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February 18, 2010
 Nobis File No. 80013

Ms. Christine Clark
 Regional Sample Control Coordinator
 U.S. Environmental Protection Agency
 Region I
 11 Technology Drive
 No. Chelmsford, MA 01863

Superfund Records Center
 SITE: Chlor-Alkali
 BREAK: 3.2
 OTHER: _____



SDMS DocID 463249

Re: Contract No.: EP-S1-06-03
 Task Order No. 80013-RI-CO-01BQ
 Case No. 39067; Sample Delivery Group (SDG) No. MA31M4
 ALS DataChem Laboratories, Inc., Salt Lake City, UT
 Chlor-Alkali Facility (Former) Superfund Site
 Berlin, New Hampshire
 CERCLIS No.: NHN000103313
 Tier II Inorganic Data Validation

Metals: 6/Water/ MA31M4, MA31M6, MA31M8, MA31N1, MA31N3, MA31N5
 Equipment blank: MA31N5
 No Field duplicate
 No PE sample

Dear Ms. Clark:

Nobis Engineering, Inc. performed a Tier II data validation in accordance with the "Part IV, Inorganic Data Validation Functional Guidelines", November 2008 of the *Region I, EPA New-England Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996* on the inorganic analytical data for six water samples and one equipment blank collected by Nobis Engineering, Inc. at the Chlor-Alkali Facility (Former) Superfund Site in Berlin, New Hampshire. The samples were analyzed for total metals, including mercury, under the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) according to the ILM05.4 Statement of Work (SOW) with modification 1783.0. This SDG includes total aluminum, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, vanadium, and zinc results analyzed by ICP-AES and mercury results analyzed by CVAA. Other total metal results analyzed by ICP-MS can be found in SDG MA31M6, under a separate memorandum.

The data were evaluated based on the following parameters:

- * • Overall Evaluation of Data and Potential Usability Issues
 - * • Data Completeness
 - * • Preservation and Technical Holding Times
 - NA • ICP-MS Tune Analysis
 - * • Initial and Continuing Calibrations
 - Quantitation Limit Check Standard (CRI)
 - Blanks
 - ICP Interference Check Results
 - * • Matrix Spike Recoveries
 - * • Laboratory Duplicates
 - NA • Field Duplicates
 - * • Lab Control Sample Results
 - NA • Furnace AA Results
 - NA • Method of Standard Addition (MSA)
 - ICP Serial Dilution Results
 - NA • ICP-MS Internal Standards
 - * • CRQL/Method Detection Limit (MDL) Results
 - * • PE Samples/Accuracy Check
 - * • Sample Quantitation
- * All criteria were met for this parameter.

Note: Worksheets, except for Worksheet XIII – Sample Quantitation, are not included for parameters that have met criteria or for criteria that are not applicable (NA) to the method.

The following information was used to generate the Data Validation Memorandum attachments:

Table I: Recommendation Summary Table - Summarizes validation recommendations

Table II: Overall Evaluation of Data - Summarizes site DQOs and potential usability issues

Data Summary Table: Summarizes accepted, qualified, and rejected data

Overall Evaluation of Data and Potential Usability Issues

Following is a summary of the site DQOs:

- Accurate identification of environmental bioaccumulation risks from site contamination.
- Determination of where and what magnitude of risk applies for:
 - Humans, likely from incidental ingestion and dermal contact with sediments and surface waters, as well as consumption of fish;
 - Ecological assessment endpoints; and
 - Filling of existing data gaps throughout the study area.

The data was qualified due to Quantitation Limit Check Standard analyte recovery, blank contamination, non-compliant ICP Interference analysis and Serial Dilution samples.

Quantitation Limit Check Standard (CRI)

Aluminum did not meet the QC criteria for the QLCD. The analyte recovery was higher than the upper limit of the method QC acceptance criteria but was lower than 180%. The positive detects less than 2x the QL Check Standard true value (<400 ug/L) were estimated (J). The following samples were affected: MA31M6 and MA31M8. Results may be bias high. Also, samples MA31N3 and MA31N5 were affected but were below CRQL and already estimated (J); therefore no further action was necessary on those results.

Iron did not meet the QC criteria for the QLCD. The analyte recovery was higher than the upper limit of the method QC acceptance criteria but was lower than 180%. The positive detects less than 2x the QL Check Standard true value (<200 ug/L) were estimated (J). Sample MA31N5 was affected; however, the result was below CRQL and already estimated (J) therefore no further action was necessary.

Blanks

Positive Blank Results were detected in the following metals at various concentrations: aluminum, barium, cadmium, calcium, cobalt, copper, iron, manganese, potassium, sodium, silver, vanadium, and zinc.

Negative Blank Results were detected in magnesium in CCB4 only. Since CCB4 and preceding CCB3 were analyzed after all samples were already analyzed for magnesium therefore none of the samples were affected.

Reported results for cadmium, calcium, cobalt, iron, manganese, sodium, and silver were all above the Blank Action Levels and therefore were not impacted by the positive blank detections.

Sample results required qualifications are summarized below.

Analyte	Type of Blank	Date Blank Originated	Max. Conc. (ug/L)	Blank Action Level (ug/L)	Sample CRQL (ug/L)	Action	Samples Affected
Aluminum	EB/CCB4	10/14/2009 11/2/2009	70.7/88.5	353/443	200	U ¹	MA31M8*, MA31N3
Barium	EB	10/14/2009	6.90	34.5	200	U ²	MA31M4,
Copper	CCB3	11/2/2009	3.52	17.6	25	U ³	MA31N3; MA31N5
Potassium	EB	10/14/2009	2,180	10,900	5,000	U ⁴	MA31M4, MA31M8, MA31N1, MA31N3
Vanadium	CCB2	11/2/2009	0.811	4.06	50	U ⁵	MA31N3
Zinc	EB	10/14/2009	41.7	209	60	U ⁶	MA31M4, MA31M6, MA31M8, MA31N1, MA31N3

CCB = Continuing Calibration Blank
EB=Equipment/Field Blank
ICB = Initial Calibration Blank

* The positive Aluminum result in Sample MA31N8 was qualified as estimated (J), due to the blank contamination; the result was re-qualified to a non-detect and the QL was raised to the sample result.

ICP Interference Check Sample Results

Arsenic and Barium were recovered in the ICSA samples above the acceptance criteria. The following positive detects were qualified as estimated (J): for Arsenic MA31M4; MA31M8 and MA31N1 and for Barium MA31N1. Those detects may be bias high. Other positive reported results were already estimated (J) therefore no further action was necessary.

Manganese was recovered in the ICSA samples above the acceptance criteria. However, since the ICSAB results were within the recovery criteria, only those positive sample results less than the ICSAB true value were qualified as estimated (J). The following positive detects were affected: MA31M4; MA31M6 and MA31M8.

Cobalt was recovered in the ICSA samples below the acceptance criteria. Positive detect sample MA31N1 was affected. However, since the result was already estimated (J) no further action was necessary. The positive detects may be bias low. The non-detect sample results were estimated (UJ).

Potassium and Sodium were recovered in the ICSAB and ICSA samples at concentrations above the acceptance criteria. Positive detect samples for both potassium and sodium were qualified as estimated (J). The positive detects may be bias high.

Matrix Spike Recoveries

Aluminum did not meet the QC acceptance criteria; the spike recovery was higher than the upper limit of the QC acceptance criteria. However, the matrix spike analyte in the field sample that was chosen for the matrix spike were at high concentrations before spiking (4x higher than the spike concentration). Professional judgment was used not to estimate the positive results.

ICP Serial Dilution Sample Results

The serial dilution percent difference for copper is greater than the method QC acceptance criteria and the serial dilution sample result is greater than the undiluted sample result. The issue affected all samples. All positive detects were estimated (J) and may be bias low. The reporting limit for copper detected in samples MA31N3 and MA31N5 were raised previously due to blank contamination and reported as non-detected (U) values. Those results were qualified as estimated (UJ).

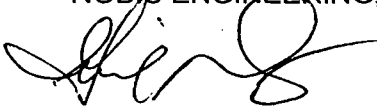
PE Samples

No PE samples were included in this SDG.

Please contact Gail DeRuzzo at (978) 703-6021 should you have any questions or comments regarding this information.

Very truly yours,

NOBIS ENGINEERING, INC.



Gail DeRuzzo
Lead Chemist



Paul Swift, PhD, PE
Subcontractor Data Validator
WESTON SOLUTIONS, INC.

Tables: Table I: Recommendation Summary Table for Total Metals
 Table II: Overall Evaluation of Total Metals Data
 Data Summary Table

Enclosures: Data Validation Worksheets
 CCS Reports
 PE Score Reports (N/A)
 Region Electronic Correspondence (N/A)
 Field Sampling Notes
 CSF Audit (DC-2 Form)
 DQO Summary

cc: Darryl Luce, EPA Site Manager (w/o Enclosures)
 Don Goodrich USEPA Region VIII (w/ Enclosures)

TABLE I

**Recommendation Summary Table for Total Metals
Chlor-Alkali Facility (Former) Superfund Site
Case 39067; SDG MA31M4**

Element	Matrix	Qualifiers
Aluminum	Water	J ¹ , U ¹
Arsenic	Water	J ³
Barium	Water	U ² , J ⁴
Cadmium	Water	A
Calcium	Water	A
Chromium	Water	A
Cobalt	Water	UJ ⁸
Copper	Water	U ³ , J ² /UJ ²
Iron	Water	A
Lead	Water	A
Magnesium	Water	A
Manganese	Water	J ⁵
Mercury	Water	A
Nickel	Water	A
Potassium	Water	U ⁴ , J ⁶
Selenium	Water	A
Silver	Water	A
Sodium	Water	J ⁷
Vanadium	Water	U ⁵
Zinc	Water	U ⁶

A - Accept the data.

U¹⁻⁶ - Positive results were qualified non-detected due to equipment and laboratory blank contaminations.

J¹ - Estimate the positive Aluminum results (<400ug/L) due to poor Quantitation Limit Check Standard (QLCS) recoveries. Results may be bias high.

J²/UJ²- Estimate the positive and non-detected Copper results due to non-compliant serial dilution results. The results might be biased low.

J³⁻⁵ - Estimate the positive Arsenic, Barium and Manganese results in all samples due to poor ICSA recoveries. Results may be bias high.

J⁶⁻⁷ - Estimate the positive Potassium and Sodium results in all samples due to poor ICSA and ICSAB recoveries. Results may be bias high.

UJ⁸ - Estimate the non-detect Cobalt results in all samples due to poor ICSA recoveries. Results may be bias low.

TABLE II

Overall Evaluation of Total Metals Data
Chlor-Alkali Facility (Former) Superfund Site
Case 39067; SDG MA31M4

DQO (list all DQOs)	Sampling and/or Analytical Method Appropriate Yes or No	Metals		Sampling Variability**	Potential Usability Issues
		Measurement Error			
		Analytical Error	Sampling Error*		
<p>Accurate identification of environmental bioaccumulation risks from site contamination.</p> <p>Determination of where and what magnitude of risk applies for: -Humans, likely from incidental ingestion and dermal contact with sediments and surface waters, as well as consumption of fish; -Ecological assessment endpoints -Filling of existing data gaps throughout the study area.</p>	<p>Yes, ILM05.4 analytical methods and sampling procedures according to the requirements of the QAAP are appropriate for all samples.</p>	<p>Refer to qualifications in R/S key: U³, U⁵, J¹, J² /UJ², J³⁻⁵, J⁶⁻⁷ UJ⁸</p>	<p>Refer to qualifications in R/S key: U¹⁻², U⁴ U⁶</p>		<p>U¹⁻², U⁴, U⁸ - Positive results were qualified non-detected due to equipment blank contaminations.</p> <p>U³, U⁵ - Positive results were qualified non-detected due to laboratory blank contaminations</p> <p>J¹ - Estimate the positive Aluminum results (<400ug/L) due to poor Quantitation Limit Check Standard (QLCS) recoveries. Results may be bias high.</p> <p>J²/UJ² - Estimate the positive and non-detected Copper results due to non-compliant serial dilution results. Results might be biased low.</p> <p>J³⁻⁵ - Estimate the positive Arsenic, Barium and Manganese results in all samples due to poor ICSA recoveries. Results may be bias high.</p> <p>J⁶⁻⁷ - Estimate the positive Potassium and Sodium results in all samples due to poor ICSA and ICSAB recoveries. Results may be bias high.</p> <p>UJ⁸ - Estimate the non-detected Cobalt results in all samples due to poor ICSA recoveries. Results may be bias low.</p>

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

DATA SUMMARY TABLE

Tier II Validated Data

Total Metals

Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH

CASE NO.: 39067 SDG NO.: MA31M4

Sample Name:		MA31M4		MA31M6		MA31M8		MA31N1		MA31N3	
Sample Location:		MW-26B1		MW-25B1		MW-25B1		MW-24OB		MW-31O1	
Lab Sample ID:		9287044001		9287044002		9287044003		9288029001		9288029002	
Station ID:		MW-26B1-1012-1130		MW-25B1-1012-1705		MW-25B1-1013-0930		MW-24OB-1013-1125		MW-31O1-1013-1600	
Dilution Factor:		1/10 Hg		1/2 Hg		1/2 Hg		1/10 Hg		1	
Sample Date:		12 Oct 09		12 Oct 09		13 Oct 09		13 Oct 09		13 Oct 09	
Date Hg Analyzed:		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09	
Date Analyzed:		02 Nov 09		02 Nov 09		02 Nov 09		02 Nov 09		02 Nov 09	
Chemical	CRQL										
ALUMINUM	200	1270		378	J	307	U	14500		200	U
ARSENIC	10	10	J	9.9	J	15	J	12.7	J	5.6	J
BARIUM	200	200	U	115	J	74.6	J	326	J	75.5	J
CADMIUM	5	1.4	J	3.4	J	3.8	J	2.2	J	2.3	J
CALCIUM	5000	14600		30200		19900		6530		45100	
CHROMIUM	10	11.2		5	J	5.9	J	25.5		10	U
COBALT	50	50	UJ	50	UJ	50	UJ	15.9	J	50	UJ
COPPER	25	125	J	98.9	J	116	J	141	J	25	UJ
IRON	100	2480		600		649		28400		48400	
LEAD	10	30.4		39.5		47.5		156		10	U
MAGNESIUM	5000	431	J	5000	U	5000	U	3370	J	3750	J
MANGANESE	15	144	J	28.1	J	37.8	J	1240		1820	
MERCURY	0.2	63.6		12		14.4		73.1		0.2	U
NICKEL	40	2.8	J	40	U	1.7	J	16.2	J	40	U
POTASSIUM	5000	6000	U	21300	J	9400	U	5000	U	6770	U
SELENIUM	35	6	J	17.3	J	16.1	J	35	U	35	U
SILVER	10	6.9	J	4.7	J	4.4	J	1.7	J	10	U
SODIUM	5000	719000	J	1570000	J	2140000	J	383000	J	24200	J
VANADIUM	50	79.9		66.6		97.8		28.5	J	50	U
ZINC	60	196	U	60	U	60	U	115	U	60	U

See SDG MA31M6 for ICP-MS results.

DATA SUMMARY TABLE

Tier II Validated Data

Total Metals

Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH

CASE NO.: 39067 SDG NO.: MA31M4

Sample Name:		MA31N5	
Sample Location:		Equipment Blank	
Lab Sample ID:		9288029003	
Station ID:		EB-02-1014-0800	
Dilution Factor:		1	
Sample Date:		14 Oct 09	
Date Hg Analyzed:		28 Oct 09	
Date Analyzed:		02 Nov 09	
Chemical	CRQL		
ALUMINUM	200	200	U
ARSENIC	10	10	U
BARIUM	200	6.9	J
CADMIUM	5	5	U
CALCIUM	5000	367	J
CHROMIUM	10	10	U
COBALT	50	50	UJ
COPPER	25	25	UJ
IRON	100	24.7	J
LEAD	10	10	U
MAGNESIUM	5000	5000	U
MANGANESE	15	15	U
MERCURY	0.2	0.2	U
NICKEL	40	40	U
POTASSIUM	5000	2180	J
SELENIUM	35	35	U
SILVER	10	0.33	J
SODIUM	5000	178	J
VANADIUM	50	50	U
ZINC	60	41.7	J

See SDG MA31M6 for ICP-MS results.