

AMEC Earth & Environmental  
550 South Wadsworth Boulevard  
Suite 500  
Lakewood, CO 80226

|            |                 |
|------------|-----------------|
| Package ID | T711MT39        |
| Task Order | 313150010       |
| SDG No.    | IOB1566/IOB1567 |

Laboratory Del Mar Analytical

Reviewer L. Jarusewic

### Analysis/Method Metals

Rev 3 (5/2/00- lhw) L:\public\datava\ccsdtrax.frm

### Data Qualifier Reference Table

| Qualifier | Organics  | Inorganics   |
|-----------|---|--|
| U         | The analyte was analyzed for, but was not detected above the reported sample quantitation limit.  | The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. |
| J         | The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.  | The associated value is an estimated quantity.   |
| N         | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."   | Not applicable.  |
| NJ        | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.   | Not applicable.  |
| UJ        | The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. | The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.   |
| R         | The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.   | The data are unusable. (Note: Analyte may or may not be present).  |

## Qualification Code Reference Table

| Qualifier | Organics   | Inorganics   |
|-----------|--|--|
| H         | Holding times were exceeded.   | Holding times were exceeded.   |
| S         | Surrogate recovery was outside QC limits.  | The sequence or number of standards used for the calibration was incorrect                                   |
| C         | Calibration %RSD or %D were noncompliant.  | Correlation coefficient is <0.995.   |
| R         | Calibration RRF was <0.05.   | %R for calibration is not within control limits.   |
| B         | Presumed contamination from preparation (method) blank.  | Presumed contamination from preparation (method) or calibration blank.                                       |
| L         | Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.                               | Laboratory Control Sample %R was not within control limits.  |
| Q         | MS/MSD recovery was poor or RPD high.  | MS recovery was poor.  |
| E         | Not applicable.  | Duplicates showed poor agreement.  |
| I         | Internal standard performance was unsatisfactory.  | ICP ICS results were unsatisfactory.   |
| A         | Not applicable.  | ICP Serial Dilution %D were not within control limits.   |
| M         | Tuning (BFB or DFTPP) was noncompliant.  | Not applicable.  |
| T         | Presumed contamination from trip blank.  | Not applicable.  |
| +         | False positive – reported compound was not present. Not applicable.  |  |
| -         | False negative – compound was present but not reported.  | Not applicable.  |
| F         | Presumed contamination from FB, or ER.   | Presumed contamination from FB or ER.  |
| \$        | Reported result or other information was incorrect.  | Reported result or other information was incorrect.  |
| ?         | TIC identity or reported retention time has been changed.  | Not applicable.  |
| D         | The analysis with this flag should not be used because another more technically sound analysis is available. | The analysis with this flag should not be used because another more technically sound analysis is available. |
| P         | Instrument performance for pesticides was poor.  | Post Digestion Spike recovery was not within control limits.   |
| DNQ       | The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.   | The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.   |

\*#

Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (\*) will indicate the subsection where a description of the problem can be found (eg. \*1 would indicate a sample was not within temperature limits).

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# DATA VALIDATION REPORT

## NPDES Monitoring

### ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOB1566 & IOB1567

Prepared by

AMEC—Denver Operations  
550 South Wadsworth Boulevard, Suite 500  
Lakewood, Colorado 80226

## 1. INTRODUCTION

Task Order Title: NPDES Monitoring  
Contract Task Order #: 313150010  
SDG#: IOB1566/IOB1567  
Project Manager: B. McIlvaine  
Matrix: Water  
Analysis: Metals  
QC Level: Level IV  
No. of Samples: 2  
No. of Reanalyses/Dilutions: 0  
Reviewer: L. Jarusewic  
Date of Review: March 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0)*, *AMEC Data Validation Procedure for Levels III and IV ICP Metals (DVP-5, Rev. 0)*, *SW-846 Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, *SW-846 Method 6010B for Inductively Coupled Plasma*, *SW-846 Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the *USEPA CLP National Functional Guidelines for Inorganic Data Review (2/94)*. Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the “R” data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

**Table 1. Sample identification**

| Client ID    | EPA ID       | Laboratory ID | Matrix | COC Method |
|--------------|--------------|---------------|--------|------------|
| Ambient      | Ambient      | IOB1566-01    | Water  | ILM04      |
| Upstream 002 | Upstream 002 | IOB1567-01    | Water  | ILM04      |

## 2. DATA VALIDATION FINDINGS

### 2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

#### 2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

#### 2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs accounted for all samples and analyses presented in these SDGs. No sample qualifications were required.

#### 2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analysis recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP and ICP/MS metals and 28 days for mercury. No qualifications were required.

### 2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses. The %RSDs for the tune were all within the 5% control limit. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

### 2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP and ICP/MS and 80-120% for mercury. The arsenic reporting limit check standard recoveries were below the control limit; therefore, nondetected arsenic in sample Upstream 002 was qualified as estimated, "UJ," (see section 2.4). The remaining reporting limit check standards were recovered within the AMEC control limits of 70-130%. No further qualifications were required.



## 2.4 BLANKS

There were detects and negative results reported for the method blanks and bracketing CCBs associated with the samples in these SDGs. Antimony was detected in a bracketing CCB at 0.72 µg/L; therefore, detected antimony in sample Upstream 002 was qualified as estimated, "UJ." Thallium and arsenic were detected in bracketing CCBs at 0.08 µg/L and 0.0040 mg/L, respectively; therefore, thallium and arsenic detected in sample Upstream 002 was qualified as estimated, "UJ." No further qualifications were required due to the method and calibration blank results.

The antimony CCB detects indicated the laboratory could not detect antimony at the level reported in the CCBs. The reviewer, therefore, raised the MDLs for antimony to the level reported in the CCBs, 0.72 µg/L and raised the nondetected result for Upstream 002 to the same level (see above). No further qualifications were required due to the method and calibration blank results.

## 2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for the ICP/MS spiked interferents phosphorus, sulfur, carbon, chloride, and titanium. The reviewer noted that positive results for cadmium and copper above the reporting limit were reported in the ICSA analysis. The results for potassium and sodium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. The result for aluminum was low in the ICSA analysis with a recovery of 78.9% and exceeded the calibration range of the instrument in the ICSAB analysis. Selenium, antimony, lead, and thallium were not spiked into the ICSAB solution; therefore, the ICSAB recoveries could not be assessed. The validator reviewed the raw data for the site samples ICS/MS analyses for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix effects. No assessment could be made with respect to possible interference from phosphorus, sulfur, carbon, chloride, and titanium.

The recoveries for the interferents and spiked analytes were within the control limits of 80-120% for the ICP analyses. Detects for zinc and negative results for chromium that were greater than the applicable reporting limits were reported in the ICSA analyses; however, the validator reviewed the raw data for the site sample ICP analysis for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No sample qualifications were required due to the ICP ICS analysis.

## 2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP LCS samples were identified as 5B24096-BS1 and 5B24093-BS1. The ICP/MS LCS sample was identified as 5B24099-BS1 and the Hg LCS sample was identified as 5B22063-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP, ICP/MS, and mercury control limits of 85-115%. No qualifications were required.

## **2.7 LABORATORY DUPLICATES**

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

## **2.8 MATRIX SPIKE**

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

## **2.9 FURNACE ATOMIC ABSORPTION QC**

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

## **2.10 ICP/MS SERIAL DILUTION**

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

## **2.11 INTERNAL STANDARDS PERFORMANCE**

The ICP and ICP/MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

## **2.12 SAMPLE RESULT VERIFICATION**

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No further qualifications were required.

## **2.13 FIELD QC SAMPLES**

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

### **2.13.1 Field Blanks and Equipment Rinsates**

The samples in these SDGs had no associated field QC samples. No qualifications were required.

### **2.13.2 Field Duplicates**

There were no field duplicate analyses performed in association with the site samples.



# Del Mar Analytical

17461 Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297  
 1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046  
 9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689  
 9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851  
 2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing  
 300 North Lake Avenue, Suite 1200  
 Pasadena, CA 91101  
 Attention: Bronwyn Kelly

Project ID: Ambient Stormwater  
 Ambient  
 Report Number: IOB1566

Sampled: 02/18/05  
 Received: 02/18/05

## METALS

| Analyte                                 | Method    | Batch   | MDL Limit | Reporting Limit | Sample Result | Dilution Factor | Date Extracted | Date Analyzed | Data Qualifiers |
|---|-----------|---------|-----------|-----------------|---------------|-----------------|----------------|---------------|-----------------|
| Sample ID: IOB1566-01 (Ambient - Water) |           |         |           |                 |               |                 |                |               | REV QUAL        |
| Reporting Units: mg/l                   |           |         |           |                 |               |                 |                |               | QUAL CODE       |
| Barium                                  | EPA 200.7 | 5B24096 | 0.0028    | 0.010           | ND            | 1               | 02/24/05       | 02/24/05      | U               |
| Boron                                   | EPA 200.7 | 5B24096 | 0.0074    | 0.050           | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Iron                                    | EPA 200.7 | 5B24096 | 0.0088    | 0.040           | ND            | 1               | 02/24/05       | 02/24/05      | ↓               |
| Sample ID: IOB1566-01 (Ambient - Water) |           |         |           |                 |               |                 |                |               |                 |
| Reporting Units: ug/l                   |           |         |           |                 |               |                 |                |               |                 |
| Antimony                                | EPA 200.8 | 5B24099 | 0.18      | 2.0             | ND            | 1               | 02/24/05       | 02/25/05      | U               |
| Arsenic                                 | EPA 200.7 | 5B24096 | 3.8       | 5.0             | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Beryllium                               | EPA 200.7 | 5B24096 | 0.62      | 2.0             | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Cadmium                                 | EPA 200.8 | 5B24099 | 0.015     | 1.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Chromium                                | EPA 200.7 | 5B24096 | 0.68      | 5.0             | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Cobalt                                  | EPA 200.7 | 5B24096 | 0.89      | 10              | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Copper                                  | EPA 200.8 | 5B24099 | 0.49      | 2.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Lead                                    | EPA 200.8 | 5B24099 | 0.13      | 1.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Manganese                               | EPA 200.7 | 5B24096 | 3.2       | 20              | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Mercury                                 | EPA 245.1 | 5B22063 | 0.063     | 0.20            | ND            | 1               | 02/22/05       | 02/22/05      |                 |
| Nickel                                  | EPA 200.7 | 5B24096 | 2.0       | 10              | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Selenium                                | EPA 200.8 | 5B24099 | 0.36      | 2.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Silver                                  | EPA 200.8 | 5B24099 | 0.089     | 1.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Thallium                                | EPA 200.8 | 5B24099 | 0.075     | 1.0             | ND            | 1               | 02/24/05       | 02/25/05      |                 |
| Vanadium                                | EPA 200.7 | 5B24096 | 1.4       | 10              | ND            | 1               | 02/24/05       | 02/24/05      |                 |
| Zinc                                    | EPA 200.7 | 5B24096 | 3.7       | 20              | ND            | 1               | 02/24/05       | 02/24/05      |                 |

**AMEC VALIDATED**

**LEVEL IV**

Del Mar Analytical, Irvine  
 Michele Harper  
 Project Manager

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