

## **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 contractor, 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 fourth quarter 2012 groundwater monitoring event were acceptable for their intended use of characterizing aquifer quality.

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

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Field and laboratory QC samples were collected and analyzed to fulfill quality requirements. Proper sample collection and handling procedures were utilized to ensure the integrity of the analytical results. A comprehensive quality assurance and quality control (QA/QC) plan for groundwater monitoring is described in the *Work Plan for Performing a Remedial Investigation/Feasibility Study* (Ebasco, 1993).

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

The field QA/QC samples collected for JPL groundwater monitoring included field duplicate samples, equipment rinsate blanks and trip blanks. The QC sample results were used for the qualitative evaluation of the data. Table 1-1 summarizes analytical results for the field quality control samples during the fourth quarter 2012 groundwater monitoring event.

**Field Duplicate Samples.** Duplicate samples were collected to evaluate the precision of the sample collection process. Duplicate samples for volatile organic compounds (VOCs), perchlorate, total chromium and hexavalent chromium [Cr(VI)] analyses were collected from monitoring wells MW-6, MW-8, MW-11 (Screen 3), MW-13, MW-15, MW-19 (Screen 3), MW-24 (Screen 2) and MW-26 (Screen 1). The analytical results for the field 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 the samples due to inadequate decontamination. O-xylene was detected at a concentration below the reporting limit (0.16J  $\mu\text{g/L}$ ) in the equipment blank collected on November 6, 2012. The source of the contamination could not be determined. No other VOC contaminants or TICs were detected in the equipment blanks as shown in Table 1-1.

**Trip Blanks.** Trip blanks, which consisted of reagent-grade water in vials 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 or TICs were detected in the trip blanks as shown in Table 1-1.

**Source Blank.** A source blank which consisted of distilled water used by sampling personnel for equipment decontamination was collected during this sampling event. This QC sample serves as a check for any contamination present in the source water. Ethylbenzene, o-xylene, m,p-xylene were detected at a concentrations below the reporting limits (0.10J  $\mu\text{g/L}$ , 0.22J  $\mu\text{g/L}$  and 0.37J  $\mu\text{g/L}$ , respectively) in the source blank collected on November 6, 2012. The source of the contamination could not be determined. No other VOC contaminants or TICs were detected in the source blank as shown in Table 1-1.

## 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.* 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 to determine the compliance with established method performance criteria. 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 contractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, CA. All of the data provided by BC Laboratories, Inc., of Bakersfield, California 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 National Functional Guidelines for Organic and Inorganic Data Review (U.S. EPA, 2008; 2010).

*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. Data validation indicated that all of the data from the fourth quarter 2012 groundwater monitoring event were acceptable for their intended use of characterizing aquifer quality.

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. 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June.
- U.S. EPA. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. January.

**TABLE 1-1**  
**SUMMARY OF CONTAMINANTS DETECTED IN QUALITY CONTROL SAMPLES**  
**COLLECTED DURING THE NOV 2012 SAMPLING EVENT**

(All concentrations reported in µg/L.)

Blank Type	Sample ID Number	Sampling Location(s)	Total Chromium	Methylene Chloride	1,2,3-Trichloropropane	2-Butanone	Other Organic Compounds		TICs	
EQUIPMENT BLANK	EB-1-110512	MW-19, MW-20	3 U	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-2-110612	MW-14, MW-19	3 U	0.5 U	1 U	10 U	<b>o-Xylene</b>	<b>0.16 J</b>		
EQUIPMENT BLANK	EB-3-110712	MW-17, MW-18	3 U	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-4-110812	MW-4-, MW-22	<b>0.72 J</b>	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-5-110912	MW-25, MW-26	3 U	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-6-111212	MW-3, MW-12	3 U	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-7-111312	MW-23, MW-24	3 U	0.5 U	1 U	10 U				
EQUIPMENT BLANK	EB-8-111412	MW-11, MW-21	3 U	0.5 U	1 U	10 U				
SOURCE BLANK	SB-1-110612	-	NA	0.5 U	1 U	10 U	<b>Ethylbenzene</b>	<b>0.1 J</b>		
							<b>o-Xylene</b>	<b>0.22 J</b>		
							<b>m,p-Xylene</b>	<b>0.37 J</b>		
SOURCE BLANK	SB-2-111212	-	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-10-111612	MW-1, MW-8, MW-13, MW-16	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-1-110512	MW-19, MW-20	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-2-110612	MW-14, MW-19	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-3-110712	MW-17, MW-18	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-4-110812	MW-4, MW-22	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-5-110912	MW-25, MW-26	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-6-111212	MW-3, MW-12	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-7-111312	MW-23, MW-24	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-8-111412	MW-11, MW-21	NA	0.5 U	1 U	10 U				
TRIP BLANK	TB-9-111512	MW-5, MW-6, MW-7, MW-9, MW-10, MW-15	NA	0.5 U	1 U	10 U				

**Notes**

NA Not Analyzed  
J Analyte concentration is an estimated value  
U Analyte was analyzed for but not detected at or above the stated limit

## **ATTACHMENT 2: DATA VALIDATION REPORTS**

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This attachment contains the data validation reports performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California.



## Laboratory Data Consultants, Inc.

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

December 26, 2012

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 7, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 28889:**

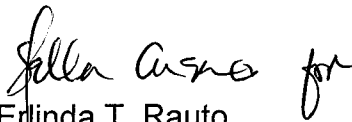
<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
1221405 & 1221549	Volatiles, Chromium, Wet Chemistry

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- 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, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221405

### Sample Identification

TB-2-110612  
SB-1-110612  
EB-2-10612  
MW-19-3  
DUPE-1-4Q12  
MW-19-2\*\*  
MW-19-1  
MW-14-5  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1

\*\*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 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990.

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/13/12	Bromomethane	63.2	TB-2-110612 SB-1-110612	J (all detects) UJ (all non-detects)	P
	Methyl iodide	48.2	EB-2-10612 MW-19-3 DUPE-1-4Q12 MW-19-2** MW-19-1 MW-14-5 MW-14-4 BVK0837-MB	J (all detects) UJ (all non-detects)	
11/13/12	Bromomethane	40.4	MW-14-3 MW-14-2	J (all detects) UJ (all non-detects)	P
	Methyl iodide	40.5	MW-14-1 BVK0839-MB	J (all detects) UJ (all non-detects)	

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1221405	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

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Internal Standards

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

## XI. Target Compound Identifications

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 EPA Level III criteria.

## XII. Compound Quantitation and RLs

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

### XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-19-3 and DUPE-1-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-19-3	DUPE-1-4Q12	
Chloroform	0.15	0.12U	200
Tetrachloroethene	0.33	0.27	20

### XVII. Field Blanks

Sample TB-2-110612 was identified as a trip blank. No volatile contaminants were found.

Sample EB-2-10612 was identified as an equipment blank. No volatile contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/L)
EB-2-10612	o-Xylene	0.16

Sample SB-1-110612 was identified as a source blank. No volatile contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/L)
SB-1-110612	Ethylbenzene m,p-Xylenes o-Xylene	0.10 0.37 0.22

**NASA JPL  
Volatiles - Data Qualification Summary - SDG 1221405**

SDG	Sample	Compound	Flag	A or P	Reason
1221405	TB-2-110612 SB-1-110612 EB-2-10612 MW-19-3 DUPE-1-4Q12 MW-19-2** MW-19-1 MW-14-5 MW-14-4 MW-14-3 MW-14-2 MW-14-1	Bromomethane  Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1221405	TB-2-110612 SB-1-110612 EB-2-10612 MW-19-3 DUPE-1-4Q12 MW-19-2** MW-19-1 MW-14-5 MW-14-4 MW-14-3 MW-14-2 MW-14-1	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG 1221405**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2012  
**LDC Report Date:** December 12, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221405

**Sample Identification**

EB-2-10612  
MW-19-3  
DUPE-1-4Q12  
MW-19-2\*\*  
MW-19-1  
MW-14-5  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1  
EB-2-10612MS  
EB-2-10612MSD  
EB-2-10612DUP

\*\*Indicates sample underwent EPA Level IV review



## 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 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

## **III. Calibration**

An initial calibration was performed.

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

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

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

## **VIII. Laboratory Control Samples (LCS)**

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

## **IX. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

## XII. 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 EPA Level III criteria.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples MW-19-3 and DUPE-1-4Q12 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-19-3	DUPE-1-4Q12	
Chromium	2.4	2.9	19

## XV. Field Blanks

Sample EB-2-10612 was identified as an equipment blank. No chromium was found.

**NASA JPL  
Metals - Data Qualification Summary - SDG 1221405**

No Sample Data Qualified in this SDG

**NASA JPL  
Metals - Laboratory Blank Data Qualification Summary - SDG 1221405**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 6, 2012  
**LDC Report Date:** December 26, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221405

**Sample Identification**

EB-2-10612  
MW-19-3  
DUPE-1-4Q12  
MW-19-2\*\*  
MW-19-1  
MW-14-5  
MW-14-4  
MW-14-3  
MW-14-2  
MW-14-1  
EB-2-10612MS  
EB-2-10612MSD  
EB-2-10612DUP

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EP Method 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## X. Field Duplicates

Samples MW-19-3 and DUPE-1-4Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-19-3	DUPE-1-4Q12	
Hexavalent chromium	0.0023 mg/L	0.0025 mg/L	8
Perchlorate	1.8 ug/L	0.81U ug/L	200

## XI. Field Blanks

Sample EB-2-10612 was identified as an equipment blank. No contaminant concentrations were found.



**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG 1221405**

No Sample Data Qualified in this SDG

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1221405**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221549

### Sample Identification

TB-3-110712  
EB-3-110712  
MW-18-5  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
MW-17-3MS  
MW-17-3MSD

\*\*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 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA Level III criteria since this review is based on QC data.

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- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990.

### IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/13/12	Bromomethane Methyl iodide	63.2 48.2	All samples in SDG 1221549	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1221549	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.

## **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 EPA Level III criteria.

## **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

#### **XIV. System Performance**

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-3-110712 was identified as a trip blank. No volatile contaminants were found.

Sample EB-3-110712 was identified as an equipment blank. No volatile contaminants were found.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 1221549**

SDG	Sample	Compound	Flag	A or P	Reason
1221549	TB-3-110712 EB-3-110712 MW-18-5 MW-18-4 MW-18-3 MW-18-2 MW-18-1** MW-17-5 MW-17-4 MW-17-3 MW-17-2 MW-17-1	Bromomethane  Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1221549	TB-3-110712 EB-3-110712 MW-18-5 MW-18-4 MW-18-3 MW-18-2 MW-18-1** MW-17-5 MW-17-4 MW-17-3 MW-17-2 MW-17-1	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 1221549**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7, 2012  
**LDC Report Date:** December 13, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221549

### Sample Identification

EB-3-110712  
MW-18-5  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
MW-17-3MS  
MW-17-3MSD  
MW-17-3DUP

\*\*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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XII. 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 EPA Level III criteria.

## **XIII. Overall Assessment of Data**

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

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample EB-3-110712 was identified as an equipment blank. No chromium was found.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 1221549**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 1221549**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 7, 2012  
**LDC Report Date:** December 13, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221549

**Sample Identification**

EB-3-110712  
MW-18-5  
MW-18-4  
MW-18-3  
MW-18-2  
MW-18-1\*\*  
MW-17-5  
MW-17-4  
MW-17-3  
MW-17-2  
MW-17-1  
MW-17-3MS  
MW-17-3MSD  
MW-17-3DUP

\*\*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 and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration

All criteria for the initial calibration of each method were met.

## III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Hexavalent chromium	0.0014140 mg/L	MW-18-5 MW-18-4

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-18-4	Hexavalent chromium	0.0018 mg/L	0.0018U mg/L

## V. 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.

## VI. Duplicates

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Field Blanks**

Sample EB-3-110712 was identified as an equipment blank. No contaminant concentrations were found.



**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG 1221549**

No Sample Data Qualified in this SDG

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1221549**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Modified Final Concentration</b>	<b>A or P</b>
1221549	MW-18-4	Hexavalent chromium	0.0018U mg/L	A



## Laboratory Data Consultants, Inc.

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

January 4, 2013

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 17, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 28941:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
1221765 1221814	Volatiles
1221961 1222079	Chromium
1222208	Wet Chemistry

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- 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 #28941 (Battelle-San Diego / NASA JPL)

90/10 (client select)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		CLO <sub>4</sub> (314.0)		CrVI (7196)		W		S		W		S		W		S		W		S			
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	1221765	12/17/12	01/10/13	13	0	11	0	11	0	11	0	11	0																
A	1221765	12/17/12	01/10/13	0	0	0	0	1	0	1	0	0																	
B	1221814	12/17/12	01/10/13	16	0	13	0	16	0	16	0	16	0																
B	1221814	12/17/12	01/10/13	0	0	0	0	1	0	1	0	0																	
C	1221961	12/17/12	01/10/13	14	0	11	0	17	0	17	0	17	0																
C	1221961	12/17/12	01/10/13	0	0	0	0	1	0	1	0	0																	
D	1222079	12/17/12	01/10/13	16	0	17	0	17	0	17	0	17	0																
D	1222079	12/17/12	01/10/13	0	0	0	0	1	0	1	0	0																	
E	1222208	12/17/12	01/10/13	10	0	10	0	10	0	10	0	10	0																
E	1222208	12/17/12	01/10/13	0	0	0	0	1	0	1	0	0																	
					</																								

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 9, 2012  
**LDC Report Date:** January 3, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221765

**Sample Identification**

TB-5-110912  
EB-5-110912  
MW-26-2  
MW-26-1  
DUPE-2-4Q12  
MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1\*\*  
MW-25-4MS  
MW-25-4MSD  
MW-25-1MS  
MW-25-1MSD

\*\*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 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/14/12 (CCV-14NOV02)	Bromomethane	32.2	All samples in SDG 1221765	J (all detects) UJ (all non-detects)	P
11/14/12 (CCV-14NOV03)	Methyl iodide Pentachloroethane	30.8 34.9	All samples in SDG 1221765	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1221765	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.

## **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 EPA Level III criteria.

## **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

#### XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-26-1 and DUPE-2-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-26-1	DUPE-2-4Q12	
Bromodichloromethane	0.16	0.14	13
Chloroform	0.39	0.32	20
1,1-Dichloroethane	0.11	0.11U	200
Tetrachloroethene	0.79	0.61	26
Trichloroethene	0.33	0.27	20

#### XVII. Field Blanks

Sample TB-5-110912 was identified as a trip blank. No volatile contaminants were found.

Sample EB-5-110912 was identified as an equipment blank. No volatile contaminants were found.



**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 1221765**

SDG	Sample	Compound	Flag	A or P	Reason
1221765	TB-5-110912 EB-5-110912 MW-26-2 MW-26-1 DUPE-2-4Q12 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1**	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1221765	TB-5-110912 EB-5-110912 MW-26-2 MW-26-1 DUPE-2-4Q12 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1**	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 1221765**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 9, 2012  
**LDC Report Date:** December 19, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.

**Sample Delivery Group (SDG):** 1221765

**Sample Identification**

EB-5-110912  
MW-26-2  
MW-26-1  
DUPE-2-4Q12  
MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1\*\*  
MW-25-4MS  
MW-25-4MSD  
MW-25-4DUP

\*\*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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

### **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

### **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

### **XII. 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 EPA Level III criteria.

### **XIII. Overall Assessment of Data**

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

### **XIV. Field Duplicates**

Samples MW-26-1 and DUPE-2-4Q12 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-26-1	DUPE-2-4Q12	
Chromium	0.50U	0.52	200

### **XV. Field Blanks**

Sample EB-5-110912 was identified as an equipment blank. No chromium was found.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 1221765**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 1221765**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 9, 2012  
**LDC Report Date:** December 19, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221765

**Sample Identification**

EB-5-110912  
MW-26-2  
MW-26-1  
DUPE-2-4Q12  
MW-25-5  
MW-25-4  
MW-25-3  
MW-25-2  
MW-25-1\*\*  
MW-25-4MS  
MW-25-4MSD  
MW-25-4DUP

\*\*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 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

Samples MW-26-1 and DUPE-2-4Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## **XI. Field Blanks**

Sample EB-5-110912 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG 1221765**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1221765**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2012  
**LDC Report Date:** January 3, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221814

### Sample Identification

TB-6-111212  
SB-2-111212  
EB-6-111212  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2\*\*  
MW-12-1  
MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
MW-12-2MS  
MW-12-2MSD  
MW-3-1MS  
MW-3-1MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/14/12 (CCV-14NOV02)	Bromomethane	32.2	MW-12-2** MW-12-2MS MW-12-2MSD BVK0985-MB	J (all detects) UJ (all non-detects)	P
11/14/12 (CCV-14NOV03)	Methyl iodide  Pentachloroethane	30.8  34.9	MW-12-2** MW-12-2MS MW-12-2MSD BVK0985-MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
11/14/12 (CCV-14NOV35)	Pentachloroethane	62.6	TB-6-111212 SB-2-111212 EB-6-111212 MW-12-5 MW-12-4 MW-12-3 MW-12-1 MW-3-5 MW-3-4 MW-3-3 MW-3-2 MW-3-1 MW-3-1MS MW-3-1MSD BVK0995-MB	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1221814	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.

## 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 EPA Level III criteria.

## **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

## **XIV. System Performance**

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-6-111212 was identified as a trip blank. No volatile contaminants were found.

Sample EB-6-111212 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-2-111212 was identified as a source blank. No volatile contaminants were found.



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221814

**Sample Identification**

EB-6-111212  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2\*\*  
MW-12-1  
MW-3-5  
MW-3-4  
MW-3-3  
MW-3-1  
MW-3-1MS  
MW-3-1MSD  
MW-3-1DUP  
MW-3-2

\*\*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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

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

## **VIII. Laboratory Control Samples (LCS)**

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

## **IX. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XII. 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 EPA Level III criteria.

## **XIII. Overall Assessment of Data**

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

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample EB-6-111212 was identified as an equipment blank. No chromium was found.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 1221814**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 1221814**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 12, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221814

**Sample Identification**

EB-6-111212  
MW-12-5  
MW-12-4  
MW-12-3  
MW-12-2\*\*  
MW-12-1  
MW-3-5  
MW-3-4  
MW-3-3  
MW-3-2  
MW-3-1  
EB-6-111212MS  
EB-6-111212MSD  
EB-6-111212DUP  
MW-12-2MS  
MW-12-2MSD  
MW-12-2DUP  
MW-3-1MS  
MW-3-1MSD  
MW-3-1DUP

\*\*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 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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



## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Field Blanks**

Sample EB-6-111212 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG 1221814**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1221814**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2012  
**LDC Report Date:** January 3, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221961

### Sample Identification

TB-7-111312  
EB-7-111312  
MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2\*\*  
MW-23-1  
MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
DUPE-3-4Q12  
MW-24-1  
MW-23-2MS  
MW-23-2MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/14/12	Pentachloroethane	62.6	TB-7-111312 EB-7-111312 MW-23-5 MW-23-4 MW-23-2** MW-23-2MS MW-23-2MSD BVK1060-MB	J (all detects) UJ (all non-detects)	P
11/15/12 (CCV-15NOV02)	Bromomethane	30.5	MW-23-3 MW-23-1 MW-24-5 MW-24-4 MW-24-3 MW-24-2 DUPE-3-4Q12 MW-24-1	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
11/15/12 (CCV-15NOV03)	Methyl iodide  Pentachloroethane	36.5  33.4	MW-23-3 MW-23-1 MW-24-5 MW-24-4 MW-24-3 MW-24-2 DUPE-3-4Q12 MW-24-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1221961	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.

## 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 EPA Level III criteria.

## XII. Compound Quantitation and RLs

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

## XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-24-2 and DUPE-3-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-24-2	DUPE-3-4Q12	
Bromodichloromethane	0.20	0.14	35
Carbon tetrachloride	0.41	0.18	78
Chloroform	0.42	0.32	27
1,1-Dichloroethane	0.16	0.11	37
Tetrachloroethene	0.24	0.16	40
Trichloroethene	0.11	0.085U	200

## **XVII. Field Blanks**

Sample TB-7-111312 was identified as a trip blank. No volatile contaminants were found.

Sample EB-7-111312 was identified as an equipment blank. No volatile contaminants were found.



**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 1221961**

SDG	Sample	Compound	Flag	A or P	Reason
1221961	TB-7-111312 EB-7-111312 MW-23-5 MW-23-4 MW-23-2**	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1221961	MW-23-3 MW-23-1 MW-24-5 MW-24-4 MW-24-3 MW-24-2 DUPE-3-4Q12 MW-24-1	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1221961	TB-7-111312 EB-7-111312 MW-23-5 MW-23-4 MW-23-3 MW-23-2** MW-23-1 MW-24-5 MW-24-4 MW-24-3 MW-24-2 DUPE-3-4Q12 MW-24-1	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 1221961**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221961

**Sample Identification**

EB-7-111312  
MW-23-5  
MW-23-4  
MW-23-3  
MW-23-2\*\*  
MW-23-1  
MW-24-5  
MW-24-4  
MW-24-3  
MW-24-2  
DUPE-3-4Q12  
MW-24-1

\*\*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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. 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.

## **VIII. Laboratory Control Samples (LCS)**

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

## **IX. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

## XII. 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 EPA Level III criteria.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples MW-24-2 and DUPE-3-4Q12 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-24-2	DUPE-3-4Q12	
Chromium	3.1	2.7	14

## XV. Field Blanks

Sample EB-7-111312 was identified as an equipment blank. No chromium was found.

**NASA JPL**

**Chromium - Data Qualification Summary - SDG 1221961**

No Sample Data Qualified in this SDG

**NASA JPL**

**Chromium - Laboratory Blank Data Qualification Summary - SDG 1221961**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 13, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1221961

### Sample Identification

EB-7-111312	DUPE-3-4Q12DUP
MW-23-5	MW-24-1MS
MW-23-4	MW-24-1MSD
MW-23-3	MW-24-1DUP
MW-23-2**	
MW-23-1	
MW-24-5	
MW-24-4	
MW-24-3	
MW-24-2	
DUPE-3-4Q12	
MW-24-1	
EB-7-111312MS	
EB-7-111312MSD	
EB-7-111312DUP	
MW-23-2MS	
MW-23-2MSD	
MW-23-2DUP	
DUPE-3-4Q12MS	
DUPE-3-4Q12MSD	

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 24 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## X. Field Duplicates

Samples MW-24-2 and DUPE-3-4Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-24-2	DUPE-3-4Q12	
Hexavalent chromium	0.0024 mg/L	0.0024 mg/L	0
Perchlorate	8.7 ug/L	8.4 ug/L	4

## XI. Field Blanks

Sample EB-7-111312 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL**

**Wet Chemistry - Data Qualification Summary - SDG 1221961**

No Sample Data Qualified in this SDG

**NASA JPL**

**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1221961**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14, 2012  
**LDC Report Date:** January 3, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222079

**Sample Identification**

TB-8-111412  
EB-8-111412  
MW-11-5  
MW-11-4  
MW-11-3  
DUPE-4-4Q12  
MW-11-2  
MW-11-1  
MW-21-5  
MW-21-4  
MW-21-3  
MW-21-2  
MW-21-1\*\*  
MW-11-2MS  
MW-11-2MSD  
MW-21-1MS  
MW-21-1MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/15/12 (CCV-15NOV02)	Bromomethane	30.5	TB-8-111412 EB-8-111412 MW-11-5 MW-11-4 MW-11-3 DUPE-4-4Q12 MW-11-2 MW-11-1 MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-11-2MS MW-11-2MSD BVK1129-MB	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
11/15/12 (CCV-15NOV03)	Methyl iodide Pentachloroethane	36.5 33.4	TB-8-111412 EB-8-111412 MW-11-5 MW-11-4 MW-11-3 DUPE-4-4Q12 MW-11-2 MW-11-1 MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-11-2MS MW-11-2MSD BVK1129-MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
11/15/12 (CCV-15NOV34)	Bromomethane	42.5	MW-21-1** MW-21-1MS MW-21-1MSD BVK1130-MB	J (all detects) UJ (all non-detects)	P
11/15/12 (CCV-15NOV35)	Methyl iodide Pentachloroethane	52.1 64.9	MW-21-1** MW-21-1MS MW-21-1MSD BVK1130-MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1222079	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.

### **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 EPA Level III criteria.

### **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

### **XIV. System Performance**

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-11-3 and DUPE-4-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:



Compound	Concentration (ug/L)		RPD
	MW-11-3	DUPE-4-4Q12	
Methyl-tert-butyl ether	0.24	0.24	0
Styrene	0.19	0.19	0
Toluene	0.11	0.11	0
Trichloroethene	0.090	0.085U	200

## XVII. Field Blanks

Sample TB-8-111412 was identified as a trip blank. No volatile contaminants were found.

Sample EB-8-111412 was identified as an equipment blank. No volatile contaminants were found.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 1222079**

SDG	Sample	Compound	Flag	A or P	Reason
1222079	TB-8-111412 EB-8-111412 MW-11-5 MW-11-4 MW-11-3 DUPE-4-4Q12 MW-11-2 MW-11-1 MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1**	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1222079	TB-8-111412 EB-8-111412 MW-11-5 MW-11-4 MW-11-3 DUPE-4-4Q12 MW-11-2 MW-11-1 MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1**	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 1222079**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222079

**Sample Identification**

EB-8-111412  
MW-11-5  
MW-11-4  
MW-11-3  
DUPE-4-4Q12  
MW-11-2  
MW-11-1  
MW-21-5  
MW-21-4  
MW-21-3  
MW-21-2  
MW-21-1\*\*  
MW-11-2MS  
MW-11-2MSD  
MW-11-2DUP  
MW-21-2MS  
MW-21-2MSD  
MW-21-2DUP

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XII. 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 EPA Level III criteria.

## **XIII. Overall Assessment of Data**

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

## **XIV. Field Duplicates**

Samples MW-11-3 and DUPE-4-4Q12 were identified as field duplicates. No chromium was detected in any of the samples.

## **XV. Field Blanks**

Sample EB-8-111412 was identified as an equipment blank. No chromium was found.

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 14, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222079

**Sample Identification**

EB-8-111412  
MW-11-5  
MW-11-4  
MW-11-3  
DUPE-4-4Q12  
MW-11-2  
MW-11-1  
MW-21-5  
MW-21-4  
MW-21-3  
MW-21-2  
MW-21-1\*\*  
MW-11-2MS  
MW-11-2MSD  
MW-11-2DUP  
MW-21-1MS  
MW-21-1MSD  
MW-21-1DUP

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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 with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
EB-8-111412	Hexavalent chromium	24.75 hours	24 hours	J (all detects) UJ (all non-detects)	P
MW-11-5	Hexavalent chromium	24.25 hours	24 hours	J (all detects) UJ (all non-detects)	P

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

## II. Initial Calibration

All criteria for the initial calibration of each method were met.

## III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## IV. Blanks

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

## V. 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-21-1MS/MSD (MW-21-2 MW-21-1**)	Perchlorate	-	78.1 (80-120)	-	J (all detects) UJ (all non-detects)	A

## VI. Duplicates

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

Samples MW-11-3 and DUPE-4-4Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## **XI. Field Blanks**

Sample EB-8-111412 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG 1222079**

SDG	Sample	Analyte	Flag	A or P	Reason
1222079	EB-8-111412 MW-11-5	Hexavalent chromium	J (all detects) UJ (all non-detects)	P	Technical holding times
1222079	MW-21-2 MW-21-1**	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1222079**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 15, 2012  
**LDC Report Date:** January 3, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222208

**Sample Identification**

TB-9-111512  
MW-6  
DUPE-5-4Q12  
MW-10  
MW-9  
MW-15  
DUPE-6-4Q12  
MW-5\*\*  
MW-7  
MW-7MS  
MW-7MSD

\*\*Indicates sample underwent EPA Level IV review

## 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 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/18/12 (CCV-18NOV02)	Bromomethane	60.0	All samples in SDG 1222208	J (all detects) UJ (all non-detects)	P
11/18/12 (CCV-18NOV03)	Pentachloroethane	46.2	All samples in SDG 1222208	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 1222208	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.

## **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 EPA Level III criteria.

## **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

#### XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-6 and DUPE-5-4Q12 and samples MW-15 and DUPE-6-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-6	DUPE-5-4Q12	
Chloroform	0.72	0.75	4
1,1-Dichloroethane	0.31	0.32	3
1,1-Dichloroethene	0.28	0.30	7
trans-1,2-Dichloroethene	0.19	0.20	5
Tetrachloroethene	1.4	1.4	0
Trichloroethene	3.6	3.5	3

#### XVII. Field Blanks

Sample TB-9-111512 was identified as a trip blank. No volatile contaminants were found.



**NASA JPL  
Volatiles - Data Qualification Summary - SDG 1222208**

SDG	Sample	Compound	Flag	A or P	Reason
1222208	TB-9-111512 MW-6 DUPE-5-4Q12 MW-10 MW-9 MW-15 DUPE-6-4Q12 MW-5** MW-7	Bromomethane  Pentachloroethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
1222208	TB-9-111512 MW-6 DUPE-5-4Q12 MW-10 MW-9 MW-15 DUPE-6-4Q12 MW-5** MW-7	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL  
Volatiles - Laboratory Blank Data Qualification Summary - SDG 1222208**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 15, 2012  
**LDC Report Date:** December 26, 2012  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222208

### Sample Identification

MW-6  
DUPE-5-4Q12  
MW-10  
MW-9  
MW-15  
DUPE-6-4Q12  
MW-5\*\*  
MW-7  
MW-5MS  
MW-5MSD  
MW-5DUP

\*\*Indicates sample underwent EPA Level IV review

## 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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

## XII. 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 EPA Level III criteria.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples MW-6 and DUPE-5-4Q12 and samples MW-15 and DUPE-6-4Q12 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-6	DUPE-5-4Q12	
Chromium	2.2	2.5	13

Analyte	Concentration (ug/L)		RPD
	MW-15	DUPE-6-4Q12	
Chromium	0.92	0.50U	200

## XV. Field Blanks

No field blanks were identified in this SDG.

**NASA JPL**

**Chromium - Data Qualification Summary - SDG 1222208**

No Sample Data Qualified in this SDG

**NASA JPL**

**Chromium - Laboratory Blank Data Qualification Summary - SDG 1222208**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 15, 2012  
**LDC Report Date:** December 20, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 1222208

**Sample Identification**

MW-6  
DUPE-5-4Q12  
MW-10  
MW-9  
MW-15  
DUPE-6-4Q12  
MW-5\*\*  
MW-7  
MW-5MS  
MW-5MSD  
MW-5DUP

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration

All criteria for the initial calibration of each method were met.

## III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## IV. Blanks

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

The absolute value of the contaminant concentrations found in the initial, continuing and preparation blanks were less than the method reporting limit (MRL) with the following exceptions:

Method Blank ID	Analyte	Concentration	RL	Associated Samples	Flag	A or P
PBW	Hexavalent chromium	-0.0062480 mg/L	0.0020 mg/L	All samples in SDG 1222208	J (all detects) UJ (all non-detects)	A

## V. 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.

## VI. Duplicates

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

## VII. Laboratory Control Samples

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

### VIII. 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 EPA Level III criteria.

### IX. Overall Assessment of Data

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

### X. Field Duplicates

Samples MW-6 and DUPE-5-4Q12 and samples MW-15 and DUPE-6-4Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-6	DUPE-5-4Q12	
Hexavalent chromium	0.0011 mg/L	0.0011 mg/L	0
Perchlorate	1.4 ug/L	1.3 ug/L	7

### XI. Field Blanks

No field blanks were identified in this SDG.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG 1222208**

SDG	Sample	Analyte	Flag	A or P	Reason
1222208	MW-6 DUPE-5-4Q12 MW-10 MW-9 MW-15 DUPE-6-4Q12 MW-5** MW-7	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Method blanks (negative concentration)

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1222208**

No Sample Data Qualified in this SDG



**Laboratory Data Consultants, Inc.**

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Fax 760.634.0439

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

January 9, 2013

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 27, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 28994:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
12-21275	Volatiles
12-21655	Chromium
12-22272	Wet Chemistry

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- 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 5, 2012  
**LDC Report Date:** January 7, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21275

**Sample Identification**

TB-1-110512  
EB-1-110512  
MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
MW-19-5  
MW-19-4  
MW-20-1MS  
MW-20-1MSD

## Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were 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
11/12/12	Pentachloroethane	77.9	All samples in SDG 12-21275	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 12-21275	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.

## **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 RLs**

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-1-110512 was identified as a trip blank. No volatile contaminants were found.

Sample EB-1-110512 was identified as an equipment blank. No volatile contaminants were found.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 12-21275**

SDG	Sample	Compound	Flag	A or P	Reason
12-21275	TB-1-110512 EB-1-110512 MW-20-5 MW-20-4 MW-20-3 MW-20-2 MW-20-1 MW-19-5 MW-19-4	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
12-21275	TB-1-110512 EB-1-110512 MW-20-5 MW-20-4 MW-20-3 MW-20-2 MW-20-1 MW-19-5 MW-19-4	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 12-21275**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Field Blank Data Qualification Summary - SDG 0000**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2012  
**LDC Report Date:** January 7, 2013  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21275

**Sample Identification**

EB-1-110512  
MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
MW-19-5  
MW-19-4  
MW-20-1MS  
MW-20-1MSD  
MW-20-1DUP

## 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 Superfund Data Review (January 2010).

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.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

Raw data were not reviewed for this SDG.

## **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XIII. Overall Assessment of Data**

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

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample EB-1-110512 was identified as an equipment blank. No chromium was found.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 12-21275**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 12-21275**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 5, 2012  
**LDC Report Date:** January 7, 2013  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21275

**Sample Identification**

EB-1-110512  
MW-20-5  
MW-20-4  
MW-20-3  
MW-20-2  
MW-20-1  
MW-19-5  
MW-19-4  
EB-1-110512MS  
EB-1-110512MSD  
EB-1-110512DUP  
MW-20-1MS  
MW-20-1MSD  
MW-20-1DUP

## 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 and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Field Blanks**

Sample EB-1-110512 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL  
Wet Chemistry - Data Qualification Summary - SDG 12-21275**

No Sample Data Qualified in this SDG

**NASA JPL  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 12-21275**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 8, 2012  
**LDC Report Date:** January 7, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21655

### Sample Identification

TB-4-110812  
EB-4-110812  
MW-22-5  
MW-22-4  
MW-22-3  
MW-22-2  
MW-22-1  
MW-4-5  
MW-4-4  
MW-4-3  
MW-4-2  
MW-4-1  
MW-22-2MS  
MW-22-2MSD  
MW-4-3MS  
MW-4-3MSD

## 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 Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were 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
11/13/12	Bromomethane	40.4	All samples in SDG 12-21655	J (all detects)	P
	Methyl iodide	40.5		UJ (all non-detects)	
				J (all detects)	
				UJ (all non-detects)	

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 12-21655	J (all detects)	P
				UJ (all non-detects)	



## **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 RLs**

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-4-110812 was identified as a trip blank. No volatile contaminants were found.

Sample EB-4-110812 was identified as an equipment blank. No volatile contaminants were found.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 12-21655**

SDG	Sample	Compound	Flag	A or P	Reason
12-21655	TB-4-110812 EB-4-110812 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-4-5 MW-4-4 MW-4-3 MW-4-2 MW-4-1	Bromomethane  Methyl Iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
12-21655	TB-4-110812 EB-4-110812 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-4-5 MW-4-4 MW-4-3 MW-4-2 MW-4-1	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 12-21655**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Volatiles - Field Blank Data Qualification Summary - SDG 0000**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 8, 2012  
**LDC Report Date:** January 8, 2013  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21655

**Sample Identification**

EB-4-110812  
MW-22-5  
MW-22-4  
MW-22-3  
MW-22-2  
MW-22-1  
MW-4-5  
MW-4-4  
MW-4-3  
MW-4-2  
MW-4-1  
MW-22-2MS  
MW-22-2MSD  
MW-22-2DUP  
MW-4-3MS  
MW-4-3MSD  
MW-4-3DUP

## Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results 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. Internal Standards (ICP-MS)**

Raw data were not reviewed for this SDG.

## **X. Furnace Atomic Absorption QC**

Graphite furnace atomic absorption was not utilized in this SDG.

## **XI. ICP Serial Dilution**

ICP serial dilution was not performed for this SDG.

## **XII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **XIII. Overall Assessment of Data**

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

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample EB-4-110812 was identified as an equipment blank. No chromium was found with the following exceptions:

<b>Blank ID</b>	<b>Analyte</b>	<b>Concentration (ug/L)</b>
EB-4-110812	Chromium	0.72

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 12-21655**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 12-21655**

No Sample Data Qualified in this SDG



## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 8, 2012  
**LDC Report Date:** January 8, 2013  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-21655

### Sample Identification

EB-4-110812  
MW-22-5  
MW-22-4  
MW-22-3  
MW-22-2  
MW-22-1  
MW-4-5  
MW-4-4  
MW-4-3  
MW-4-2  
MW-4-1  
MW-22-2MS  
MW-22-2MSD  
MW-22-2DUP  
MW-4-3MS  
MW-4-3MSD  
MW-4-3DUP  
MW-4-1MS  
MW-4-1MSD  
MW-4-1DUP

## 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 314.0 for Perchlorate and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration

All criteria for the initial calibration of each method were met.

## III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## IV. Blanks

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

## V. 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-4-1MS/MSD (MW-4-1)	Hexavalent chromium	82.3 (85-115)	83.5 (85-115)	-	J (all detects) UJ (all non-detects)	A

## VI. Duplicates

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

## VII. Laboratory Control Samples

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

## VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Field Blanks**

Sample EB-4-110812 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG 12-21655**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
12-21655	MW-4-1	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 12-21655**

No Sample Data Qualified in this SDG

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NASA JPL  
**Collection Date:** November 16, 2012  
**LDC Report Date:** January 8, 2013  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-22272

### Sample Identification

TB-10-111612  
MW-13  
DUPE-7-4Q12  
MW-8  
DUPE-8-4Q12  
MW-1\*\*  
MW-16  
MW-1MS  
MW-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 Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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 advisory nature.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/18/12 (CCV-18NOV02)	Bromomethane	60.0	All samples in SDG 12-22272	J (all detects) UJ (all non-detects)	P
11/18/12 (CCV-18NOV03)	Pentachloroethane	46.2	All samples in SDG 12-22272	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/12	Pentachloroethane	47.4	All samples in SDG 12-22272	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.

## **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 EPA Level III criteria.

## **XII. Compound Quantitation and RLs**

All compound quantitation and RLs 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 EPA 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 EPA Level III criteria.

#### XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA 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-13 and DUPE-7-4Q12 and samples MW-8 and DUPE-8-4Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-13	DUPE-7-4Q12	
Bromodichloromethane	2.1	2.0	5
Carbon tetrachloride	0.43	0.45	5
Chloroform	8.3	8.5	2
1,1-Dichloroethene	0.24	0.24	0
Methylene chloride	0.49	0.48	2
Tetrachloroethene	0.13	0.14	7
Trichloroethene	0.11	0.12	9

Compound	Concentration (ug/L)		RPD
	MW-8	DUPE-8-4Q12	
Trichlorofluoromethane	0.24	0.20	18

#### XVII. Field Blanks

Sample TB-10-111612 was identified as a trip blank. No volatile contaminants were found.

**NASA JPL**  
**Volatiles - Data Qualification Summary - SDG 12-22272**

SDG	Sample	Compound	Flag	A or P	Reason
12-22272	TB-10-111612 MW-13 DUPE-7-4Q12 MW-8 DUPE-8-4Q12 MW-1** MW-16	Bromomethane  Pentachloroethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
12-22272	TB-10-111612 MW-13 DUPE-7-4Q12 MW-8 DUPE-8-4Q12 MW-1** MW-16	Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

**NASA JPL**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 12-22272**

No Sample Data Qualified in this SDG

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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 16, 2012  
**LDC Report Date:** January 8, 2013  
**Matrix:** Water  
**Parameters:** Chromium  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-22272

**Sample Identification**

MW-13  
DUPE-7-4Q12  
MW-8  
DUPE-8-4Q12  
MW-1\*\*  
MW-16

\*\*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.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. ICPMS Tune**

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

## **III. Calibration**

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

## **IV. Blanks**

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

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

ICP interference check sample (ICS) analysis was not required by the method.

## **VI. 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.

## **VII. 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.

## **VIII. Laboratory Control Samples (LCS)**

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

## **IX. Internal Standards (ICP-MS)**

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 EPA Level III criteria.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

## XII. 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 EPA Level III criteria.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples MW-13 and DUPE-7-4Q12 and samples MW-8 and DUPE-8-4Q12 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-13	DUPE-7-4Q12	
Chromium	23	43	61

Analyte	Concentration (ug/L)		RPD
	MW-8	DUPE-8-4Q12	
Chromium	1.5	1.4	7

## XV. Field Blanks

No field blanks were identified in this SDG.

**NASA JPL**  
**Chromium - Data Qualification Summary - SDG 12-22272**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Chromium - Laboratory Blank Data Qualification Summary - SDG 12-22272**

No Sample Data Qualified in this SDG



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

**Project/Site Name:** NASA JPL  
**Collection Date:** November 16, 2012  
**LDC Report Date:** January 8, 2013  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level III & IV  
**Laboratory:** BC Laboratories, Inc.  
**Sample Delivery Group (SDG):** 12-22272

**Sample Identification**

MW-13  
DUPE-7-4Q12  
MW-8  
DUPE-8-4Q12  
MW-1\*\*  
MW-16  
MW-1MS  
MW-1MSD  
MW-1DUP

\*\*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 and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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.

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 EPA 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.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- 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. Initial Calibration**

All criteria for the initial calibration of each method were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met for each method when applicable.

## **IV. Blanks**

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

## **V. 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.

## **VI. Duplicates**

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

## **VII. Laboratory Control Samples**

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

## **VIII. 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 EPA Level III criteria.

## **IX. Overall Assessment of Data**

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

## X. Field Duplicates

Samples MW-13 and DUPE-7-4Q12 and samples MW-8 and DUPE-8-4Q12 were identified as field duplicates. No contaminants were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-13	DUPE-7-4Q12	
Hexavalent chromium	0.0067 mg/L	0.0065 mg/L	3
Perchlorate	410 ug/L	420 ug/L	2

Analyte	Concentration		RPD
	MW-8	DUPE-8-4Q12	
Hexavalent chromium	0.00080 mg/L	0.00070U mg/L	200

## XI. Field Blanks

No field blanks were identified in this SDG.

**NASA JPL**  
**Wet Chemistry - Data Qualification Summary - SDG 12-22272**

No Sample Data Qualified in this SDG

**NASA JPL**  
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 12-22272**

No Sample Data Qualified in this SDG