | 0.9 | 1.0 | 11 |

## XVII. Field Blanks

Sample TB-13-5/13/03 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-13-5/13/03 | 4-Methyl-2-pentanone<br>Methylene chloride | 6<br>3.9 |

Sample EB-13-5/13/03 was identified as an equipment blank. No volatile contaminants were found in this blank with the following exceptions:

| Equipment Blank ID | Compound | Concentration (ug/L) |
|---|---|---|
| EB-13-5/13/03 | 4-Methyl-2-pentanone | 4 |

**NASA JPL**
**Volatiles - Data Qualification Summary - SDG 03-3205**

No Sample Data Qualified in this SDG

**NASA JPL**
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 03-3205**

| SDG | Sample | Compound TIC (RT in minutes) | Modified Final Concentration | A or P |
|---|---|---|---|---|
| 03-3205 | TB-13-5/13/03 | Methylene chloride | 3.9U ug/L | A |

c1

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| | | Lab Sample ID: | 03-3205-1 | Received Date: | 05/13/2003 |
| Sample ID: | **DUPE-7-2Q03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Anal. Method: | 524.2 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Batch No: | 03G2534 | Prep. No: | – | Anal. Time: | 00:32 |
| Data File Name: | 3205-01 | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Methanol Vol. | – | | | | |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) N | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | BENZENE | 71-43-2 | µg/L | 0.5 | <0.5 | U |
| 2 | BROMOBENZENE | 108-86-1 | µg/L | 0.5 | <0.5 | U |
| 3 | BROMOCHLOROMETHANE | 74-97-5 | µg/L | 0.5 | <0.5 | U |
| 4 | BROMODICHLOROMETHANE | 75-27-4 | µg/L | 0.5 | <0.5 | U |
| 5 | BROMOFORM | 75-25-2 | µg/L | 0.5 | <0.5 | U |
| 6 | BROMOMETHANE | 74-83-9 | µg/L | 0.5 | <0.5 | U |
| 7 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | U |
| 8 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 9 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 10 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | µg/L | 0.5 | 2.4 | |
| 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 | 0.8 | |
| 16 | CHLOROMETHANE | 74-87-3 | µg/L | 0.5 | <0.5 | U |
| 17 | 2-CHLOROTOLUENE | 95-49-8 | µg/L | 0.5 | <0.5 | U |
| 18 | 4-CHLOROTOLUENE | 106-43-4 | µg/L | 0.5 | <0.5 | U |
| 19 | 1,2-DIBROMO-3-CHLOROPROPANE | 96-12-8 | µg/L | 1.1 [a] | <1.1 | U |
| 20 | 1,2-DIBROMOETHANE (EDB) | 106-93-4 | µg/L | 0.5 | <0.5 | U |
| 21 | DIBROMOMETHANE | 74-95-3 | µg/L | 0.5 | <0.5 | U |
| 22 | 1,2-DICHLOROBENZENE | 95-50-1 | µg/L | 0.5 | <0.5 | U |
| 23 | 1,3-DICHLOROBENZENE | 541-73-1 | µg/L | 0.5 | <0.5 | U |
| 24 | 1,4-DICHLOROBENZENE | 106-46-7 | µg/L | 0.5 | <0.5 | U |
| 25 | DICHLORODIFLUOROMETHANE | 75-71-8 | µg/L | 0.5 | <0.5 | U |
| 26 | 1,1-DICHLOROETHANE | 75-34-3 | µg/L | 0.5 | <0.5 | U |
| 27 | 1,2-DICHLOROETHANE | 107-06-2 | µg/L | 0.5 | <0.5 | U |
| 28 | 1,1-DICHLOROETHENE | 75-35-4 | µg/L | 0.5 | <0.5 | U |
| 29 | CIS-1,2-DICHLOROETHENE | 156-59-2 | µg/L | 0.5 | <0.5 | U |
| 30 | TRANS-1,2-DICHLOROETHENE | 156-60-5 | µg/L | 0.5 | <0.5 | U |
| 31 | 1,2-DICHLOROPROPANE | 78-87-5 | µg/L | 0.5 | <0.5 | U |
| 32 | 1,3-DICHLOROPROPANE | 142-28-9 | µg/L | 0.5 | <0.5 | U |
| 33 | 2,2-DICHLOROPROPANE | 594-20-7 | µg/L | 0.5 | <0.5 | U |
| 34 | 1,1-DICHLOROPROPENE | 563-58-6 | µg/L | 0.5 | <0.5 | U |
| 35 | CIS-1,3-DICHLOROPROPENE | 10061-01-5 | µg/L | 0.5 | <0.5 | U |
| 36 | TRANS-1,3-DICHLOROPROPENE | 10061-02-6 | µg/L | 0.5 | <0.5 | U |
| 37 | ETHYLBENZENE | 100-41-4 | µg/L | 0.5 | <0.5 | U |
| 38 | HEXACHLOROBUTADIENE | 87-68-3 | µg/L | 0.5 | <0.5 | U |
| 39 | ISOPROPYLBENZENE (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |



[illegible] 1/14/03

Continued



| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 40 | P-ISOPROPYLTOLUENE | 99-87-6 | µg/L | 0.5 | <0.5 | U |
| 41 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | 6 | J |
| 42 | METHYLENE CHLORIDE | 75-09-2 | µg/L | 1.8 [a] | <1.8 | U |
| 43 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | 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 | 1.9 | |
| 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 | 0.9 | |
| 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 | 112 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 99 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 107 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 111 |
| # of out-of-control | | | | 0 |

**Internal Standard**

| | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 79 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 88 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 89 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **EB-13-5/13/03** | Lab Sample ID: | 03-3205-2 | Received Date: | 05/13/2003 |
| Sample Type: | Field Sample | Sample Matrix | Water | Moisture %: | – |
| Anal. Method: | 524.2 | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Batch No: | 03G2534 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Data File Name: | 3205-02 | Prep. No: | – | Anal. Time: | 01:02 |
| Methanol Vol. | – | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: | (Y/N) N |

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

Continued



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

**Surrogates**

| | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 102 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 91 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 99 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 105 |
| # of out-of-control | | | | 0 |

**Internal Standard**

| | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 89 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 100 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 100 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

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Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **MW-18-1** | Lab Sample ID: | 03-3205-3 | Received Date: | 05/13/2003 |
| Sample Type: | Field Sample | Sample Matrix | Water | Moisture %: | – |
| Anal. Method: | 524.2 | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Batch No: | 03G2534 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Data File Name: | 3205-03 | Prep. No: | – | Anal. Time: | 01:31 |
| Methanol Vol. | – | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) N | |

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

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Continued



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

**Surrogates**

| | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 82 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 93 |
| 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 | 100 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 108 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 111 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

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Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **MW-18-2** | Lab Sample ID: | 03-3205-4 | Received Date: | 05/13/2003 |
| | | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Anal. Method: | 524.2 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Batch No: | 03G2534 | Prep. No: | – | Anal. Time: | 02:01 |
| Data File Name: | 3205-04 | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Methanol Vol. | – | | | | |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) | N |

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

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Continued



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

**Surrogates**

| | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 100 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 89 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 96 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 100 |
| # of out-of-control | | | | 0 |

**Internal Standard**

| | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 99 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 109 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 112 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | MW-18-3 | Lab Sample ID: | 03-3205-5 | Received Date: | 05/13/2003 |
| | | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Anal. Method: | 524.2 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Batch No: | 03G2534 | Prep. No: | – | Anal. Time: | 02:31 |
| Data File Name: | 3205-05 | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Methanol Vol. | – | | | | |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) N | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | BENZENE | 71-43-2 | µg/L | 0.5 | <0.5 | U |
| 2 | BROMOBENZENE | 108-86-1 | µg/L | 0.5 | <0.5 | U |
| 3 | BROMOCHLOROMETHANE | 74-97-5 | µg/L | 0.5 | <0.5 | U |
| 4 | BROMODICHLOROMETHANE | 75-27-4 | µg/L | 0.5 | <0.5 | U |
| 5 | BROMOFORM | 75-25-2 | µg/L | 0.5 | <0.5 | U |
| 6 | BROMOMETHANE | 74-83-9 | µg/L | 0.5 | <0.5 | U |
| 7 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | U |
| 8 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 9 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 10 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | µg/L | 0.5 | <0.5 | U |
| 12 | CHLOROBENZENE | 108-90-7 | µg/L | 0.5 | <0.5 | U |
| 13 | CHLORODIBROMOMETHANE | 124-48-1 | µg/L | 0.5 | <0.5 | U |
| 14 | CHLOROETHANE | 75-00-3 | µg/L | 0.5 | <0.5 | U |
| 15 | CHLOROFORM | 67-66-3 | µg/L | 0.5 | 1.2 | |
| 16 | CHLOROMETHANE | 74-87-3 | µg/L | 0.5 | <0.5 | U |
| 17 | 2-CHLOROTOLUENE | 95-49-8 | µg/L | 0.5 | <0.5 | U |
| 18 | 4-CHLOROTOLUENE | 106-43-4 | µg/L | 0.5 | <0.5 | U |
| 19 | 1,2-DIBROMO-3-CHLOROPROPANE | 96-12-8 | µg/L | 1.1 [a] | <1.1 | U |
| 20 | 1,2-DIBROMOETHANE (EDB) | 106-93-4 | µg/L | 0.5 | <0.5 | U |
| 21 | DIBROMOMETHANE | 74-95-3 | µg/L | 0.5 | <0.5 | U |
| 22 | 1,2-DICHLOROBENZENE | 95-50-1 | µg/L | 0.5 | <0.5 | U |
| 23 | 1,3-DICHLOROBENZENE | 541-73-1 | µg/L | 0.5 | <0.5 | U |
| 24 | 1,4-DICHLOROBENZENE | 106-46-7 | µg/L | 0.5 | <0.5 | U |
| 25 | DICHLORODIFLUOROMETHANE | 75-71-8 | µg/L | 0.5 | <0.5 | U |
| 26 | 1,1-DICHLOROETHANE | 75-34-3 | µg/L | 0.5 | <0.5 | U |
| 27 | 1,2-DICHLOROETHANE | 107-06-2 | µg/L | 0.5 | <0.5 | U |
| 28 | 1,1-DICHLOROETHENE | 75-35-4 | µg/L | 0.5 | <0.5 | U |
| 29 | CIS-1,2-DICHLOROETHENE | 156-59-2 | µg/L | 0.5 | <0.5 | U |
| 30 | TRANS-1,2-DICHLOROETHENE | 156-60-5 | µg/L | 0.5 | <0.5 | U |
| 31 | 1,2-DICHLOROPROPANE | 78-87-5 | µg/L | 0.5 | <0.5 | U |
| 32 | 1,3-DICHLOROPROPANE | 142-28-9 | µg/L | 0.5 | <0.5 | U |
| 33 | 2,2-DICHLOROPROPANE | 594-20-7 | µg/L | 0.5 | <0.5 | U |
| 34 | 1,1-DICHLOROPROPENE | 563-58-6 | µg/L | 0.5 | <0.5 | U |
| 35 | CIS-1,3-DICHLOROPROPENE | 10061-01-5 | µg/L | 0.5 | <0.5 | U |
| 36 | TRANS-1,3-DICHLOROPROPENE | 10061-02-6 | µg/L | 0.5 | <0.5 | U |
| 37 | ETHYLBENZENE | 100-41-4 | µg/L | 0.5 | <0.5 | U |
| 38 | HEXACHLOROBUTADIENE | 87-68-3 | µg/L | 0.5 | <0.5 | U |
| 39 | ISOPROPYLBENZENE (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

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Continued



| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 40 | P-ISOPROPYLTOLUENE | 99-87-6 | µg/L | 0.5 | <0.5 | U |
| 41 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | 4 | J |
| 42 | METHYLENE CHLORIDE | 75-09-2 | µg/L | 1.8 [a] | <1.8 | U |
| 43 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 44 | NAPHTHALENE | 91-20-3 | µg/L | 0.5 | <0.5 | U |
| 45 | N-PROPYLBENZENE | 103-65-1 | µg/L | 0.5 | <0.5 | U |
| 46 | STYRENE | 100-42-5 | µg/L | 0.5 | <0.5 | U |
| 47 | 1,1,1,2-TETRACHLOROETHANE | 630-20-6 | µg/L | 0.5 | <0.5 | U |
| 48 | 1,1,2,2-TETRACHLOROETHANE | 79-34-5 | µg/L | 0.5 | <0.5 | U |
| 49 | TETRACHLOROETHENE | 127-18-4 | µg/L | 0.5 | <0.5 | U |
| 50 | TOLUENE | 108-88-3 | µg/L | 0.5 | <0.5 | U |
| 51 | 1,2,3-TRICHLOROBENZENE | 87-61-6 | µg/L | 0.5 | <0.5 | U |
| 52 | 1,2,4-TRICHLOROBENZENE | 120-82-1 | µg/L | 0.5 | <0.5 | U |
| 53 | 1,1,1-TRICHLOROETHANE | 71-55-6 | µg/L | 0.5 | <0.5 | U |
| 54 | 1,1,2-TRICHLOROETHANE | 79-00-5 | µg/L | 0.5 | <0.5 | U |
| 55 | TRICHLOROETHENE | 79-01-6 | µg/L | 0.5 | 0.4 | J |
| 56 | TRICHLOROFLUOROMETHANE | 75-69-4 | µg/L | 0.5 | <0.5 | U |
| 57 | 1,2,3-TRICHLOROPROPANE | 96-18-4 | µg/L | 0.5 | <0.5 | U |
| 58 | 112TRICHLORO-122TRIFLUOROETHANE | 76-13-1 | µg/L | 0.5 | <0.5 | U |
| 59 | 1,2,4-TRIMETHYLBENZENE | 95-63-6 | µg/L | 0.5 | <0.5 | U |
| 60 | 1,3,5-TRIMETHYLBENZENE | 108-67-8 | µg/L | 0.5 | <0.5 | U |
| 61 | VINYL CHLORIDE | 75-01-4 | µg/L | 0.5 | <0.5 | U |
| 62 | O-XYLENE | 95-47-6 | µg/L | 0.5 | <0.5 | U |
| 63 | M/P-XYLENE | 108-38-3 | µg/L | 0.5 | <0.5 | U |

**Surrogates**

| | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 103 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 95 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 100 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 106 |
| # of out-of-control | | | | 0 |

**Internal Standard**

| | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 99 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 109 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 109 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

7/19/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **MW-18-4** | Lab Sample ID: | 03-3205-6 | Received Date: | 05/13/2003 |
| Sample Type: | Field Sample | Sample Matrix | Water | Moisture %: | – |
| Anal. Method: | 524.2 | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Batch No: | 03G2534 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Data File Name: | 3205-06 | Prep. No: | – | Anal. Time: | 03:00 |
| Methanol Vol. | – | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: | (Y/N) N |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | BENZENE | 71-43-2 | µg/L | 0.5 | <0.5 | U |
| 2 | BROMOBENZENE | 108-86-1 | µg/L | 0.5 | <0.5 | U |
| 3 | BROMOCHLOROMETHANE | 74-97-5 | µg/L | 0.5 | <0.5 | U |
| 4 | BROMODICHLOROMETHANE | 75-27-4 | µg/L | 0.5 | <0.5 | U |
| 5 | BROMOFORM | 75-25-2 | µg/L | 0.5 | <0.5 | U |
| 6 | BROMOMETHANE | 74-83-9 | µg/L | 0.5 | <0.5 | U |
| 7 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | U |
| 8 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 9 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 10 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | µg/L | 0.5 | 2.4 | |
| 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 | 0.9 | |
| 16 | CHLOROMETHANE | 74-87-3 | µg/L | 0.5 | <0.5 | U |
| 17 | 2-CHLOROTOLUENE | 95-49-8 | µg/L | 0.5 | <0.5 | U |
| 18 | 4-CHLOROTOLUENE | 106-43-4 | µg/L | 0.5 | <0.5 | U |
| 19 | 1,2-DIBROMO-3-CHLOROPROPANE | 96-12-8 | µg/L | 1.1 (a) | <1.1 | U |
| 20 | 1,2-DIBROMOETHANE (EDB) | 106-93-4 | µg/L | 0.5 | <0.5 | U |
| 21 | DIBROMOMETHANE | 74-95-3 | µg/L | 0.5 | <0.5 | U |
| 22 | 1,2-DICHLOROBENZENE | 95-50-1 | µg/L | 0.5 | <0.5 | U |
| 23 | 1,3-DICHLOROBENZENE | 541-73-1 | µg/L | 0.5 | <0.5 | U |
| 24 | 1,4-DICHLOROBENZENE | 106-46-7 | µg/L | 0.5 | <0.5 | U |
| 25 | DICHLORODIFLUOROMETHANE | 75-71-8 | µg/L | 0.5 | <0.5 | U |
| 26 | 1,1-DICHLOROETHANE | 75-34-3 | µg/L | 0.5 | <0.5 | U |
| 27 | 1,2-DICHLOROETHANE | 107-06-2 | µg/L | 0.5 | <0.5 | U |
| 28 | 1,1-DICHLOROETHENE | 75-35-4 | µg/L | 0.5 | <0.5 | U |
| 29 | CIS-1,2-DICHLOROETHENE | 156-59-2 | µg/L | 0.5 | <0.5 | U |
| 30 | TRANS-1,2-DICHLOROETHENE | 156-60-5 | µg/L | 0.5 | <0.5 | U |
| 31 | 1,2-DICHLOROPROPANE | 78-87-5 | µg/L | 0.5 | <0.5 | U |
| 32 | 1,3-DICHLOROPROPANE | 142-28-9 | µg/L | 0.5 | <0.5 | U |
| 33 | 2,2-DICHLOROPROPANE | 594-20-7 | µg/L | 0.5 | <0.5 | U |
| 34 | 1,1-DICHLOROPROPENE | 563-58-6 | µg/L | 0.5 | <0.5 | U |
| 35 | CIS-1,3-DICHLOROPROPENE | 10061-01-5 | µg/L | 0.5 | <0.5 | U |
| 36 | TRANS-1,3-DICHLOROPROPENE | 10061-02-6 | µg/L | 0.5 | <0.5 | U |
| 37 | ETHYLBENZENE | 100-41-4 | µg/L | 0.5 | <0.5 | U |
| 38 | HEXACHLOROBUTADIENE | 87-68-3 | µg/L | 0.5 | <0.5 | U |
| 39 | ISOPROPYLBENZENE (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

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Continued



| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 40 | P-ISOPROPYLTOLUENE | 99-87-6 | µg/L | 0.5 | <0.5 | U |
| 41 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | 7 | J |
| 42 | METHYLENE CHLORIDE | 75-09-2 | µg/L | 1.8 [a] | <1.8 | U |
| 43 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | 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 | 2.1 | |
| 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 | 1.0 | |
| 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 | 99 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 94 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 102 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 107 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 94 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 108 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 103 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **MW-18-5** | Lab Sample ID: | 03-3205-7 | Received Date: | 05/13/2003 |
| Sample Type: | Field Sample | Sample Matrix | Water | Moisture %: | – |
| Anal. Method: | 524.2 | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Batch No: | 03G2534 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Data File Name: | 3205-07 | Prep. No: | – | Anal. Time: | 03:29 |
| Methanol Vol. | – | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) | N |

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

Continued



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

| Surrogates | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 108 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 101 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 109 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 113 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 92 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 101 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 100 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/13/2003 |
| Project ID: | JPL GW Mon-2Q03 | Service ID: | 33205 | Collected by: | |
| Sample ID: | **TB-13-5/13/03** | Lab Sample ID: | 03-3205-8 | Received Date: | 05/13/2003 |
| | | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: G |
| Anal. Method: | 524.2 | Prep. Date: | 05/20/03 | Anal. Date: | 05/20/03 |
| Batch No: | 03G2534 | Prep. No: | – | Anal. Time: | 03:59 |
| Data File Name: | 3205-08 | Sample Amount: | 25 mL | Dilution Factor: | 1 |
| Methanol Vol. | – | | | | |
| Test Level: | Low | Sparge Size: | 25 mL | Heated Purge: (Y/N) N | |

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

7/14/03

Continued



| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 40 | P-ISOPROPYLTOLUENE | 99-87-6 | µg/L | 0.5 | <0.5 | U |
| 41 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | 6 | J |
| 42 | METHYLENE CHLORIDE | 75-09-2 | µg/L | 1.8 [a] | 3.9 U | B |
| 43 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 44 | NAPHTHALENE | 91-20-3 | µg/L | 0.5 | <0.5 | U |
| 45 | N-PROPYLBENZENE | 103-65-1 | µg/L | 0.5 | <0.5 | U |
| 46 | STYRENE | 100-42-5 | µg/L | 0.5 | <0.5 | U |
| 47 | 1,1,1,2-TETRACHLOROETHANE | 630-20-6 | µg/L | 0.5 | <0.5 | U |
| 48 | 1,1,2,2-TETRACHLOROETHANE | 79-34-5 | µg/L | 0.5 | <0.5 | U |
| 49 | TETRACHLOROETHENE | 127-18-4 | µg/L | 0.5 | <0.5 | U |
| 50 | TOLUENE | 108-88-3 | µg/L | 0.5 | <0.5 | U |
| 51 | 1,2,3-TRICHLOROBENZENE | 87-61-6 | µg/L | 0.5 | <0.5 | U |
| 52 | 1,2,4-TRICHLOROBENZENE | 120-82-1 | µg/L | 0.5 | <0.5 | U |
| 53 | 1,1,1-TRICHLOROETHANE | 71-55-6 | µg/L | 0.5 | <0.5 | U |
| 54 | 1,1,2-TRICHLOROETHANE | 79-00-5 | µg/L | 0.5 | <0.5 | U |
| 55 | TRICHLOROETHENE | 79-01-6 | µg/L | 0.5 | <0.5 | U |
| 56 | TRICHLOROFLUOROMETHANE | 75-69-4 | µg/L | 0.5 | <0.5 | U |
| 57 | 1,2,3-TRICHLOROPROPANE | 96-18-4 | µg/L | 0.5 | <0.5 | U |
| 58 | 112TRICHLORO-122TRIFLUOROETHANE | 76-13-1 | µg/L | 0.5 | <0.5 | U |
| 59 | 1,2,4-TRIMETHYLBENZENE | 95-63-6 | µg/L | 0.5 | <0.5 | U |
| 60 | 1,3,5-TRIMETHYLBENZENE | 108-67-8 | µg/L | 0.5 | <0.5 | U |
| 61 | VINYL CHLORIDE | 75-01-4 | µg/L | 0.5 | <0.5 | U |
| 62 | O-XYLENE | 95-47-6 | µg/L | 0.5 | <0.5 | U |
| 63 | M/P-XYLENE | 108-38-3 | µg/L | 0.5 | <0.5 | U |

**Surrogates**

| | | | Control Limit, % | Surro. Rec.% |
|---|---|---|---|---|
| 1 | 1-BROMO-4-FLUOROBENZENE (4-BROMOFL | 460-00-4 | 70-129 | 105 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 91 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 99 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 106 |
| # of out-of-control | | | | 0 |

**Internal Standard**

| | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 96 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 106 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 110 |
| # of out-of-control | | | | 0 |

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

[a] MDL reported.

Qualifier: U - Not Detected or less than MDL
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)
E - Exceed calibration range
B - A positive value was found in the method blank
D - Diluted

7/14/03

LDC #: 10531C1

SDG #: 03-3205

Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 7/9/03

Page: 1 of 1

Reviewer: KZ

2nd Reviewer:

**METHOD:** GC/MS Volatiles (EPA Method 524.2)

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

| | Validation Area | | Comments |
|---|---|---|---|
| I. | Technical holding times | A | Sampling dates: 5/13/03 |
| II. | GC/MS Instrument performance check | | |
| III. | Initial calibration | A | % RSD ≤ 20%, $r^2$ ≥ 0.990 |
| IV. | Continuing calibration | A | % D ≤ 30% |
| V. | Blanks | SW | |
| VI. | Surrogate spikes | A | |
| VII. | Matrix spike/Matrix spike duplicates | N | client specified |
| VIII. | Laboratory control samples | A | LCS |
| IX. | Regional Quality Assurance and Quality Control | N | |
| X. | Internal standards | A | |
| XI. | Target compound identification | N | |
| XII. | Compound quantitation/CRQLs | N | |
| XIII. | Tentatively identified compounds (TICs) | N | |
| XIV. | System performance | N | |
| XV. | Overall assessment of data | A | |
| XVI. | Field duplicates | SW | 1 & 6 |
| XVII. | Field blanks | SW | EB = 2 TB = 8 |

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:

water

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 + | DUPE-7-2Q03 D | 11 | | 21 | | 31 | |
| 2 + | EB-13-5/13/03 | 12 | | 22 | | 32 | |
| 3 + | MW-18-1 | 13 | | 23 | | 33 | |
| 4 + | MW-18-2 | 14 | | 24 | | 34 | |
| 5 + | MW-18-3 | 15 | | 25 | | 35 | |
| 6 + | MW-18-4 D | 16 | | 26 | | 36 | |
| 7 + | MW-18-5 | 17 | | 27 | | 37 | |
| 8 + | TB-13-5/13/03 | 18 | | 28 | | 38 | |
| 9 + | 03G2534-MB-01 | 19 | | 29 | | 39 | |
| 10 | | 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 choride | S. Trichloroethene | II. 2-Chloroethylvinyl ether | YY. n-Propylbenzene | OOO. 1,3,5-Trichlorobenzene |
| D. Chloroethane | T. Dibromochloromethane | JJ. Dichlorodifluoromethane | ZZ. 2-Chlorotoluene | PPP. trans-1,2-Dichloroethene |
| E. Methylene chloride | U. 1,1,2-Trichloroethane | KK. Trichlorofluoromethane | AAA. 1,3,5-Trimethylbenzene | QQQ. cis-1,2-Dichloroethene |
| F. Acetone | V. Benzene | LL. Methyl-tert-butyl ether | BBB. 4-Chlorotoluene | RRR. m,p-Xylenes |
| G. Carbon disulfide | W. trans-1,3-Dichloropropene | MM. 1,2-Dibromo-3-chloropropane | CCC. tert-Butylbenzene | SSS. o-Xylene |
| H. 1,1-Dichloroethene | X. Bromoform | NN. Diethyl ether | DDD. 1,2,4-Trimethylbenzene | TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane |
| I. 1,1-Dichloroethane | Y. 4-Methyl-2-pentanone | OO. 2,2-Dichloropropane | EEE. sec-Butylbenzene | UUU. Benzyl chloride |
| J. 1,2-Dichloroethene, total | Z. 2-Hexanone | PP. Bromochloromethane | FFF. 1,3-Dichlorobenzene | VVV. 4-Ethyltoluene |
| K. Chloroform | AA. Tetrachloroethene | QQ. 1,1-Dichloropropene | GGG. p-Isopropyltoluene | WWW. Ethanol |
| L. 1,2-Dichloroethane | BB. 1,1,2,2-Tetrachloroethane | RR. Dibromomethane | HHH. 1,4-Dichlorobenzene | XXX. Ethyl ether |
| M. 2-Butanone | CC. Toluene | SS. 1,3-Dichloropropane | III. n-Butylbenzene | |
| N. 1,1,1-Trichloroethane | DD. Chlorobenzene | TT. 1,2-Dibromoethane | JJJ. 1,2-Dichlorobenzene | |
| O. Carbon tetrachloride | EE. Ethylbenzene | UU. 1,1,1,2-Tetrachloroethane | KKK. 1,2,4-Trichlorobenzene | |
| P. Bromodichloromethane | FF. Styrene | VV. Isopropylbenzene | LLL. Hexachlorobutadiene | |

Notes:

LDC #: 10531C1
SDG #: 03-3205

# VALIDATION FINDINGS WORKSHEET
## Blanks

Page: 1 of 1
Reviewer: EZ
2nd Reviewer:

**METHOD:** GC/MS VOA (EPA Method 524.2)

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

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

**Blank analysis date:** 5/19/03
**Conc. units:** ug/L
Associated Samples: all

| Compound | Blank ID | Sample Identification | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0392534-MB-01 | 8 | | | | | | | | |
| Methylene chloride | 4.7 | | 3.9/U | | | | | | | |
| ~~Acetone~~ | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| CRQL | | | | | | | | | | |

**Blank analysis date:**
**Conc. units:**
Associated Samples:

| Compound | Blank ID | Sample Identification | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Methylene chloride | | | | | | | | | | |
| Acetone | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| CRQL | | | | | | | | | | |

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 10531C1
SDG #: 03 - 3205

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates

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

**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 ( ug/L ) | | RPD |
|---|---|---|---|
| | 1 | 6 | |
| O | 2.4 | 2.4 | 0 |
| K | 0.8 | 0.9 | 12 |
| Y | 6 | 7 | 15 |
| AA | 1.9 | 2.1 | 10 |
| S | 0.9 | 1.0 | 11 |
| | | | |
| | | | |

| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

LDC #: 105310 1
SDG #: 03-3205

# VALIDATION FINDINGS WORKSHEET
## Field Blanks

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

METHOD: GC/MS VOA (EPA ~~SW 846 Method 8260B~~ 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: 2 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

| Compound | Concentration Units (ug/L) |
|---|---|
| Y | 4 |
| | |
| | |
| | |
| | |
| | |

Sample: 8 Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

| Compound | Concentration Units (ug/L) |
|---|---|
| Y | 6 |
| E | 3.9 |
| | |
| | |
| | |
| | |

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

| Compound | Concentration Units ( ) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

# NASA JPL
# Data Validation Reports
# LDC# 10531

## 1,4-Dioxane

LDC

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** May 22, 2003

**LDC Report Date:** July 11, 2003

**Matrix:** Water

**Parameters:** 1,4-Dioxane

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-3351

**Sample Identification**

DUPE-8-2Q03
EB-14-5/22/03
MW-4-2
MW-4-3
MW-4-4
MW-4-5

## Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for 1,4-Dioxane.

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 30.0% for all compounds.

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 25.0% for all compounds.

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No 1,4-Dioxane 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

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

## VIII. Laboratory Control Samples (LCS)

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

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

## XVI. Field Duplicates

Samples DUPE-8-2Q03 and MW-4-2 were identified as field duplicates. No 1,4-Dioxane was detected in any of the samples with the following exceptions:

| Compound | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | DUPE-8-2Q03 | MW-4-2 | |
| 1,4-Dioxane | 1 | 1 | 0 |

## XVII. Field Blanks

Sample EB-14-5/22/03 was identified as an equipment blank. No 1,4-Dioxane was found in this blank.

**NASA JPL**
**1,4-Dioxane - Data Qualification Summary - SDG 03-3351**

No Sample Data Qualified in this SDG

**NASA JPL**
**1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG 03-3351**

No Sample Data Qualified in this SDG

/

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-1 | Received Date: | 05/22/2003 |
| Sample ID: | **DUPE-8-2Q03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 21:45 |
| Data File Name: | 3351-01 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | $\mu$g/L | 1 | 1 | |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | 50-200 | 95 |
| # of out-of-control | | | | 0 |

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

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-2 | Received Date: | 05/22/2003 |
| Sample ID: | **EB-14-5/22/03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 22:05 |
| Data File Name: | 3351-02 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | $\mu$g/L | 1 | <1 | U |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | 50-200 | 93 |
| # 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

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-3 | Received Date: | 05/22/2003 |
| Sample ID: | MW-4-2 | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 22:26 |
| Data File Name: | 3351-03 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | $\mu$g/L | 1 | 1 | |
| Internal Standard | | | | Control Limit, % | IS Rec.% | |
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | | 50-200 | 93 | |
| # of out-of-control | | | | | 0 | |

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

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-4 | Received Date: | 05/22/2003 |
| Sample ID: | MW-4-3 | Sample Matrix | Water | Moisture %: | - |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 22:47 |
| Data File Name: | 3351-04 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | $\mu g/L$ | 1 | 0.4 | J |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | 50-200 | 85 |
| # of out-of-control | | | | 0 |

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

7/14/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-5 | Received Date: | 05/22/2003 |
| Sample ID: | MW-4-4 | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 23:08 |
| Data File Name: | 3351-05 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | $\mu g/L$ | 1 | <1 | U |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | 50-200 | 96 |
| # 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

7/19/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 8270-SIM

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 05/22/2003 |
| Project ID: | JPL GW-Mon. 2Q03. | Service ID: | 33351 | Collected by: | |
| | | Lab Sample ID: | 03-3351-6 | Received Date: | 05/22/2003 |
| Sample ID: | MW-4-5 | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 3520 | Instrument ID: | GC/MS: M |
| Anal. Method: | 8270-SIM | Prep. Date: | 05/22/03 | Anal. Date: | 05/23/03 |
| Batch No: | 03G2623 | Prep. No: | 1 of 1 | Anal. Time: | 23:29 |
| Data File Name: | 3351-06 | Sample Amount: | 1000 mL | Dilution Factor: | 1 |
| Extract Vol. | 1.0 mL | | | | |

| # | Component Name | CAS No | Unit | RL | Result | Qualifier |
|---|---|---|---|---|---|---|
| 1 | 1,4-DIOXANE | 123-91-1 | μg/L | 1 | <1 | U |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | 1,4-DIOXANE-D8 | 17647-74-4 | 50-200 | 99 |
| # 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

7/14/03

LDC #: 10531D2 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/10/03

SDG #: 03-3351 Level III Page: 1 of 1

Laboratory: Applied P & Ch Laboratory Reviewer: [illegible]

2nd Reviewer: [illegible]

**METHOD:** GC/MS 1,4-Dioxane (EPA SW 846 Method 8270C-SIM)

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: 5/22/03 |
| II. | GC/MS Instrument performance check | A | |
| III. | Initial calibration | A | non-ccc/spcc %RSD ≤ 30 |
| IV. | Continuing calibration | A | ↓ %D ≤ 25 |
| V. | Blanks | A | |
| VI. | Surrogate spikes | A | |
| VII. | Matrix spike/Matrix spike duplicates | N | client specified |
| VIII. | Laboratory control samples | A | LCS/D |
| IX. | Regional Quality Assurance and Quality Control | N | |
| X. | Internal standards | A | |
| XI. | Target compound identification | N | |
| XII. | Compound quantitation/CRQLs | N | |
| XIII. | Tentatively identified compounds (TICs) | N | |
| XIV. | System performance | N | |
| XV. | Overall assessment of data | A | |
| XVI. | Field duplicates | SW | D = 1, 3 |
| XVII. | 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: water

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | DUPE-8-2Q03 D | 11 | | 21 | | 31 | |
| 2 | EB-14-5/22/03 | 12 | | 22 | | 32 | |
| 3 | MW-4-2 D | 13 | | 23 | | 33 | |
| 4 | MW-4-3 | 14 | | 24 | | 34 | |
| 5 | MW-4-4 | 15 | | 25 | | 35 | |
| 6 | MW-4-5 | 16 | | 26 | | 36 | |
| 7 | 03G2623-MB-01 | 17 | | 27 | | 37 | |
| 8 | | 18 | | 28 | | 38 | |
| 9 | | 19 | | 29 | | 39 | |
| 10 | | 20 | | 30 | | 40 | |

LDC #: 10531D2
SDG #: 03-3351

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates

Page: 1 of 1
Reviewer: FZ
2nd reviewer: [illegible]

**METHOD:** GC/MS BNA (EPA SW 846 Method 8270C-SIM)

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

| Compound | Concentration ( ug/L ) | | RPD |
|---|---|---|---|
| | 1 | 3 | |
| 1,4-Dioxane | 1 | 1 | 0 |
| | | | |
| | | | |
| | | | |
| | | | |

| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# NASA JPL
# Data Validation Reports
# LDC# 10531

## Metals

LDC

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** April 17 through April 24,2003

**LDC Report Date:** July 11, 2003

**Matrix:** Water

**Parameters:** Chromium & Lead

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory/Advanced Technology Laboratories

**Sample Delivery Group (SDG):** 03-2931/062725

**Sample Identification**

| | | |
|---|---|---|
| MW-4-5 | Dupe-2-2Q03 | Dupe-2-2Q03DUP |
| MW-4-4 | MW-20-5 | EB-1-4/17/03 |
| MW-4-3 | MW-20-4 | |
| MW-4-2 | MW-20-3 | |
| MW-4-1 | MW-20-2 | |
| EB-2-4/21/03 | MW-20-1 | |
| Dupe-1-2Q03 | EB-5-4/24/03 | |
| Source-2Q03 | Dupe-3-2Q03 | |
| MW-19-5 | MW-21-5 | |
| MW-19-4 | MW-21-4 | |
| MW-19-3 | MW-21-3 | |
| MW-19-2 | MW-21-2 | |
| MW-19-1 | MW-21-1 | |
| EB-3-4/22/03 | EB-1-4/17/03 | |
| MW-14-5 | MW-4-2MS | |
| MW-14-4 | MW-4-2MSD | |
| MW-14-3 | MW-4-2DUP | |
| MW-14-2 | MW-19-2MS | |
| MW-14-1 | MW-19-2MSD | |
| EB-4-4/23/03 | MW-19-2DUP | |

## Introduction

This data review covers 42 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 200.8 for Chromium & Lead.

This 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 flags 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 specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

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

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

| Method Blank ID | Analyte | Maximum Concentration | Associated Samples |
|---|---|---|---|
| PB1 (prep blank) | Chromium | 0.115 ug/L | MW-4-5<br>MW-4-4<br>MW-4-3<br>MW-4-2<br>MW-4-1<br>EB-2-4/21/03<br>Dupe-1-2Q03<br>Source-2Q03<br>MW-19-5<br>MW-19-4<br>MW-19-3<br>MW-19-1<br>EB-3-4/22/03<br>MW-14-5<br>MW-14-4<br>MW-14-3<br>MW-14-2<br>MW-14-1<br>EB-4-4/23/03<br>Dupe-2-2Q03 |

| Method Blank ID | Analyte | Maximum Concentration | Associated Samples |
|---|---|---|---|
| PB2 (prep blank) | Chromium | 0.209 ug/L | MW-19-2<br>MW-20-5<br>MW-20-4<br>MW-20-3<br>MW-20-2<br>MW-20-1<br>EB-5-4/24/03<br>Dupe-3-2Q03<br>MW-21-5<br>MW-21-4<br>MW-21-3<br>MW-21-2<br>MW-21-1<br>EB-1-4/17/03 |
| ICB/CCB1 | Chromium | 0.291 ug/L | All samples in SDG 03-2931/062725 |

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater ( >5X blank contaminants) than the concentrations found in the associated method blanks.

## IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check was not required by the method.

## V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

| Spike ID (Associated Samples) | Analyte | MS (%R) (Limits) | MSD (%R) (Limits) | RPD (Limits) | Flag | A or P |
|---|---|---|---|---|---|---|
| MW-4-2MS/MSD<br>(MW-4-5<br>MW-4-4<br>MW-4-3<br>MW-4-2<br>MW-4-1<br>EB-2-4/21/03<br>Dupe-1-2Q03<br>Source-2Q03<br>MW-19-5<br>MW-19-4<br>MW-19-3<br>MW-19-1<br>EB-3-4/22/03<br>MW-14-5<br>MW-14-4<br>MW-14-3<br>MW-14-2<br>MW-14-1<br>EB-4-4/23/03<br>Dupe-2-2Q03) | Chromium | 75.8 (80-120) | 73.6 (80-120) | - | J (all detects)<br>UJ (all non-detects) | A |
| MW-19-2MS/MSD<br>(MW-19-2<br>MW-20-5<br>MW-20-4<br>MW-20-3<br>MW-20-2<br>MW-20-1<br>EB-5-4/24/03<br>Dupe-3-2Q03<br>MW-21-5<br>MW-21-4<br>MW-21-3<br>MW-21-2<br>MW-21-1<br>EB-1-4/17/03) | Chromium | 75.4 (80-120) | 75.1 (80-120) | - | J (all detects)<br>UJ (all non-detects) | A |

## VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## VII. Laboratory Control Samples (LCS)

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

## VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

## IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## X. ICP Serial Dilution

ICP serial dilution was not required by the method.

## XI. Sample Result Verification

Raw data were not reviewed for this SDG.

## XII. Overall Assessment of Data

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

## XIII. Field Duplicates

Samples MW-4-4 and Dupe-1-2Q03, samples MW-14-3 and Dupe-2-2Q03, and samples MW-20-1 and Dupe-3-2Q03 were identified as field duplicates. No chromium or lead was detected in any of the samples with the following exceptions:

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-4-4 | Dupe-1-2Q03 | |
| Chromium | 3.5 | 2.8 | 22 |

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-14-3 | Dupe-2-2Q03 | |
| Chromium | 3.2 | 2.6 | 21 |

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-20-1 | Dupe-3-2Q03 | |
| Chromium | 2.4 | 2.1 | 13 |

## XIV. Field Blanks

Samples EB-2-4/21/03, EB-3-4/22/03, EB-4-4/23/03, EB-5-4/24/03 and EB-1-4/17/03 were identified as equipment blanks. No chromium or lead contaminants were found in these blanks.

Sample Source-2Q03 was identified as a source blank. No chromium or lead contaminants were found in this blank.

## NASA JPL
## Chromium & Lead - Data Qualification Summary - SDG 03-2931/062725

| SDG | Sample | Analyte | Flag | A or P | Reason |
|---|---|---|---|---|---|
| 03-2931/062725 | MW-4-5<br>MW-4-4<br>MW-4-3<br>MW-4-2<br>MW-4-1<br>EB-2-4/21/03<br>Dupe-1-2Q03<br>Source-2Q03<br>MW-19-5<br>MW-19-4<br>MW-19-3<br>MW-19-1<br>EB-3-4/22/03<br>MW-14-5<br>MW-14-4<br>MW-14-3<br>MW-14-2<br>MW-14-1<br>EB-4-4/23/03<br>Dupe-2-2Q03<br>MW-19-2<br>MW-20-5<br>MW-20-4<br>MW-20-3<br>MW-20-2<br>MW-20-1<br>EB-5-4/24/03<br>Dupe-3-2Q03<br>MW-21-5<br>MW-21-4<br>MW-21-3<br>MW-21-2<br>MW-21-1<br>EB-1-4/17/03 | Chromium | J (all detects)<br>UJ (all non-detects) | A | Matrix spike/Matrix spike duplicates (%R) |

## NASA JPL
## Chromium & Lead - Laboratory Blank Data Qualification Summary - SDG 03-2931/062725

No Sample Data Qualified in this SDG

A4

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-001
**Collection Date:** 4/21/2003 8:10:00 AM
**Client Sample ID:** MW-4-5
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 3.0 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-002
**Collection Date:** 4/21/2003 9:30:00 AM
**Client Sample ID:** MW-4-4
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 3.5 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-003
**Collection Date:** 4/21/2003 10:15:00 AM
**Client Sample ID:** MW-4-3
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 3.8 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

5/16/03

015

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-004
**Client Sample ID:** MW-4-2
**Collection Date:** 4/21/2003 11:40:00 AM
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 6.4 | J | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-005
**Client Sample ID:** MW-4-1
**Collection Date:** 4/21/2003 1:30:00 PM
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 3.4 | J | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-006
**Client Sample ID:** EB-2-4/21/03
**Collection Date:** 4/21/2003
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | ND | UJ | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

5/19/03

016

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-007
**Client Sample ID:** Dupe-1-2Q03
**Collection Date:** 4/21/2003
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.8 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-008
**Client Sample ID:** Source-2Q03
**Collection Date:** 4/21/2003 2:05:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | ND UJ | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-009
**Client Sample ID:** MW-19-5
**Collection Date:** 4/22/2003 9:20:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.5 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03

A17

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-010
**Client Sample ID:** MW-19-4
**Collection Date:** 4/22/2003 10:25:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.4 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-011
**Client Sample ID:** MW-19-3
**Collection Date:** 4/22/2003 11:30:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 5.0 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-012
**Client Sample ID:** MW-19-2
**Collection Date:** 4/22/2003 1:00:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 4.2 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-013
**Client Sample ID:** MW-19-1
**Collection Date:** 4/22/2003 2:10:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.7 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-014
**Client Sample ID:** EB-3-4/22/03
**Collection Date:** 4/22/2003 11:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | UJ | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-015
**Client Sample ID:** MW-14-5
**Collection Date:** 4/23/2003 8:35:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.1 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-016
**Client Sample ID:** MW-14-4
**Collection Date:** 4/23/2003 9:35:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.8 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-017
**Client Sample ID:** MW-14-3
**Collection Date:** 4/23/2003 11:10:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.2 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-018
**Client Sample ID:** MW-14-2
**Collection Date:** 4/23/2003 12:20:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512A | QC Batch: R27306 | | | PrepDate: | | Analyst: NS |
| Chromium | 4.4 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceeding holding time

Results are wet unless othewise specified

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020

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-019
**Client Sample ID:** MW-14-1
**Collection Date:** 4/23/2003 1:20:00 PM
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: **NS**

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 4.6 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-020
**Client Sample ID:** EB-4-4/23/03
**Collection Date:** 4/23/2003 11:25:00 AM
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: **NS**

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | ND UJ | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-021
**Client Sample ID:** Dupe-2-2Q03
**Collection Date:** 4/23/2003
**Matrix:** WATER

**ICP-MS METALS** — **EPA 200.8**

RunID: ICP4_030512A | QC Batch: R27306 | PrepDate: | Analyst: **NS**

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 2.6 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

- ND - Not Detected at the Reporting Limit
- J - Analyte detected below quantitation limits
- B - Analyte detected in the associated Method Blank
- * - Value exceeds Maximum Contaminant Level
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range
- H-Sample exceding holding time

Results are wet unless othewise specified

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# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-022
**Client Sample ID:** MW-20-5
**Collection Date:** 4/24/2003 8:05:00 AM
**Matrix:** WATER

**ICP-MS METALS**

**EPA 200.8**

RunID: ICP4_030512B QC Batch: R27309 PrepDate: Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 1.7 | J | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-023
**Client Sample ID:** MW-20-4
**Collection Date:** 4/24/2003 8:50:00 AM
**Matrix:** WATER

**ICP-MS METALS**

**EPA 200.8**

RunID: ICP4_030512B QC Batch: R27309 PrepDate: Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 2.2 | J | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-024
**Client Sample ID:** MW-20-3
**Collection Date:** 4/24/2003 10:00:00 AM
**Matrix:** WATER

**ICP-MS METALS**

**EPA 200.8**

RunID: ICP4_030512B QC Batch: R27309 PrepDate: Analyst: NS

| Analyte | Result | Qual | PQL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Chromium | 4.2 | J | 1.0 | µg/L | 1 | 5/12/2003 |
| Lead | ND | | 1.0 | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03

022

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-025
**Client Sample ID:** MW-20-2
**Collection Date:** 4/24/2003 10:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.1 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-026
**Client Sample ID:** MW-20-1
**Collection Date:** 4/24/2003 11:45:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.4 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-027
**Client Sample ID:** EB-5-4/24/03
**Collection Date:** 4/24/2003 9:05:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | ND UJ | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-028
**Client Sample ID:** Dupe-3-2Q03
**Collection Date:** 4/24/2003
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.1 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-029
**Client Sample ID:** MW-21-5
**Collection Date:** 4/17/2003 9:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.7 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-030
**Client Sample ID:** MW-21-4
**Collection Date:** 4/17/2003 10:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.8 | 1.0 | J | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/19/03

024

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL
**Lab Order:** 062725

**Lab ID:** 062725-031
**Client Sample ID:** MW-21-3
**Collection Date:** 4/17/2003 11:10:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.7 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-032
**Client Sample ID:** MW-21-2
**Collection Date:** 4/17/2003 12:05:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 4.8 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Lab ID:** 062725-033
**Client Sample ID:** MW-21-1
**Collection Date:** 4/17/2003 12:50:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.5 J | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

5/14/03



*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *16-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #2931, JPL

**Lab Order:** 062725

**Lab ID:** 062725-034
**Client Sample ID:** EB-1-4/17/03

**Collection Date:** 4/17/2003 12:15:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030512B | QC Batch: R27309 | | | PrepDate: | | Analyst: NS |
| Chromium | ND UJ | 1.0 | | µg/L | 1 | 5/12/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/12/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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026

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

LDC #: 10531A4 7 **VALIDATION COMPLETENESS WORKSHEET** Date: 7-9-03

only SDG #: 03-2931/062425 Level III Page: 1 of 1

Laboratory: Applied P & Ch Laboratory/Advanced Technology Laboratories Reviewer: MG

2nd Reviewer: HH

**METHOD:** Chromium & Lead (EPA Method 200.8)

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: 4-17-03 through 4-24-03 |
| II. | Calibration | A | |
| III. | Blanks | SW | |
| IV. | ICP Interference Check Sample (ICS) Analysis | N | Not required |
| V. | Matrix Spike Analysis | SW | |
| VI. | Duplicate Sample Analysis | A | |
| VII. | Laboratory Control Samples (LCS) | A | LCS |
| VIII. | Internal Standard (ICP-MS) | N | Not reviewed |
| IX. | Furnace Atomic Absorption QC | N | Not utilized |
| X. | ICP Serial Dilution | N | Not required |
| XI. | Sample Result Verification | N | |
| XII. | Overall Assessment of Data | A | |
| XIII. | Field Duplicates | SW | D= 2+7, D=17+21, D=26+28 |
| XIV. | Field Blanks | ND | EB= 6, 14, 20, 27, 34 SB= 8 |

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 | 1 | MW-4-5 | W | 11 | 1 | MW-19-3 | W | 21 | 1 | Dupe-2-2Q03 | W | 31 | 2 | MW-21-3 | W | 41 | 1 | Dupe-2-2Q03DUP | W |
| 2 | 1 | MW-4-4 | | 12 | 2 | MW-19-2 | | 22 | 2 | MW-20-5 | | 32 | 2 | MW-21-2 | | 42 | 2 | EB-1-4/17/03DUP | |
| 3 | 1 | MW-4-3 | | 13 | 1 | MW-19-1 | | 23 | 2 | MW-20-4 | | 33 | 2 | MW-21-1 | | 43 | 1 | PBW1 | |
| 4 | 1 | MW-4-2 | | 14 | 1 | EB-3-4/22/03 | | 24 | 2 | MW-20-3 | | 34 | 2 | EB-1-4/17/03 | | 44 | 2 | PBW2 | |
| 5 | 1 | MW-4-1 | | 15 | 1 | MW-14-5 | | 25 | 2 | MW-20-2 | | 35 | 1 | MW-4-2MS | | 45 | | | |
| 6 | 1 | EB-2-4/21/03 | | 16 | 1 | MW-14-4 | | 26 | 2 | MW-20-1 | | 36 | 1 | MW-4-2MSD | | 46 | | | |
| 7 | 1 | Dupe-1-2Q03 | | 17 | 1 | MW-14-3 | | 27 | 2 | EB-5-4/24/03 | | 37 | 1 | MW-4-2DUP | | 47 | | | |
| 8 | 1 | Source-2Q03 | | 18 | 1 | MW-14-2 | | 28 | 2 | Dupe-3-2Q03 | | 38 | 2 | MW-19-2MS | | 48 | | | |
| 9 | 1 | MW-19-5 | | 19 | 1 | MW-14-1 | | 29 | 2 | MW-21-5 | | 39 | 2 | MW-19-2MSD | | 49 | | | |
| 10 | 1 | MW-19-4 | | 20 | 1 | EB-4-4/23/03 | | 30 | 2 | MW-21-4 | | 40 | 2 | MW-19-2DUP | | 50 | | | |

Notes:

LDC #: 10531A4 7
SDG #: 03-2931 / 062425

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

All circled elements are applicable to each sample.

| Sample ID | Matrix | Target Analyte List (TAL) |
|---|---|---|
| 1 → 34 | W | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| QC 35 → 42 | ↓ | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| **Analysis Method** | | |
| ICP | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| ICP Trace | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| ICP-MS | W | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| GFAA | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, |

Comments: Mercury by CVAA if performed

LDC #: 10531A4
SDG #: 03-2931 / 062725

# VALIDATION FINDINGS WORKSHEET
## PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MG

**METHOD:** Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: µg/L Associated Samples: all (PBW1 for # 1→11, 13→21) (PBW2 for # 12, 22→34)

| | | | | | Sample Identification | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte µg/L | PBW1 Maximum PB* ~~(mg/Kg)~~ | PBW2 Maximum PB* (ug/L) | Maximum ICB/CCB* (ug/L) | Blank Action Limit | | | | (No findings) | | | | | | | |
| Al | | | | | | | | | | | | | | | Al |
| Sb | | | | | | | | | | | | | | | Sb |
| As | | | | | | | | | | | | | | | As |
| Ba | | | | | | | | | | | | | | | Ba |
| Be | | | | | | | | | | | | | | | Be |
| Cd | | | | | | | | | | | | | | | Cd |
| Ca | | | | | | | | | | | | | | | Ca |
| Cr | 0.115 | 0.209 | 0.291 | 1.455 | | | | | | | | | | | Cr |
| Co | | | | | | | | | | | | | | | Co |
| Cu | | | | | | | | | | | | | | | Cu |
| Fe | | | | | | | | | | | | | | | Fe |
| Pb | | | | | | | | | | | | | | | Pb |
| Mg | | | | | | | | | | | | | | | Mg |
| Mn | | | | | | | | | | | | | | | Mn |
| Hg | | | | | | | | | | | | | | | Hg |
| Ni | | | | | | | | | | | | | | | Ni |
| K | | | | | | | | | | | | | | | K |
| Se | | | | | | | | | | | | | | | Se |
| Ag | | | | | | | | | | | | | | | Ag |
| Na | | | | | | | | | | | | | | | Na |
| Tl | | | | | | | | | | | | | | | Tl |
| V | | | | | | | | | | | | | | | V |
| Zn | | | | | | | | | | | | | | | Zn |
| B | | | | | | | | | | | | | | | B |
| Mo | | | | | | | | | | | | | | | Mo |
| Sr | | | | | | | | | | | | | | | Sr |

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 10531A4
SDG #: 03-2931/062725

# VALIDATION FINDINGS WORKSHEET
## Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

**METHOD**: Trace metals (EPA SW 846 Method 6010/7000)

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

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

**LEVEL IV ONLY:**

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

| # | MS/MSD ID | Matrix | Analyte | MS %Recovery | MSD %Recovery | RPD (Limits) | Associated Samples | Qualifications |
|---|---|---|---|---|---|---|---|---|
| 1 | 35/36 | water | Cr | 75.8 (80-120) | 73.6 (80-120) | | 1→11, 13→21 | J/UJ/A |
| 2 | 38/39 | water | Cr | 75.4 (80-120) | 75.1 (80-120) | | 12, 22→34 | ↓ |

Comments:

MSD.4S2

LDC #: 10531A4 7
SDG #: 03-2931/062425

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates


Reviewer: MG
2nd reviewer: MY

**METHOD:** Inorganics, Method 200.8

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 (µg/L) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | 2 | 7 | | |
| Cr | 3.5 | 2.8 | 22 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration (µg/L) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | 17 | 21 | | |
| Cr | 3.2 | 2.6 | 21 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration (µg/L) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | 26 | 28 | | |
| Cr | 2.4 | 2.1 | 13 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration ( ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**LDC Report#** 10531B4

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** April 28 through May 7, 2003

**LDC Report Date:** July 11, 2003

**Matrix:** Water

**Parameters:** Chromium & Lead

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory/Advanced Technology Laboratories

**Sample Delivery Group (SDG):** 03-3112/062913

**Sample Identification**

| | | |
|---|---|---|
| MW-17-5 | MW-3-3 | MW-17-2MSD |
| MW-17-4 | MW-3-2 | MW-17-2DUP |
| MW-17-3 | MW-3-1 | MW-23-5DUP |
| MW-17-2 | EB-9-5/1/03 | MW-11-3MS |
| MW-17-1 | DUPE-5-2Q03 | MW-11-3MSD |
| EB-6-4/28/03 | MW-11-5 | MW-11-3DUP |
| MW-24-5 | MW-11-4 | MW-24-4DUP |
| MW-24-3 | MW-11-3 | |
| MW-24-2 | MW-11-2 | |
| MW-24-1 | MW-11-1 | |
| EB-7-4/29/03 | EB-10-5/6/03 | |
| DUPE-4-2Q03 | MW-12-5 | |
| MW-23-5 | MW-12-4 | |
| MW-23-4 | MW-12-3 | |
| MW-23-3 | MW-12-2 | |
| MW-23-2 | MW-12-1 | |
| MW-23-1 | EB-11-5/7/03 | |
| EB-8-4/30/03 | DUPE-6-2Q03 | |
| MW-3-5 | MW-24-4 | |
| MW-3-4 | MW-17-2MS | |

## Introduction

This data review covers 47 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 200.8 for Chromium & Lead.

This 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 flags 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 specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

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

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

| Method Blank ID | Analyte | Maximum Concentration | Associated Samples |
|---|---|---|---|
| PB1 (prep blank) | Chromium | 0.128 ug/L | MW-17-5<br>MW-17-4<br>MW-17-3<br>MW-17-2<br>MW-17-1<br>EB-6-4/28/03<br>MW-24-5<br>MW-24-3<br>MW-24-2<br>MW-24-1<br>EB-7-4/29/03<br>DUPE-4-2Q03<br>MW-23-5<br>MW-23-4<br>MW-23-3<br>MW-23-2<br>MW-23-1<br>EB-8-4/30/03<br>MW-3-5<br>MW-3-4 |

| Method Blank ID | Analyte | Maximum Concentration | Associated Samples |
|---|---|---|---|
| ICB/CCB1 | Chromium | 0.279 ug/L | MW-17-5<br>MW-17-4<br>MW-17-3<br>MW-17-2<br>MW-17-1<br>EB-6-4/28/03<br>MW-24-5<br>MW-24-3<br>MW-24-2<br>MW-24-1<br>EB-7-4/29/03<br>DUPE-4-2Q03<br>MW-23-5<br>MW-23-4<br>MW-23-3<br>MW-23-2<br>MW-23-1<br>EB-8-4/30/03<br>MW-3-5<br>MW-3-4 |
| PB2 (prep blank) | Chromium | 0.138 ug/L | MW-3-3<br>MW-3-2<br>MW-3-1<br>EB-9-5/1/03<br>DUPE-5-2Q03<br>MW-11-5<br>MW-11-4<br>MW-11-3<br>MW-11-2<br>MW-11-1<br>EB-10-5/6/03<br>MW-12-5<br>MW-12-4<br>MW-12-3<br>MW-12-2<br>MW-12-1<br>EB-11-5/7/03<br>DUPE-6-2Q03<br>MW-24-4 |
| ICB/CCB2 | Chromium | 0.127 ug/L | MW-3-3<br>MW-3-2<br>MW-3-1<br>EB-9-5/1/03<br>DUPE-5-2Q03<br>MW-11-5<br>MW-11-4<br>MW-11-3<br>MW-11-2<br>MW-11-1<br>EB-10-5/6/03<br>MW-12-5<br>MW-12-4<br>MW-12-3<br>MW-12-2<br>MW-12-1<br>EB-11-5/7/03<br>DUPE-6-2Q03<br>MW-24-4 |

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater ( >5X blank contaminants) than the concentrations found in the associated method blanks.

**IV. ICP Interference Check Sample (ICS) Analysis**

ICP interference check was not required by the method.

**V. Matrix Spike Analysis**

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

**VI. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

**VII. Laboratory Control Samples (LCS)**

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

**VIII. Internal Standards (ICP-MS)**

Raw data were not reviewed for this SDG.

**IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

**X. ICP Serial Dilution**

ICP serial dilution was not required by the method.

**XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

**XII. Overall Assessment of Data**

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

## XIII. Field Duplicates

Samples MW-24-2 and DUPE-4-2Q03, samples MW-3-2 and DUPE-5-2Q03 and samples MW-12-3 and DUPE-6-2Q03 were identified as field duplicates. No chromium or lead was detected in any of the samples with the following exceptions:

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-24-2 | DUPE-4-2Q03 | |
| Chromium | 2.3 | 2.0 | 14 |

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-3-2 | DUPE-5-2Q03 | |
| Chromium | 1.6 | 1.9 | 17 |

| Analyte | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | MW-12-3 | DUPE-6-2Q03 | |
| Chromium | 1.3 | 1.3 | 0 |

## XIV. Field Blanks

Samples EB-6-4/28/03, EB-7-4/29/03, EB-8-4/30/03, EB-9-5/1/03, EB-10-5/6/03 and EB-11-5/7/03 were identified as equipment blanks. No chromium or lead contaminants were found in these blanks with the following exceptions:

| Equipment Blank ID | Analyte | Concentration (ug/L) |
|---|---|---|
| EB-10-5/6/03 | Chromium | 2.1 |

**NASA JPL**
**Chromium & Lead - Data Qualification Summary - SDG 03-3112/062913**

No Sample Data Qualified in this SDG

**NASA JPL**
**Chromium & Lead - Laboratory Blank Data Qualification Summary - SDG 03-3112/062913**

No Sample Data Qualified in this SDG

# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-001
**Client Sample ID:** MW-17-5
**Collection Date:** 4/28/2003 8:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.6 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-002
**Client Sample ID:** MW-17-4
**Collection Date:** 4/28/2003 9:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.2 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-003
**Client Sample ID:** MW-17-3
**Collection Date:** 4/28/2003 10:35:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 3.0 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03



*Advanced Technology Laboratories*
*3275 Walnut Avenue · Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-004
**Client Sample ID:** MW-17-2
**Collection Date:** 4/28/2003 11:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.0 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-005
**Client Sample ID:** MW-17-1
**Collection Date:** 4/28/2003 12:30:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.9 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-006
**Client Sample ID:** EB-6-4/28/03
**Collection Date:** 4/28/2003 10:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03

012

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-007
**Client Sample ID:** MW-24-5
**Collection Date:** 4/29/2003 8:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 4.1 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-008
**Client Sample ID:** MW-24-3
**Collection Date:** 4/29/2003 10:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.2 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-009
**Client Sample ID:** MW-24-2
**Collection Date:** 4/29/2003 12:10:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.3 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-010
**Client Sample ID:** MW-24-1
**Collection Date:** 4/29/2003 2:00:00 PM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 5.7 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-011
**Client Sample ID:** EB-7-4/29/03
**Collection Date:** 4/29/2003 9:55:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-012
**Client Sample ID:** DUPE-4-2Q03
**Collection Date:** 4/29/2003
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.0 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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014

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-013
**Client Sample ID:** MW-23-5
**Collection Date:** 4/30/2003 8:20:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 1.7 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-014
**Client Sample ID:** MW-23-4
**Collection Date:** 4/30/2003 9:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 2.2 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-015
**Client Sample ID:** MW-23-3
**Collection Date:** 4/30/2003 9:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: **NS** |
| Chromium | 3.7 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-016
**Client Sample ID:** MW-23-2
**Collection Date:** 4/30/2003 10:25:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.9 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-017
**Client Sample ID:** MW-23-1
**Collection Date:** 4/30/2003 11:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 4.4 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-018
**Client Sample ID:** EB-8-4/30/03
**Collection Date:** 4/30/2003 8:35:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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016

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-019
**Client Sample ID:** MW-3-5
**Collection Date:** 5/1/2003 7:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-020
**Client Sample ID:** MW-3-4
**Collection Date:** 5/1/2003 9:45:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030523A | QC Batch: R27659 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.7 | 1.0 | | µg/L | 1 | 5/23/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/23/2003 |

**Lab ID:** 062913-021
**Client Sample ID:** MW-3-3
**Collection Date:** 5/1/2003 9:25:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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017

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-022
**Client Sample ID:** MW-3-2
**Collection Date:** 5/1/2003 10:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.6 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-023
**Client Sample ID:** MW-3-1
**Collection Date:** 5/1/2003 11:30:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.1 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-024
**Client Sample ID:** EB-9-5/1/03
**Collection Date:** 5/1/2003 8:05:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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018

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-025
**Client Sample ID:** DUPE-52Q03
**Collection Date:** 5/1/2003
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.9 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-026
**Client Sample ID:** MW-11-5
**Collection Date:** 5/6/2003 7:55:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.1 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-027
**Client Sample ID:** MW-11-4
**Collection Date:** 5/6/2003 8:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-028
**Client Sample ID:** MW-11-3
**Collection Date:** 5/6/2003 9:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.5 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-029
**Client Sample ID:** MW-11-2
**Collection Date:** 5/6/2003 10:30:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-030
**Client Sample ID:** MW-11-1
**Collection Date:** 5/6/2003 11:05:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.3 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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020

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-031
**Client Sample ID:** EB-10-5/6/03
**Collection Date:** 5/6/2003 8:55:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.1 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-032
**Client Sample ID:** MW-12-5
**Collection Date:** 5/7/2003 7:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.2 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-033
**Client Sample ID:** MW-12-4
**Collection Date:** 5/7/2003 8:30:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.3 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

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021

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# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-034
**Client Sample ID:** MW-12-3
**Collection Date:** 5/7/2003 9:40:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.3 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-035
**Client Sample ID:** MW-12-2
**Collection Date:** 5/7/2003 10:20:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 2.9 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-036
**Client Sample ID:** MW-12-1
**Collection Date:** 5/7/2003 11:00:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 9.7 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/07

022

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

# Advanced Technology Laboratories

**Date:** *29-May-03*

**CLIENT:** Applied P & Ch Laboratories
**Project:** #3112, JPL
**Lab Order:** 062913

**Lab ID:** 062913-037
**Client Sample ID:** EB-11-5/7/03
**Collection Date:** 5/7/2003 8:50:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-038
**Client Sample ID:** DUPE-6-2Q03
**Collection Date:** 5/7/2003
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | 1.3 | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Lab ID:** 062913-039
**Client Sample ID:** MW-24-4
**Collection Date:** 4/29/2003 9:35:00 AM
**Matrix:** WATER

| Analyte | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| **EPA 200.8** | | | | | | |
| RunID: ICP4_030527A | QC Batch: R27686 | | | PrepDate: | | Analyst: NS |
| Chromium | ND | 1.0 | | µg/L | 1 | 5/27/2003 |
| Lead | ND | 1.0 | | µg/L | 1 | 5/27/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

7/14/03

023

*Advanced Technology Laboratories*
*3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040*

LDC #: 10531B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 7-9-03

SDG #: 03-3112/062913 Level III Page: 1 of 1

Laboratory: Applied P & Ch Laboratory/Advanced Technology Laboratories Reviewer: MG

2nd Reviewer: MM

**METHOD:** Chromium & Lead (EPA Method 200.8)

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: 4-28-03 through 5-7-03 |
| II. | Calibration | A | |
| III. | Blanks | SW | |
| IV. | ICP Interference Check Sample (ICS) Analysis | N | Not required |
| V. | Matrix Spike Analysis | A | |
| VI. | Duplicate Sample Analysis | A | |
| VII. | Laboratory Control Samples (LCS) | A | LCS |
| VIII. | Internal Standard (ICP-MS) | N | Not reviewed |
| IX. | Furnace Atomic Absorption QC | N | Not utilized |
| X. | ICP Serial Dilution | N | Not required |
| XI. | Sample Result Verification | N | |
| XII. | Overall Assessment of Data | A | |
| XIII. | Field Duplicates | SW | D=9+12, D=22+25, D=34+38 |
| XIV. | Field Blanks | SW | EB= 6*, 11*, 18*, 24*, 31, 37* |

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; * = N.D.

Validated Samples:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | MW-17-5 | W | 11 | 1 | EB-7-4/29/03 | W | 21 | 2 | MW-3-3 | W | 31 | 2 | EB-10-5/6/03 | W | 41 | 1 | MW-17-2MSD | W |
| 2 | 1 | MW-17-4 | | 12 | 1 | DUPE-4-2Q03 | | 22 | 2 | MW-3-2 | | 32 | 2 | MW-12-5 | | 42 | 1 | MW-17-2DUP | |
| 3 | 1 | MW-17-3 | | 13 | 1 | MW-23-5 | | 23 | 2 | MW-3-1 | | 33 | 2 | MW-12-4 | | 43 | 1 | MW-23-5DUP | |
| 4 | 1 | MW-17-2 | | 14 | 1 | MW-23-4 | | 24 | 2 | EB-9-5/1/03 | | 34 | 2 | MW-12-3 | | 44 | 2 | MW-11-3MS | |
| 5 | 1 | MW-17-1 | | 15 | 1 | MW-23-3 | | 25 | 2 | DUPE-5-2Q03 | | 35 | 2 | MW-12-2 | | 45 | 2 | MW-11-3MSD | |
| 6 | 1 | EB-6-4/28/03 | | 16 | 1 | MW-23-2 | | 26 | 2 | MW-11-5 | | 36 | 2 | MW-12-1 | | 46 | 2 | MW-11-3DUP | |
| 7 | 1 | MW-24-5 | | 17 | 1 | MW-23-1 | | 27 | 2 | MW-11-4 | | 37 | 2 | EB-11-5/7/03 | | 47 | 2 | MW-24-4DUP | |
| 8 | 1 | MW-24-3 | | 18 | 1 | EB-8-4/30/03 | | 28 | 2 | MW-11-3 | | 38 | 2 | DUPE-6-2Q03 | | 48 | 1 | PBW1 | |
| 9 | 1 | MW-24-2 | | 19 | 1 | MW-3-5 | | 29 | 2 | MW-11-2 | | 39 | 2 | MW-24-4 | | 49 | 2 | PBW2 | |
| 10 | 1 | MW-24-1 | | 20 | 1 | MW-3-4 | | 30 | 2 | MW-11-1 | | 40 | 1 | MW-17-2MS | | 50 | | | |

Notes:

LDC #: 10531B4
SDG #: 03-3112/062913

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

All circled elements are applicable to each sample.

| Sample ID | Matrix | Target Analyte List (TAL) |
|---|---|---|
| 1→39 | W | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| QC 40→47 | ↓ | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| **Analysis Method** | | |
| ICP | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| ICP Trace | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| ICP-MS | W | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___ |
| GFAA | | Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ |

Comments: Mercury by CVAA if performed

LDC #: 10531B4
SDG #: 03-3112/062913

# VALIDATION FINDINGS WORKSHEET
## PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

**METHOD:** Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: µg/L Associated Samples: 1 → 20 (No findings)

| | | | | | Sample Identification | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte | Maximum PB[a] (mg/Kg) | Maximum PB[a] (ug/L) | Maximum ICB/CCB[a] (ug/L) | Blank Action Limit | | | | | | | | | | | |
| Al | | | | | | | | | | | | | | | Al |
| Sb | | | | | | | | | | | | | | | Sb |
| As | | | | | | | | | | | | | | | As |
| Ba | | | | | | | | | | | | | | | Ba |
| Be | | | | | | | | | | | | | | | Be |
| Cd | | | | | | | | | | | | | | | Cd |
| Ca | | | | | | | | | | | | | | | Ca |
| Cr | | 0.128 | 0.279 | 1.395 | | | | | | | | | | | Cr |
| Co | | | | | | | | | | | | | | | Co |
| Cu | | | | | | | | | | | | | | | Cu |
| Fe | | | | | | | | | | | | | | | Fe |
| Pb | | | | | | | | | | | | | | | Pb |
| Mg | | | | | | | | | | | | | | | Mg |
| Mn | | | | | | | | | | | | | | | Mn |
| Hg | | | | | | | | | | | | | | | Hg |
| Ni | | | | | | | | | | | | | | | Ni |
| K | | | | | | | | | | | | | | | K |
| Se | | | | | | | | | | | | | | | Se |
| Ag | | | | | | | | | | | | | | | Ag |
| Na | | | | | | | | | | | | | | | Na |
| Tl | | | | | | | | | | | | | | | Tl |
| V | | | | | | | | | | | | | | | V |
| Zn | | | | | | | | | | | | | | | Zn |
| B | | | | | | | | | | | | | | | B |
| Mo | | | | | | | | | | | | | | | Mo |
| Sr | | | | | | | | | | | | | | | Sr |

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 10531B4
SDG #: 03-3112/062913

# VALIDATION FINDINGS WORKSHEET
## PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

**METHOD:** Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: µg/L Associated Samples: 21→39 (No findings)

| | | | | | Sample Identification | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte | Maximum PB* (mg/Kg) | Maximum PB* (ug/L) | Maximum ICB/CCB* (ug/L) | Blank Action Limit | | | | | | | | | | | |
| Al | | | | | | | | | | | | | | | Al |
| Sb | | | | | | | | | | | | | | | Sb |
| As | | | | | | | | | | | | | | | As |
| Ba | | | | | | | | | | | | | | | Ba |
| Be | | | | | | | | | | | | | | | Be |
| Cd | | | | | | | | | | | | | | | Cd |
| Ca | | | | | | | | | | | | | | | Ca |
| Cr | | 0.138 | 0.127 | 0.690 | | | | | | | | | | | Cr |
| Co | | | | | | | | | | | | | | | Co |
| Cu | | | | | | | | | | | | | | | Cu |
| Fe | | | | | | | | | | | | | | | Fe |
| Pb | | | | | | | | | | | | | | | Pb |
| Mg | | | | | | | | | | | | | | | Mg |
| Mn | | | | | | | | | | | | | | | Mn |
| Hg | | | | | | | | | | | | | | | Hg |
| Ni | | | | | | | | | | | | | | | Ni |
| K | | | | | | | | | | | | | | | K |
| Se | | | | | | | | | | | | | | | Se |
| Ag | | | | | | | | | | | | | | | Ag |
| Na | | | | | | | | | | | | | | | Na |
| Tl | | | | | | | | | | | | | | | Tl |
| V | | | | | | | | | | | | | | | V |
| Zn | | | | | | | | | | | | | | | Zn |
| B | | | | | | | | | | | | | | | B |
| Mo | | | | | | | | | | | | | | | Mo |
| Sr | | | | | | | | | | | | | | | Sr |

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 1053184
SDG #: 03-3112/062913

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

**METHOD:** Inorganics, Method 200.8

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 (µg/L) 9 | 12 | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| Cr | 2.3 | 2.0 | 14 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration (µg/L) 22 | 25 | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| Cr | 1.6 | 1.9 | 17 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration (µg/L) 34 | 38 | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| Cr | 1.3 | 1.3 | 0 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration ( ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

LDC #: 10531B4
SDG #: 03-3112/062913

# VALIDATION FINDINGS WORKSHEET
## Field Blanks

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

**METHOD:** Trace Metals (EPA SW 846 Method 6010/7000)

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

Sample: 31 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

| Analyte | Concentration Units (µg/L) |
|---|---|
| Cr | 2.1 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

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

| Analyte | Concentration Units ( ) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |