

## **ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY**

This attachment summarizes the field quality assurance, laboratory quality assurance, data verification and data validation procedures utilized for the JPL groundwater monitoring program. Data validation was performed by an independent subcontractor, Laboratory Data Consultants, Inc. of Carlsbad, California. Data verification and validation indicated that the all volatile organic carbon (VOC), perchlorate and metal results obtained from the 4th quarter 2008 sampling event were acceptable for their intended use of characterizing aquifer quality.

## **ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY**

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A comprehensive QA/QC plan for groundwater monitoring is described in detail in the Quality Assurance Project Plan for the Groundwater Monitoring Plan (Ebasco, 1993). Field and laboratory QC samples were used to fulfill QA requirements. Proper sample acquisition and handling procedures were utilized to ensure the integrity of the analytical results.

### **FIELD QUALITY ASSURANCE/QUALITY CONTROL**

The field QA/QC samples collected for JPL groundwater monitoring included duplicate samples, equipment rinsate blanks and trip blanks. The QC sample results were used for the qualitative evaluation of the aquifer recovery. Table 1-1 presents a summary of the contaminants detected in quality control samples collected during the 4th quarter 2008 sampling event.

**Duplicate Field Samples.** Duplicate samples were used to evaluate the precision of the laboratory analyses. Duplicate samples for volatile organic compounds (VOCs), perchlorate, total chromium and hexavalent chromium [Cr(VI)] were collected from monitoring wells MW-3 (Screen 1), MW-11 (Screen 4), MW-14 (Screen 3), MW-17 (Screen 4), MW-18 (Screen 4), MW-21 (Screen 1), MW-22 (Screen 2) and MW-24 (Screen 3).

The analytical results for the duplicate samples were comparable to the results of the original groundwater samples for VOCs (Table 1) and Metals (Table 2).

**Equipment Rinsate Blanks.** Equipment rinsate blanks were collected each day that non-dedicated sampling equipment was used. The equipment rinsate blanks, consisting of distilled water run through the sampling equipment after decontamination, were analyzed for all contaminants of concern to monitor possible cross-contamination of samples due to inadequate decontamination. Chloroform was detected in 4 of 16 equipment blanks near the reporting limit of 0.5 µg/L as shown in Table 1-1. The source of the chloroform detections in the equipment blanks could not be determined. Detections in the equipment blanks were compared to the sample results during the data validation process to determine the impact on the sample results.

The tentatively identified compound (TIC), isobutylene (CAS number 115-11-7) was detected in five equipment blanks associated with wells MW-11, MW-12, MW-14, MW-24 and MW-25 at concentrations of 3.8 µg/L, 3.6 µg/L, 4.4 µg/L, 3.4 µg/L and 6.4 µg/L respectively, as shown in Table 4.

**Trip Blanks.** Trip blanks, which consisted of reagent-grade water placed in a vial and transported with the sample bottles to and from the field, were submitted to the laboratory with each shipment of groundwater samples. Trip blanks were used to help identify cross-contamination of groundwater samples during transport and sample handling procedures. No VOC contaminants were detected in any of the trip blanks as shown in Table 1-1.

The TIC sulfur dioxide was detected in one trip blank associated with wells MW-8 and MW-13, at a concentration of 2.6 µg/L, as shown in Table 4.

**Source Blank.** A source blank consists of distilled water used by sampling personnel for equipment decontamination. The source blank is collected at the sampling site and preserved, as appropriate. This QC sample serves as a check on contamination present in the source water. No source blank was collected during the 4th quarter 2008 sampling event. However, the same source of decontamination water was collected in the second quarter 2008 sampling event and no contaminants were detected in the source blank.

#### **LABORATORY QUALITY ASSURANCE/QUALITY CONTROL**

Laboratory QC samples included surrogate compounds (for VOC analyses), matrix spike samples, blank spike samples, and method blanks. The results of the laboratory QC samples were used by the laboratory to determine the accuracy and precision of the analytical techniques, and to identify anomalous results due to laboratory contamination or instrument malfunction.

#### **DATA VERIFICATION AND VALIDATION**

The purpose of data verification and validation is to assure that the data collected meet the data quality objectives (DQOs) outlined in the Quality Assurance Project Plan of the Groundwater Monitoring Plan (Ebasco, 1993). Data verification and validation indicated that all of the sample results obtained from the 4th quarter 2008 sampling event were acceptable for their intended use of characterizing aquifer quality.

**Data Verification.** All data collected were subjected to data verification. Data verification is a review of the analytical data that includes confirming that the sample identification numbers on the laboratory reports match those on the chain-of-custody records. Data verification also includes a review of the analytical data reports to confirm that all samples were analyzed and all required analytes were quantified for each sample.

**Data Validation.** Data validation is a systematic review of the analytical data that is used to determine the compliance of the established method performance criteria and determine whether the data quality is sufficient to support the data quality objectives. Validation of a data package included review of the technical holding time requirements, review of sample preparation, review of the initial and continuing calibration data, review and recalculation of the laboratory QC sample data, review of the equipment performance, reconciliation of the raw data with the reduced results, identification of data anomalies, and qualification of data to identify data usability limitations.

Data validation was performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, CA. One hundred percent of the data provided by

Alpha Analytical, Inc. of Sparks, Nevada and Columbia Analytical Services, Inc. (CAS) of Kelso, Washington were validated. Ninety percent of the data were subjected to Level III validation and ten percent of the data were subjected to Level IV validation in accordance with the EPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic/Inorganic Data Review (U.S. EPA, 1999; 2004). The data were evaluated to ensure suitability and usability for the purpose of the groundwater monitoring report.

***Data Validation Qualifiers.*** Analytical data were qualified based on data validation. Data qualifiers were assigned in accordance with EPA guidelines. All samples were analyzed within the analytical holding times.

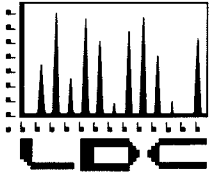
The data validation reports are included in Attachment 2.

## REFERENCES

- Ebasco. 1993. *Work Plan for Performing a Remedial Investigation/Feasibility Study*. National Aeronautics and Space Administration Jet Propulsion Laboratory, Pasadena, California. December.
- U.S. EPA. 1999. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*. February.
- U.S. EPA. 2004. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. December.

## **ATTACHMENT 2: DATA VALIDATION REPORTS (SUMMARY SHEETS)**

This attachment contains the summary sheets from the data validation performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC), Carlsbad, California. Complete data validation reports are available upon request.



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 5, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed is the final validation report for the fraction listed below. This SDG was received on November 3, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19706:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803489	Hexavalent Chromium

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist





**NASA JPL  
Data Validation Reports  
LDC# 19706**

Hexavalent Chromium

*LDC*

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 21, 2008  
**LDC Report Date:** November 4, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803489

**Sample Identification**

MW-21-5  
MW-21-4\*\*  
MW-21-3  
MW-21-2  
MW-21-1  
DUPE-01-4Q08  
EB-01-10/21/08  
MW-21-4MS  
MW-21-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-21-1 and DUPE-01-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

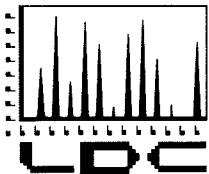
Sample EB-01-10/21/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803489**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803489**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 17, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on November 7, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19741:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803507, P0803530	Hexavalent Chromium

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist





**NASA JPL  
Data Validation Reports  
LDC# 19741**

Hexavalent Chromium

*LDC*

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 22, 2008  
**LDC Report Date:** November 12, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803507

**Sample Identification**

MW-19-5  
MW-19-4\*\*  
MW-19-3  
MW-19-2  
MW-19-1  
EB-02-10/22/08  
MW-19-5MS  
MW-19-5MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-02-10/22/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803507**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803507**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 23, 2008  
**LDC Report Date:** November 12, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.

**Sample Delivery Group (SDG):** P0803530

**Sample Identification**

MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
EB-03-10/23/08  
MW-20-5MS  
MW-20-5MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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



## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

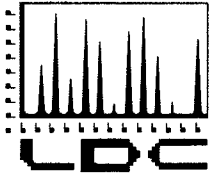
Sample EB-03-10/23/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803530**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803530**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 18, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on November 11, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19758:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803553, P0803567, P0803577, P0803590, P0803610	Hexavalent Chromium

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 24, 2008  
**LDC Report Date:** November 17, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.

**Sample Delivery Group (SDG):** P0803553

**Sample Identification**

MW-18-5\*\*  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
DUPE-02-4Q08\*\*  
EB-04-10/24/08  
MW-18-1MS  
MW-18-1MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.



## **IX. Field Duplicates**

Samples MW-18-4 and DUPE-02-4Q08\*\* were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

Sample EB-04-10/24/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803553**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803553**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 27, 2008  
**LDC Report Date:** November 17, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803567

**Sample Identification**

MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
DUPE-03-4Q08  
EB-05-10/27/08  
MW-17-1MS  
MW-17-1MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
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- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-17-4 and DUPE-03-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

Sample EB-05-10/27/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803567**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803567**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 28, 2008  
**LDC Report Date:** November 17, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803577

**Sample Identification**

MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
DUPE-04-4Q08  
EB-06-10/28/08  
MW-3-5MS  
MW-3-5MSD



## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-3-1 and DUPE-04-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

Sample EB-06-10/28/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803577**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803577**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 29, 2008  
**LDC Report Date:** November 17, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803590

**Sample Identification**

MW-14-5\*\*  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1\*\*  
DUPE-05-4Q08  
EB-07-10/29/08  
MW-14-4MS  
MW-14-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-14-3 and DUPE-05-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

Sample EB-07-10/29/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.



**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803590**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803590**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 30, 2008  
**LDC Report Date:** November 17, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803610

**Sample Identification**

- MW-22-5
- MW-22-4\*\*
- MW-22-3
- MW-22-2
- MW-22-1
- DUPE-06-4Q08
- EB-08-10/30/08
- MW-22-5MS
- MW-22-5MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-22-2 and DUPE-06-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

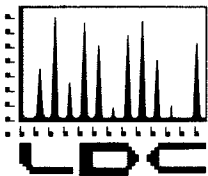
Sample EB-08-10/30/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803610**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803610**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 18, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed is the final validation reports for the fraction listed below. This SDG were received on November 17, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19793:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803634	Hexavalent Chromium

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist





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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 31, 2008  
**LDC Report Date:** November 18, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.

**Sample Delivery Group (SDG):** P0803634

**Sample Identification**

MW-4-5  
MW-4-4\*\*  
MW-4-3  
MW-4-2  
MW-4-1  
EB-09-10/31/08  
MW-4-4MS  
MW-4-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

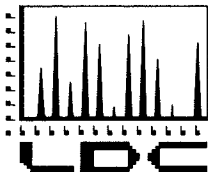
Sample EB-09-10/31/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803634**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803634**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 24, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed is the final validation report for the fraction listed below. This SDG were received on November 19, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19822:**


<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803648	Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

  
Erinda T. Rauto  
Operations Manager/Senior Chemist



**NASA JPL  
Data Validation Reports  
LDC# 19822**

Hexavalent Chromium

*LDC*



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 3, 2008  
**LDC Report Date:** November 21, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.

**Sample Delivery Group (SDG):** P0803648

**Sample Identification**

MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2  
MW-12-1  
EB-10-11/3/08  
MW-12-5MS  
MW-12-5MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

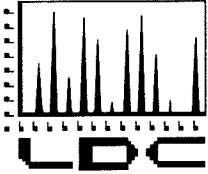
Sample EB-10-11/3/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803648**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803648**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

November 24, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on November 20, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19826:**

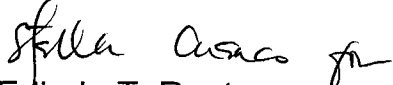
<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803661, P0803680	Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

  
Erinda T. Rauto  
Operations Manager/Senior Chemist



**NASA JPL  
Data Validation Reports  
LDC# 19826**

Hexavalent Chromium

*LDC*



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 4, 2008  
**LDC Report Date:** November 20, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803661

**Sample Identification**

MW-11-5  
MW-11-4  
MW-11-3  
MW-11-2  
MW-11-1  
DUPE-07-4Q08  
EB-11-11/4/08  
MW-11-1MS  
MW-11-1MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-11-4 and DUPE-07-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

Sample EB-11-11/4/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803661**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803661**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2008  
**LDC Report Date:** November 20, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803680

**Sample Identification**

MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
MW-24-1  
DUPE-08-4Q08  
EB-12-11/5/08  
MW-24-5MS  
MW-24-5MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.



## **IX. Field Duplicates**

Samples MW-24-3 and DUPE-08-4Q08 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

## **X. Field Blanks**

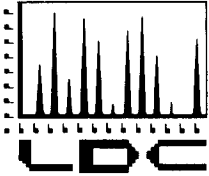
Sample EB-12-11/5/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803680**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803680**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 2, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on November 24, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19840:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803704	Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2008  
**LDC Report Date:** November 25, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803704

**Sample Identification**

MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1  
EB-13-11/06/08  
MW-25-5MS  
MW-25-5MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-13-11/06/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

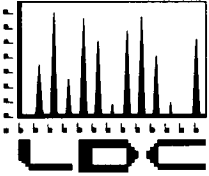
**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803704**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803704**

No Sample Data Qualified in this SDG





**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 2, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on November 24, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19844:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803721	Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

  
Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7, 2008  
**LDC Report Date:** November 25, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803721

**Sample Identification**

MW-26-2  
MW-26-1  
EB-14-11/07/08  
MW-26-1MS  
MW-26-1MSD

## Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

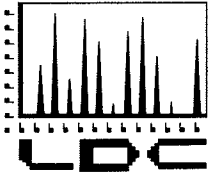
Sample EB-14-11/07/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803721**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803721**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 5, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 24, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19848:**

**SDG #**

**Fraction**

BMI08102258, BMI08102324

Volatiles, Chromium, Perchlorate

The data validation was performed under EPA Level III and Level IV 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, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



PO 214320 90/10 (client select) LDC #19848 (Battelle-San Diego / NASA JPL)

LDC	SDG#	DATE REC'D	DATE DUE (3)	VOA (524.2)		Cr (200.8)		CLO <sub>4</sub> (314.0)		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						
Matrix: Water/Soil																																	
A	BMI08102258	11/24/08	12/17/08	9	0	8	0	8	0																								
A	BMI08102258	11/24/08	12/17/08	1	0	1	0	1	0																								
B	BMI08102324	11/24/08	12/17/08	6	0	5	0	5	0																								
B	BMI08102324	11/24/08	12/17/08	1	0	1	0	1	0																								
Total				17	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47							
				T/LR																													

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** October 21, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102258

### Sample Identification

MW-21-5  
MW-21-4\*\*  
MW-21-3  
MW-21-2  
MW-21-1  
DUPE-01-4Q08  
TB-01-10/21/08  
EB-01-10/21/08  
MW-21-4MS  
MW-21-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 10 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Flag	A or P
10/28/08	Dichlorodifluoromethane	30.8	All samples in SDG BMI08102258	J (all detects) UJ (all non-detects)	P

## V. Blanks

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

## VI. Surrogate Spikes

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

## VII. Matrix Spike/Matrix Spike Duplicates

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.

## VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCSMS15W1028K5	Dichlorodifluoromethane	69 (70-130)	All samples in SDG BMI08102258	J (all detects) UJ (all non-detects)	P

## 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

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XIV. System Performance

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

### XVI. Field Duplicates

Samples MW-21-1 and DUPE-01-4Q08 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-21-1	DUPE-01-4Q08	
Chloroform	0.50U	0.52	200

### XVII. Field Blanks

Sample TB-01-10/21/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-01-10/21/08 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-01-10/21/08	Chloroform	0.76

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08102258**

SDG	Sample	Compound	Flag	A or P	Reason
BMI08102258	MW-21-5 MW-21-4** MW-21-3 MW-21-2 MW-21-1 DUPE-01-4Q08 TB-01-10/21/08 EB-01-10/21/08	Dichlorodifluoromethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI08102258	MW-21-5 MW-21-4** MW-21-3 MW-21-2 MW-21-1 DUPE-01-4Q08 TB-01-10/21/08 EB-01-10/21/08	Dichlorodifluoromethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08102258**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 22, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102324

**Sample Identification**

MW-19-5  
MW-19-4\*\*  
MW-19-3  
MW-19-2  
MW-19-1  
EB-02-10/22/08  
TB-02-10/22/08

\*\*Indicates sample underwent EPA Level IV review



## Introduction

This data review covers 7 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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 all compounds.

## **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.

## **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**

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

## **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**

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Compound Quantitation and CRQLs**

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XIII. Tentatively Identified Compounds (TICs)**

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XIV. System Performance**

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Sample TB-02-10/22/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-02-10/22/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 21, 2008  
**LDC Report Date:** November 26, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08102258

**Sample Identification**

MW-21-5  
MW-21-4\*\*  
MW-21-3  
MW-21-2  
MW-21-1  
DUPE-01-4Q08  
EB-01-10/21/08  
MW-21-4MS  
MW-21-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-21-1 and DUPE-01-4Q08 were identified as field duplicates. No chromium was detected in any of the samples

## **XIV. Field Blanks**

Sample EB-01-10/21/08 was identified as an equipment blank. No chromium was found in this blank.



**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08102258**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08102258**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 22, 2008  
**LDC Report Date:** November 26, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08102324

**Sample Identification**

MW-19-5  
MW-19-4\*\*  
MW-19-3  
MW-19-2  
MW-19-1  
EB-02-10/22/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Sample EB-02-10/22/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 21, 2008  
**LDC Report Date:** November 26, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08102258

**Sample Identification**

MW-21-5  
MW-21-4\*\*  
MW-21-3  
MW-21-2  
MW-21-1  
DUPE-01-4Q08  
EB-01-10/21/08  
MW-21-4MS  
MW-21-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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



## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### IX. Field Duplicates

Samples MW-21-1 and DUPE-01-4Q08 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-21-1	DUPE-01-4Q08	
Perchlorate	2.95	2.92	1

### X. Field Blanks

Sample EB-01-10/21/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08102258**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08102258**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 22, 2008  
**LDC Report Date:** November 26, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08102324

**Sample Identification**

MW-19-5  
MW-19-4\*\*  
MW-19-3  
MW-19-2  
MW-19-1  
EB-02-10/22/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

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

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-02-10/22/08 was identified as an equipment blank. No perchlorate was found in this blank.

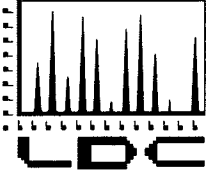
**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08102324**

No Sample Data Qualified in this SDG





**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 4, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on December 1, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19870:**

**SDG #**

**Fraction**

P0803736, P0803748, P0803764,  
P0803787, P0803836. P0803853

Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 10, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803736

**Sample Identification**

MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2  
MW-23-1  
EB-15-11/10/08  
MW-23-5MS  
MW-23-5MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-15-11/10/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803736**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803736**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 11, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803748

**Sample Identification**

MW-7  
MW-16  
MW-7MS  
MW-7MSD



## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803748**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803748**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803764

**Sample Identification**

MW-10  
MW-15  
MW-10MS  
MW-10MSD

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.



**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803764**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803764**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803787

**Sample Identification**

MW-13  
MW-8  
MW-13MS  
MW-13MSD

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803787**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803787**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 17, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803836

**Sample Identification**

MW-01\*\*  
MW-09  
MW-01MS  
MW-01MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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



## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803836**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803836**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 18, 2008  
**LDC Report Date:** December 2, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P0803853

**Sample Identification**

MW-20-5RS  
MW-20-4RS  
MW-20-3RS  
MW-20-2RS  
MW-20-1RS  
EB-16-11/18/08  
MW-20-5RSMS  
MW-20-5RSMSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-16-11/18/08 was identified as an equipment blank. No hexavalent chromium was found in this blank.

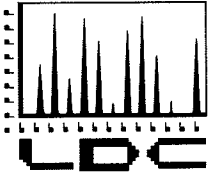
**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803853**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803853**

No Sample Data Qualified in this SDG





**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 17, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19879:**

**SDG #**

**Fraction**

BMI08102424, BMI08102802, BMI08102956, BMI08103002, BMI08103106	Volatiles, Chromium, Perchlorate
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The data validation was performed under EPA Level III and Level IV 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, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist

**LDC #19879 (Battelle-San Diego / NASA JPL)**

90/10 (client select)

PO 214320

LDC	SDG#	DATE REC'D	DATE DUE (3)	VOA (524.2)		Cr (200.8)		CLO <sub>4</sub> (314.0)		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	W	S	W	S	W	S	W	S	W	S	W	S	W	S		
Matrix: Water/Soil																																							
A	BMI08102424	12/01/08	12/22/08	9	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
B	BMI08102802	12/01/08	12/22/08	17	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B	BMI08102802	12/01/08	12/22/08	3	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
C	BMI08102956	12/01/08	12/22/08	10	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
D	BMI08103002	12/01/08	12/22/08	8	0	5	0	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
D	BMI08103002	12/01/08	12/22/08	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	BMI08103106	12/01/08	12/22/08	7	0	8	0	8	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
E	BMI08103106	12/01/08	12/22/08	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total				57	0	47	0	47	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	
T/LR																																							

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

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** October 23, 2008  
**LDC Report Date:** December 12, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102424

### Sample Identification

MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
EB-03-10/23/08  
TB-03-10/23/08  
MW-20-2MS  
MW-20-2MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.

## **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**

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.

### **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 are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

### **XVII. Field Blanks**

Sample TB-03-10/23/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-03-10/23/08 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-03-10/23/08	Chloroform	0.61

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 24 through October 27, 2008  
**LDC Report Date:** December 12, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102802

**Sample Identification**

MW-18-5\*\*  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
DUPE-02-4Q08\*\*  
EB-04-10/24/08  
TB-04-10/24/08  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
DUPE-03-4Q08  
EB-05-10/27/08  
TB-05-10/27/08  
MW-18-1MS  
MW-18-1MSD  
MW-17-1MS  
MW-17-1MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 20 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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.

## **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**

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)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-17-1MS/MSD (MW-17-1)	Bromomethane	-	-	20.9 (≤20)	J (all detects) UJ (all non-detects)	A

### 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

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### XIV. System Performance

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

## XVI. Field Duplicates

Samples MW-18-4 and DUPE-02-4Q08\*\* and samples MW-17-4 and DUPE-03-4Q08 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-18-4	DUPE-02-4Q08**	
Chloroform	2.1	2.1	0
Carbon tetrachloride	11	11	0
Trichloroethene	1.4	1.4	0
Tetrachloroethene	0.50	0.52	4

Compound	Concentration (ug/L)		RPD
	MW-17-5	DUPE-03-4Q08	
Trichloroethene	0.73	0.84	14

## XVII. Field Blanks

Samples TB-04-10/24/08 and TB-05-10/27/08 were identified as trip blanks. No volatile contaminants were found in these blanks.

Samples EB-04-10/24/08 and EB-05-10/27/08 were identified as equipment blanks. No volatile contaminants were found in these blanks.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08102802**

<b>SDG</b>	<b>Sample</b>	<b>Compound</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI08102802	MW-17-1	Bromomethane	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08102802**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 28, 2008  
**LDC Report Date:** December 12, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102956

**Sample Identification**

MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
DUPE-04-4Q08  
TB-06-10/28/08  
EB-06-10/28/08  
MW-3-5MS  
MW-3-5MSD

## Introduction

This data review covers 10 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.

## **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**

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.

### **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 are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

Samples MW-3-1 and DUPE-04-4Q08 were identified as field duplicates. No volatiles were detected in any of the samples.

### **XVII. Field Blanks**

Sample TB-06-10/28/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-06-10/28/08 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-06-10/28/08	Chloroform	0.60

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 29, 2008  
**LDC Report Date:** December 12, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08103002

**Sample Identification**

MW-14-5\*\*  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1\*\*  
DUPE-05-4Q08  
TB-07-10/29/08  
EB-07-10/29/08  
MW-14-4MS  
MW-14-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 10 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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.

## **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**

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.

## **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**

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Compound Quantitation and CRQLs**

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XIII. Tentatively Identified Compounds (TICs)**

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XIV. System Performance**

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

Samples MW-14-3 and DUPE-05-4Q08 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:



Compound	Concentration (ug/L)		RPD
	MW-14-3	DUPE-05-4Q08	
Trichloroethene	1.6	1.4	13
Tetrachloroethene	0.64	0.60	6

## XVII. Field Blanks

Sample TB-07-10/29/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-07-10/29/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 30, 2008  
**LDC Report Date:** December 12, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08103106

**Sample Identification**

MW-22-5  
MW-22-4\*\*  
MW-22-3  
MW-22-2  
MW-22-1  
DUPE-06-4Q08  
EB-08-10/30/08  
TB-08-10/30/08

\*\*Indicates sample underwent EPA Level IV review

## 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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.

## **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**

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.

### **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**

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XII. Compound Quantitation and CRQLs**

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XIII. Tentatively Identified Compounds (TICs)**

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XIV. System Performance**

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

Samples MW-22-2 and DUPE-06-4Q08 were identified as field duplicates. No volatiles were detected in any of the samples.

## **XVII. Field Blanks**

Sample TB-08-10/30/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-08-10/30/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 23, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08102424

**Sample Identification**

MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
EB-03-10/23/08  
MW-20-2MS  
MW-20-2MSD

## 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 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Sample EB-03-10/23/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 24 through October 27, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102802

**Sample Identification**

MW-18-5\*\*  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
DUPE-02-4Q08\*\*  
EB-04-10/24/08  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
DUPE-03-4Q08  
EB-05-10/27/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.



## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-18-4 and DUPE-02-4Q08\*\* and samples MW-17-4 and DUPE-03-4Q08 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Samples EB-04-10/24/08 and EB-05-10/27/08 were identified as equipment blanks. No chromium was found in these blanks.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08102802**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08102802**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 28, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08102956

**Sample Identification**

MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
DUPE-04-4Q08  
EB-06-10/28/08  
MW-3-5MS  
MW-3-5MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-3-1 and DUPE-04-4Q08 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Sample EB-06-10/28/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 29, 2008  
**LDC Report Date:** December 5, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08103002

**Sample Identification**

MW-14-5\*\*  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1\*\*  
DUPE-05-4Q08  
EB-07-10/29/08

\*\*Indicates sample underwent EPA Level IV review



## Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-14-3 and DUPE-05-4Q08 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Sample EB-07-10/29/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 30, 2008  
**LDC Report Date:** December 5, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08103106

**Sample Identification**

MW-22-5  
MW-22-4\*\*  
MW-22-3  
MW-22-2  
MW-22-1  
DUPE-06-4Q08  
EB-08-10/30/08  
MW-22-4MS  
MW-22-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-22-2 and DUPE-06-4Q08 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Sample EB-08-10/30/08 was identified as an equipment blank. No chromium was found in this blank.



**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 23, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08102424

**Sample Identification**

MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
EB-03-10/23/08  
MW-20-2MS  
MW-20-2MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample EB-03-10/23/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL**

**Perchlorate - Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG

**NASA JPL**

**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08102424**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 24 through October 27, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical Services, Inc.

**Sample Delivery Group (SDG):** BMI08102802

**Sample Identification**

MW-18-5\*\*  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
DUPE-02-4Q08\*\*  
EB-04-10/24/08  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
DUPE-03-4Q08  
EB-05-10/27/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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



## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### IX. Field Duplicates

Samples MW-18-4 and DUPE-02-4Q08\*\* and samples MW-17-4 and DUPE-03-4Q08 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-18-4	DUPE-02-4Q08**	
Perchlorate	34.3	35.5	3

### X. Field Blanks

Samples EB-04-10/24/08 and EB-05-10/27/08 were identified as equipment blanks. No perchlorate was found in these blanks.

**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08102802**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08102802**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 28, 2008  
**LDC Report Date:** December 4, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08102956

**Sample Identification**

MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
DUPE-04-4Q08  
EB-06-10/28/08  
MW-3-5MS  
MW-3-5MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-3-1 and DUPE-04-4Q08 were identified as field duplicates. No perchlorate was detected in any of the samples.

## **X. Field Blanks**

Sample EB-06-10/28/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08102956**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 29, 2008  
**LDC Report Date:** December 5, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08103002

**Sample Identification**

MW-14-5\*\*  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1\*\*  
DUPE-05-4Q08  
EB-07-10/29/08  
MW-14-4MS  
MW-14-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### IX. Field Duplicates

Samples MW-14-3 and DUPE-05-4Q08 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-14-3	DUPE-05-4Q08	
Perchlorate	4.48	4.59	2

### X. Field Blanks

Sample EB-07-10/29/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL  
Perchlorate - Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

**NASA JPL  
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08103002**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 30, 2008  
**LDC Report Date:** December 5, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08103106

**Sample Identification**

MW-22-5  
MW-22-4\*\*  
MW-22-3  
MW-22-2  
MW-22-1  
DUPE-06-4Q08  
EB-08-10/30/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.



### IX. Field Duplicates

Samples MW-22-2 and DUPE-06-4Q08 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-22-2	DUPE-06-4Q08	
Perchlorate	1.95	1.93	1

### X. Field Blanks

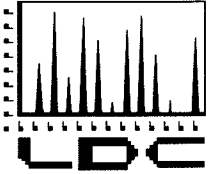
Sample EB-08-10/30/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08103106**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 16, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on December 3, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19898:**

**SDG #**

**Fraction**

BMI08110403, BMI08110554, Volatiles, Chromium, Wet Chemistry  
BMI08110621, BMI08110758

The data validation was performed under EPA Level III and Level IV 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, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 31 through November 3, 2008  
**LDC Report Date:** December 15, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08110403

**Sample Identification**

MW-4-5  
MW-4-4\*\*  
MW-4-3  
MW-4-2  
MW-4-1  
EB-09-10/31/08  
TB-09-10/31/08  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2  
MW-12-1  
EB-10-11/3/08  
TB-10-11/3/08  
MW-4-4MS  
MW-4-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 16 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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.

## **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**

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.

### **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**

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XII. Compound Quantitation and CRQLs**

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XIII. Tentatively Identified Compounds (TICs)**

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XIV. System Performance**

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

### **XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.



## **XVII. Field Blanks**

Samples TB-09-10/31/08 and TB-10-11/3/08 were identified as trip blanks. No volatile contaminants were found in these blanks.

Samples EB-09-10/31/08 and EB-10-11/3/08 were identified as equipment blanks. No volatile contaminants were found in these blanks.

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08110403**

No Sample Data Qualified in this SDG

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08110403**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 4, 2008  
**LDC Report Date:** December 15, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08110554

**Sample Identification**

MW-11-5  
MW-11-4  
MW-11-3  
MW-11-2  
MW-11-1  
DUPE-07-4Q08  
EB-11-11/4/08  
TB-11-11/4/08  
MW-11-1MS  
MW-11-1MSD

## Introduction

This data review covers 10 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.

## **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**

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)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-11-1MS/MSD (MW-11-1)	tert-Butylbenzene	-	-	20.3 ( $\leq 20$ )	J (all detects) UJ (all non-detects)	A

### 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 are summarized at the end of this report if data has been qualified.

### XVI. Field Duplicates

Samples MW-11-4 and DUPE-07-4Q08 were identified as field duplicates. No volatile contaminants were found in any of the samples.

## **XVII. Field Blanks**

Sample TB-11-11/4/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-11-11/4/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08110554**

<b>SDG</b>	<b>Sample</b>	<b>Compound</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI08110554	MW-11-1	tert-Butylbenzene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08110554**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2008  
**LDC Report Date:** December 15, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08110621

**Sample Identification**

MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
MW-24-1  
DUPE-08-4Q08  
EB-12-11/5/08  
TB-12-11/5/08

## 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.

## **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**

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.

## **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 are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

Samples MW-24-3 and DUPE-08-4Q08 were identified as field duplicates. No volatile contaminants were found in any of the samples.

## **XVII. Field Blanks**

Sample TB-12-11/5/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-12-11/5/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**

**Volatiles - Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

**NASA JPL**

**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2008  
**LDC Report Date:** December 15, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08110758

**Sample Identification**

MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1  
EB-13-11/06/08  
TB-13-11/06/08

## Introduction

This data review covers 7 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. 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.

## **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**

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.



### **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 are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

### **XVII. Field Blanks**

Sample TB-13-11/06/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-13-11/06/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 31 through November 3, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08110403

**Sample Identification**

MW-4-5  
MW-4-4\*\*  
MW-4-3  
MW-4-2  
MW-4-1  
EB-09-10/31/08  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2  
MW-12-1  
EB-10-11/3/08

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Samples EB-09-10/31/08 and EB-10-11/3/08 were identified as equipment blanks. No chromium was found in these blanks.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08110403**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08110403**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 4, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08110554

**Sample Identification**

MW-11-5  
MW-11-4  
MW-11-3  
MW-11-2  
MW-11-1  
DUPE-07-4208  
EB-11-11/4/08  
MW-11-1MS  
MW-11-1MSD



## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-11-4 and DUPE-07-4208 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Sample EB-11-11/4/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08110554**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08110554**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08110621

**Sample Identification**

MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
MW-24-1  
DUPE-08-4Q08  
EB-12-11/5/08

## Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

Samples MW-24-3 and DUPE-08-4Q08 were identified as field duplicates. No chromium was detected in any of the samples.

## **XIV. Field Blanks**

Sample EB-12-11/5/08 was identified as an equipment blank. No chromium was found in this blank.



**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08110758

**Sample Identification**

MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1  
EB-13-11/06/08

## Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **V. Matrix Spike Analysis**

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.

## **VI. Duplicate Sample Analysis**

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

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Sample EB-13-11/06/08 was identified as an equipment blank. No chromium was found in this blank.

**NASA JPL  
Chromium - Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG

**NASA JPL  
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** October 31 through November 3, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08110403

**Sample Identification**

MW-4-5  
MW-4-4\*\*  
MW-4-3  
MW-4-2  
MW-4-1  
EB-09-10/31/08  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2  
MW-12-1  
EB-10-11/3/08  
MW-4-4MS  
MW-4-4MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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



## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. Calibration

### a. Initial Calibration

All criteria for the initial calibration were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## IV. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-4-4MS/MSD (All samples in SDG BMI08110403)	Perchlorate	79 (80-120)	-	-	J (all detects) UJ (all non-detects)	A

## V. Duplicates

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

## VI. Laboratory Control Samples

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Samples EB-09-10/31/08 and EB-10-11/3/08 were identified as equipment blanks. No perchlorate was found in these blanks.

**NASA JPL  
Perchlorate - Data Qualification Summary - SDG BMI08110403**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI08110403	MW-4-5 MW-4-4** MW-4-3 MW-4-2 MW-4-1 EB-09-10/31/08 MW-12-5 MW-12-4 MW-12-3 MW-12-2 MW-12-1 EB-10-11/3/08	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

**NASA JPL  
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08110403**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 4, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.

**Sample Delivery Group (SDG):** BMI08110554

**Sample Identification**

MW-11-5  
MW-11-4  
MW-11-3  
MW-11-2  
MW-11-1  
DUPE-07-4208  
EB-11-11/4/08  
MW-11-1MS  
MW-11-1MSD

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. Calibration

### a. Initial Calibration

All criteria for the initial calibration were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

## IV. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-11-1MS/MSD (MW-11-1)	Orthophosphate as phosphorus	-	127 (80-120)	13.9 ( $\leq 10$ )	J (all detects) UJ (all non-detects)	A
MW-4-4 (All samples in SDG BMI08110554)	Perchlorate	79 (80-120)	-	-	J (all detects) UJ (all non-detects)	A

## V. Duplicates

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

## VI. Laboratory Control Samples

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

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, and Orthophosphate as Phosphate, and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Chloride	89 (90-110)	MW-11-1	J (all detects) UJ (all non-detects)	P

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

### IX. Field Duplicates

Samples MW-11-4 and DUPE-07-4208 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

### X. Field Blanks

Sample EB-11-11/4/08 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG BMI08110554**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI0811554	MW-11-1	Orthophosphate as phosphorus	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)(RPD)
BMI0811554	MW-11-5 MW-11-4 MW-11-3 MW-11-2 MW-11-1 DUPE-07-4208 EB-11-11/4/08	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
BMI0811554	MW-11-1	Chloride	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI08110554**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08110621

**Sample Identification**

MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
MW-24-1  
DUPE-08-4Q08  
EB-12-11/5/08  
MW-24-1MS  
MW-24-1MSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

Samples MW-24-3 and DUPE-08-4Q08 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## **X. Field Blanks**

Sample EB-12-11/5/08 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI08110621**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.

**Sample Delivery Group (SDG):** BMI08110758

**Sample Identification**

MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1  
EB-13-11/06/08  
MW-25-1MS  
MW-25-1MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.



## **X. Field Blanks**

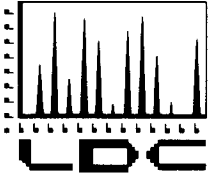
Sample EB-13-11/06/08 was identified as an equipment blank. No perchlorate was found in this blank.

**NASA JPL  
Perchlorate - Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG

**NASA JPL  
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08110758**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 11, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on December 8, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19902:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P0803815	Hexavalent Chromium

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 Inorganic Data Review, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14, 2008  
**LDC Report Date:** December 10, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services  
**Sample Delivery Group (SDG):** P0803815

**Sample Identification**

MW-5  
MW-6  
MW-5MS  
MW-5MSD

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

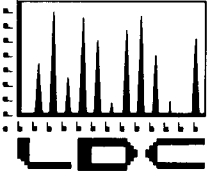


**NASA JPL  
Hexavalent Chromium - Data Qualification Summary - SDG P0803815**

No Sample Data Qualified in this SDG

**NASA JPL  
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG  
P0803815**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 19, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on December 12, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19937:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
BMI08111956	Volatiles, Metals, 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, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 18, 2008  
**LDC Report Date:** December 19, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111956

**Sample Identification**

MW-20-5RS  
MW-20-4RS  
MW-20-3RS  
MW-20-2RS  
MW-20-1RS  
EB-16-11/18/08  
TB-21-11/18/08  
MW-20-5RSMS  
MW-20-5RSMSD

## Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.

## **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**

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.

### **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 are summarized at the end of this report if data has been qualified.

### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

### **XVII. Field Blanks**

Sample TB-21-11/18/08 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-16-11/18/08 was identified as an equipment blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08111956**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111956**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 18, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Metals  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111956

**Sample Identification**

MW-20-5RS  
MW-20-4RS  
MW-20-3RS  
MW-20-2RS  
MW-20-1RS  
EB-16-11/18/08

## Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Metals. The metals analyzed were Calcium, Chromium, Iron, Magnesium, Potassium, and Sodium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/21/08	CCV (4:21)	Sodium Magnesium	86 (90-110) 86 (90-110)	MW-20-5RS MW-20-3RS MW-20-2RS MW-20-1RS	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## V. Matrix Spike Analysis

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.

## VI. Duplicate Sample Analysis

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

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Sample EB-16-11/18/08 was identified as an equipment blank. No metal contaminants were found in this blank.

**NASA JPL  
Metals - Data Qualification Summary - SDG BMI08111956**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI08111956	MW-20-5RS MW-20-3RS MW-20-2RS MW-20-1RS	Sodium  Magnesium	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Calibration verification (%D)

**NASA JPL  
Metals - Laboratory Blank Data Qualification Summary - SDG BMI08111956**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 18, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111956

**Sample Identification**

MW-20-5RS  
MW-20-4RS  
MW-20-3RS  
MW-20-2RS  
MW-20-1RS  
EB-16-11/18/08  
MW-20-5RSMS  
MW-20-5RSMSD  
MW-20-5RSDUP  
MW-20-2RSMS  
MW-20-2RSMSD  
MW-20-1RSMS  
MW-20-1RSMSD  
MW-20-1RSDUP

## Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Iron, EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, and Sulfate, EPA Method 314.0 for Perchlorate, EPA Method 350.0 for Ammonia as Nitrogen, Standard Method 2320B for Alkalinity, Standard Method 2540C for Total Dissolved Solids, Standard Method 3500FeD for Ferrous Iron and Ferric Iron, Standard Method 4500-SD for Sulfide, and Standard Method 5310C for Total Organic Carbon and Total Dissolved Solids.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. Calibration

### a. Initial Calibration

All criteria for the initial calibration were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/21/08	ICV	Ammonia as nitrogen	112 (90-110)	MW-20-5RS MW-20-4RS MW-20-3RS MW-20-2RS MW-20-1RS	J (all detects)	P

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:



Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG BMI08111956	Alkalinity	No LCS analysis associated with these samples. (A pH buffer solution was used as an LCS)	LCS analysis required.	None	P

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

### IX. Field Duplicates

No field duplicates were identified in this SDG.

### X. Field Blanks

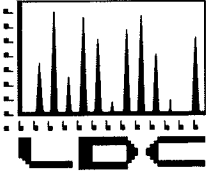
Sample EB-16-11/18/08 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG BMI08111956**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI08111956	MW-20-5RS MW-20-4RS MW-20-3RS MW-20-2RS MW-20-1RS	Ammonia as nitrogen	J (all detects)	P	Calibration verification (%D)
BMI08111956	MW-20-5RS MW-20-4RS MW-20-3RS MW-20-2RS MW-20-1RS EB-16-11/18/08	Alkalinity	None	P	Laboratory control samples

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI08111956**

No Sample Data Qualified in this SDG



**LABORATORY DATA CONSULTANTS, INC.**

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

Battelle  
505 King Avenue  
Room 10-1-170  
Columbus, OH 43201  
ATTN: Ms. Betsy Cutie

December 19, 2008

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 12, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19941:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
BMI08111104, BMI08111255, BMI08111304, BMI08111425, BMI08111803	Volatiles, Metals, Wet Chemistry

The data validation was performed under EPA Level III and Level IV 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, October 2004
- 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; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7 through November 10, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08111104

**Sample Identification**

MW-26-2  
MW-26-1  
EB-14-11/07/08  
TB-14-11/07/08  
MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2  
MW-23-1  
EB-15-11/10/08  
TB-15-11/10/08  
MW-26-2MS  
MW-26-2MSD

## Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

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

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Flag	A or P
11/17/08	Bromomethane 2,2-Dichloropropane 1,2-Dibromo-3-chloropropane	36.3 32.1 30.5	All samples in SDG BMI08111104	J (all detects) UJ (all non-detects)	P

## V. Blanks

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

## VI. Surrogate Spikes

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

## VII. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-26-2MS/MSD (MW-26-2)	Bromomethane 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene	- - -	- - -	29 ( $\leq 20$ ) 23.4 ( $\leq 20$ ) 26.0 ( $\leq 20$ )	J (all detects) UJ (all non-detects)	A

## VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS MS15W1117L5	Bromomethane 2,2-Dichloropropane	64 (70-130) 68 (70-130)	All samples in SDG BMI08111104	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

## 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 are summarized at the end of this report if data has been qualified.

#### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

#### **XVII. Field Blanks**

Samples TB-14-11/07/08 and TB-15-11/10/08 were identified as trip blanks. No volatile contaminants were found in these blanks.

Samples EB-14-11/07/08 and EB-15-11/10/08 were identified as equipment blanks. No volatile contaminants were found in these blanks with the following exceptions:

<b>Equipment Blank ID</b>	<b>Compound</b>	<b>Concentration (ug/L)</b>
EB-15-11/10/08	Chloroform	0.67

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08111104**

SDG	Sample	Compound	Flag	A or P	Reason
BMI08111104	MW-26-2 MW-26-1 EB-14-11/07/08 TB-14-11/07/08 MW-23-5 MW-23-4 MW-23-3 MW-23-2 MW-23-1 EB-15-11/10/08 TB-15-11/10/08	Bromomethane 2,2-Dichloropropane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI08111104	MW-26-2	Bromomethane 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI08111104	MW-26-2 MW-26-1 EB-14-11/07/08 TB-14-11/07/08 MW-23-5 MW-23-4 MW-23-3 MW-23-2 MW-23-1 EB-15-11/10/08 TB-15-11/10/08	Bromomethane 2,2-Dichloropropane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111104**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 11, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08111255

**Sample Identification**

MW-7  
MW-16  
TB-16-11/11/08

## Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. 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.

## **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**

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

## **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 are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Sample TB-16-11/11/08 was identified as a trip blank. No volatile contaminants were found in this blank.

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08111255**

No Sample Data Qualified in this SDG

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111255**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.

**Sample Delivery Group (SDG):** BMI08111304

**Sample Identification**

MW-10  
MW-15  
TB-17-11/12/08



## Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Flag	A or P
11/17/08	Bromomethane	42.0	All samples in SDG BMI08111304	J (all detects) UJ (all non-detects)	P

## V. Blanks

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

## VI. Surrogate Spikes

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

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

## VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS MS15W0117K5	Bromomethane	58 (70-130)	All samples in SDG BMI08111304	J (all detects) UJ (all non-detects)	P

## 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 are summarized at the end of this report if data has been qualified.

## XVI. Field Duplicates

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Sample TB-17-11/12/08 was identified as a trip blank. No volatile contaminants were found in this blank.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08111304**

SDG	Sample	Compound	Flag	A or P	Reason
BMI08111304	MW-10 MW-15 TB-17-11/12/08	Bromomethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI08111304	MW-10 MW-15 TB-17-11/12/08	Bromomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111304**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111425

**Sample Identification**

MW-13  
MW-8  
TB-18-11/13/08

## Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Flag	A or P
11/18/08	Bromomethane	43.9	All samples in SDG BMI08111425	J (all detects) UJ (all non-detects)	P

## V. Blanks

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

## VI. Surrogate Spikes

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



## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

## VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS MS15W1118K5	Bromomethane	56 (70-130)	All samples in SDG BMI08111425	J (all detects) UJ (all non-detects)	P

## 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 are summarized at the end of this report if data has been qualified.

## XVI. Field Duplicates

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Sample TB-18-11/13/08 was identified as a trip blank. No volatile contaminants were found in this blank.

**NASA JPL  
Volatiles - Data Qualification Summary - SDG BMI08111425**

<b>SDG</b>	<b>Sample</b>	<b>Compound</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI08111425	MW-13 MW-8 TB-18-11/13/08	Bromomethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI08111425	MW-13 MW-8 TB-18-11/13/08	Bromomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111425**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14 through November 17, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111803

**Sample Identification**

MW-5  
MW-6  
TB-19-11/14/08  
MW-01\*\*  
MW-09  
TB-20-11/17/08  
MW-01MS  
MW-01MSD

\*\*Indicates sample underwent EPA Level IV review

## 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 qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

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

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

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Flag	A or P
11/20/08	2,2-Dichloropropane	32.6	All samples in SDG BMI08111803	J (all detects) UJ (all non-detects)	P

## V. Blanks

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

## VI. Surrogate Spikes

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

## VII. Matrix Spike/Matrix Spike Duplicates

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.

## VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS MS15W1120L5	2,2-Dichloropropane	67 (70-130)	All samples in SDG BMI08111803	J (all detects) UJ (all non-detects)	P

## 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

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## XIV. System Performance

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Samples TB-19-11/14/08 and TB-20-11/17/08 were identified as trip blanks. No volatile contaminants were found in these blanks.



**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG BMI08111803**

SDG	Sample	Compound	Flag	A or P	Reason
BMI08111803	MW-5 MW-6 TB-19-11/14/08 MW-01** MW-09 TB-20-11/17/08	2,2-Dichloropropane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI08111803	MW-5 MW-6 TB-19-11/14/08 MW-01** MW-09 TB-20-11/17/08	2,2-Dichloropropane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI08111803**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7 through November 10, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111104

**Sample Identification**

MW-26-2  
MW-26-1  
EB-14-11/07/08  
MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2  
MW-23-1  
EB-15-11/10/08  
MW-26-2MS  
MW-26-2MSD

## Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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 sample analyses were reviewed for each matrix as applicable.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

Samples EB-14-11/07/08 and EB-15-11/10/08 were identified as equipment blanks. No chromium was found in these blanks.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI08111104**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08111104**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 11, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111255

**Sample Identification**

MW-7  
MW-16

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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 sample analyses were reviewed for each matrix as applicable.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI0811255**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI0811255**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111304

**Sample Identification**

MW-10  
MW-15

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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 sample analyses were reviewed for each matrix as applicable.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI08111304**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08111304**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111425

**Sample Identification**

MW-13  
MW-8

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or 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.
  - UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
  - A Indicates the finding is based upon technical validation criteria.
  - P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **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 sample analyses were reviewed for each matrix as applicable.

## **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**

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 performed for this SDG.

## **XI. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI08111425**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08111425**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14 through November 17, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical, Inc.  
**Sample Delivery Group (SDG):** BMI08111803

**Sample Identification**

MW-5  
MW-6  
MW-01\*\*  
MW-09

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is 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. No chromium was found in the initial, continuing and preparation blanks.

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

The frequency of analysis was met.

The criteria for analysis were met.

## **V. Matrix Spike Analysis**

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.

## **VI. Duplicate Sample Analysis**

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

## **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**

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.



## **IX. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **X. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XI. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **XII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **XIII. Field Duplicates**

No field duplicates were identified in this SDG.

## **XIV. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG BMI08111803**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG BMI08111803**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7 through November 10, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08111104

**Sample Identification**

MW-26-2  
MW-26-1  
EB-14-11/07/08  
MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2  
MW-23-1  
EB-15-11/10/08  
MW-26-2MS  
MW-26-2MSD

## Introduction

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

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Samples EB-14-11/07/08 and EB-15-11/10/08 were identified as equipment blanks. No perchlorate was found in these blanks.

**NASA JPL  
Perchlorate - Data Qualification Summary - SDG BMI08111104**

No Sample Data Qualified in this SDG

**NASA JPL  
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08111104**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 11, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.

**Sample Delivery Group (SDG):** BMI08111255

**Sample Identification**

MW-7  
MW-16  
MW-7MS  
MW-7MSD



## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. Calibration

### a. Initial Calibration

All criteria for the initial calibration were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

## IV. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-7MS/MSD (All samples in SDG BMI08111255)	Orthophosphate as P	133 (80-120)	139 (80-120)	-	J (all detects)	A

## V. Duplicates

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

## VI. Laboratory Control Samples

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

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

### **IX. Field Duplicates**

No field duplicates were identified in this SDG.

### **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG BMI0811255**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
BMI0811255	MW-7 MW-16	Orthophosphate as P	J (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI0811255**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08111304

**Sample Identification**

MW-10  
MW-15

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.



**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08111304**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08111304**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08111425

**Sample Identification**

MW-13  
MW-8  
MW-13MS  
MW-13MSD

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG BMI08111425**

No Sample Data Qualified in this SDG

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI08111425**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14 through November 17, 2008  
**LDC Report Date:** December 18, 2008  
**Matrix:** Water  
**Parameters:** Perchlorate  
**Validation Level:** EPA Level III & IV  
**Laboratory:** Alpha Analytical Services, Inc.  
**Sample Delivery Group (SDG):** BMI08111803

**Sample Identification**

MW-5  
MW-6  
MW-01\*\*  
MW-09  
MW-01MS  
MW-01MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

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

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. 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 or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

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



## **I. Technical Holding Times**

All technical holding time requirements were met.

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

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration Verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

## **IV. Matrix Spike/Matrix Spike Duplicates**

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

## **V. Duplicates**

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

## **VI. Laboratory Control Samples**

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

## **VII. Sample Result Verification**

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

## **VIII. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**NASA JPL**  
**Perchlorate - Data Qualification Summary - SDG BMI08111803**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI08111803**

No Sample Data Qualified in this SDG