



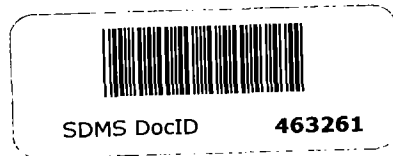
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January 30, 2010
 Nobis File No. 80013

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: 463261

Re: Contract No.: EP-S1-06-03
 Task Order No. 80013-RI-CO-01BQ
 Case No. 39067; Sample Delivery Group (SDG) No. MA31G1
 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: 19/Water/MA31G1, MA31G3, MA31G5, MA31G7, MA31G9, MA31H1,
 MA31H3, MA31H5, MA31H7, MA31J2, MA31J4, MA31J6, MA31J8, MA31K0,
 MA31K2, MA31K4, MA31K6, MA31L3, MA31L5
 Equipment blank: MA31H9
 Field Duplicates: MA31J6/MA31J8
 PE sample: MA31L0 (IS5974), MA31L2 (HG5654)

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 19 water samples, one aqueous equipment blank, and two PE samples, collected by Nobis Engineering, Inc. at the Chlor-Alkali Facility (Former) Superfund Site in Berlin, New Hampshire. The samples were analyzed for total metals, under the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) according to the ILM05.4 Statement of Work (SOW) with modification 1783. This SDG includes 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.

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
 - * • 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
 - Filling of existing data gaps throughout the study area.

The data required qualifications resulting from blank contamination, non-compliant ICS A results, and non-compliant serial dilution percent difference.

Blanks

The following metals were detected in blanks at varying concentrations: aluminum, arsenic, cadmium, calcium, chromium, cobalt, copper, nickel, potassium, sodium, and zinc.

Barium, copper, lead, potassium and selenium were found in blanks at negative concentrations. Only selenium was found in some samples at concentrations less than the action level. The detected selenium results and the quantitation limits of the non-detected results might be biased low, thus estimated (J/UJ).

Sample results which 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	CCB4	10/21/09	42.123	210.62	200	U	MA31H7, MA31J8
Arsenic	PBW	10/19/09	2.544	12.72	10	U	MA31G1, MA31G5, MA31G7, MA31H1, MA31H5, MA31H7, MA31H9, MA31J4, MA31J6, MA31J8, MA31K4, MA31K6, MA31L3
Cadmium	CCB2	10/21/09	0.225	1.13	5	U	MA31G1, MA31G5, MA31G7, MA31H5, MA31J2, MA31J4, MA31J6, MA31J8, MA31K4, MA31K6, MA31L3
Calcium	PBW	10/19/09	51.96	259.8	5,000	U	MA31H9
Chromium	CCB2	10/21/09	0.907	4.54	10	U	MA31G3, MA31G7, MA31H3, MA31H7, MA31J4, MA31J6, MA31K4, MA31K6, MA31L3
Cobalt	CCB2	10/21/09	1.126	5.63	50	U	MA31G5, MA31G7, MA31H7, MA31J4, MA31K6
Copper	CCB2	10/21/09	2.397	11.99	25	U	MA31G3, MA31G7, MA31H9, MA31J4, MA31J6, MA31J8, MA31K4, MA31K6, MA31L3
Nickel	PBW	10/19/09	0.788	3.94	40	U	MA31G7, MA31H9, MA31J4, MA31J6, MA31K0, MA31K4, MA31K6, MA31L3, MA31L5
Potassium	EB	10/7/09	615	3,075	5,000	U	MA31J4, MA31K0, MA31L3
Sodium	CCB4	10/21/09	123.713	618.57	5,000	U	MA31H9
Zinc	PBW	10/19/09	6.033	30.17	60	U	MA31G3, MA31G7, MA31H3, MA31H7, MA31H9, MA31J4, MA31J6, MA31J8, MA31K0, MA31K2, MA31K6, MA31L3

CCB = Continuing Calibration Blank
PBW = Preparation Blank Water
EB = Equipment Blank

ICP Interference Check Results

Cobalt recoveries were below the control limits in Interference Check Solution A (ICS A). Since its recoveries in the ICS AB and CRI analyses were acceptable, one may suspect that, if detected at concentrations less than 50 ug/L for cobalt the affected analyte result may be biased low. Therefore, the presence of cobalt was estimated (J/UJ) as follows:

Co – All samples

Copper and manganese recoveries were above the control limits in one or more of the ICS A. Since their recoveries in the ICS AB and CRI analyses were acceptable, one may suspect that, if detected at concentrations less than 25 ug/L for copper or 500 ug/L for manganese the affected analyte result may be biased high. Copper was not detected or was detected at a concentration greater than the CRI in the affected sample; no action was required. The presence of manganese was estimated (J) as follows:

Mn – MA31G1, MA31G5, MA31G9, MA31H1, MA31H3, MA31H5, MA31J2, MA31J4, MA31K0, MA31K2, MA31K4, MA31L3, MA31L5

In the ICS A analyses, the following analyte results were not within control limits: cadmium, potassium, sodium, and vanadium. Since the interferent concentrations in all samples, except for MA31G3 and MA31G9 were less than 50% of those in the ICS A solutions, only these two samples were impacted by interferences.

For MA31G3, the presence of cadmium is suspect since the estimated interference is greater than 90% of the sample result, thus rejected (R). For MA31G9, the presence of cadmium may be biased-high due to iron interference, thus estimated (J).

For MA31G3, the negative vanadium concentrations detected in ICS A analyses may represent a biased-low result due to iron interference, thus estimated (J).

ICP Serial Dilution Results

The percent difference (%D) for manganese (21%) and sodium (12%) in the serial dilution of sample MA31J4 exceeded quality control criteria of ≤ 10 %D. The positive manganese and sodium results were estimated (J) in all groundwater samples.

PE Samples/Accuracy Check

The PE samples MA31L0 (IS5974) and MA31L2 (HG5654) were provided by EPA. Their results were evaluated and found acceptable.

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.

Gloria J. Switalski, Senior Project Scientist
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
 Region Electronic Correspondence
 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 MA31G1

Element	Matrix	Qualifiers
Aluminum	Water	U ¹
Arsenic	Water	U ²
Barium	Water	A
Cadmium	Water	U ³ , J ³ , R ¹
Calcium	Water	U ⁴
Chromium	Water	U ⁵
Cobalt	Water	U ⁶ , J ² /UJ ²
Copper	Water	U ⁷
Iron	Water	A
Lead	Water	A
Magnesium	Water	A
Manganese	Water	J ⁵ , J ⁶
Mercury	Water	A
Nickel	Water	U ⁸
Potassium	Water	U ⁹
Selenium	Water	J ¹ /UJ ¹
Silver	Water	A
Sodium	Water	U ¹⁰ , J ⁷
Vanadium	Water	J ⁴
Zinc	Water	U ¹¹

A - Accept the data.

U¹⁻¹¹ - Positive results were qualified non-detected due to blank contaminations.

J¹/UJ¹ - The positive and non-detected selenium results were estimated in all samples due to concentrations less than the negative blank action level.

J²/UJ² - The positive and non-detected cobalt results were estimated in all samples due to non-compliant ICS A results. These results may be biased low.

J³ - The positive cadmium result was estimated in MA31G9 due to non-compliant ICS A analysis. The result might be biased high.

J⁴ - The positive vanadium result was estimated in MA31G3 due to non-compliant ICS A analysis. The result might be biased high.

J⁵ - Positive manganese results were estimated in MA31G1, MA31G5, MA31G9, MA31H1, MA31H3, MA31H5, MA31J2, MA31J4, MA31K0, MA31K2, MA31K4, MA31L3, MA31L5 due to non-compliant ICS A analysis. These results might be biased high.

J⁶ - Positive manganese results were estimated in all samples due to non-compliant serial dilution percent difference.

J⁷ - Positive sodium results were estimated in all samples due to non-compliant serial dilution percent difference.

R¹ - The positive cadmium result was rejected in MA31G1 due to non-compliant ICS A analysis. This result is suspected to be a false positive.

TABLE II

Overall Evaluation of Total Metals Data
Chlor-Alkali Facility (Former) Superfund Site
Case 39067; SDG MA31G1

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: U^{1-8,10,11}, J¹/UJ¹, J²/UJ², J³, J⁴, J⁵, J⁶, J⁷, R¹</p>	<p>Refer to qualifications in R/S key: U⁹</p>		<p>U¹⁻¹¹ - Positive results for aluminum, arsenic, cadmium, calcium, chromium, cobalt, copper, nickel, potassium, sodium, and zinc were qualified non-detected due to blank contaminations.</p> <p>J¹/UJ¹ - The positive and non-detected selenium results were estimated in all samples due to concentrations less than the negative blank action level.</p> <p>J²/UJ² - The positive and non-detected cobalt results were estimated in all samples due to non-compliant ICS A results. These results may be biased low.</p> <p>J³ - The positive cadmium result was estimated in MA31G9 due to non-compliant ICS A analysis. The result might be biased high.</p>

					<p>J⁴- The positive vanadium result was estimated in MA31G3 due to non-compliant ICS A analysis. The result might be biased high.</p> <p>J⁵- Positive manganese results were estimated in MA31G1, MA31G5, MA31G9, MA31H1, MA31H3, MA31H5, MA31J2, MA31J4, MA31K0, MA31K2, MA31K4, MA31L3, MA31L5 due to non-compliant ICS A analysis. These results might be biased high.</p> <p>J⁶- Positive manganese results were estimated in all samples due to non-compliant serial dilution percent difference.</p> <p>J⁷- Positive sodium results were estimated in all samples due to non-compliant serial dilution percent difference.</p> <p>R¹- The positive cadmium result was rejected in MA31G1 due to non-compliant ICS A analysis. This result is suspected to be a false positive.</p>
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* 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 Analysis
Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH
CASE NO.: 39067 SDG NO.: MA31G1

Sample Name:		MA31G1		MA31G3		MA31G5		MA31G7		MA31G9	
Sample Location:		MW-24B1		MW-22		MW-20A		MW-23A		MW-20B	
Lab Sample ID:		9283008001		9283008002		9283008003		9283008004		9283008005	
Station ID:		MW-24B1-1007-1000		MW-22-1007-0850		MW-20A-1007-0850		MW-23A-1007-1205		MW-20B-1007-1305	
Dilution Factor:		1		1		1		1		1	
Sample Date:		07 Oct 09		07 Oct 09		07 Oct 09		07 Oct 09		07 Oct 09	
Date Fe,Mg,Mn Analyzed:		23 Oct 09		23 Oct 09		23 Oct 09		23 Oct 09		23 Oct 09	
Date Hg Analyzed:		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09	
Date Analyzed:		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09	
Chemical	CRQL										
ALUMINUM	200	3080		289		1660		251		3750	
ARSENIC	10	10	U	18.7		12	U	10	U	110	
BARIUM	200	28.6	J	54.7	J	88	J	46.9	J	375	
CADMIUM	5	5	U	2	R	5	U	5	U	3.5	J
CALCIUM	5000	6520		54600		20000		20900		48300	
CHROMIUM	10	10.8		10	U	25.2		10	U	251	
COBALT	50	8.1	J	50	UJ	50	UJ	50	UJ	6.3	J
COPPER	25	27.2		25	U	40.9		25	U	43	
IRON	100	4570		49900		11500		15700		48600	
LEAD	10	16.8		2.7	J	69.8		5.3	J	97.5	
MAGNESIUM	5000	809	J	5750		2410	J	3320	J	356	J
MANGANESE	15	260	J	2090		487	J	1290		207	J
MERCURY	0.2	5.3		0.1	J	7.5		0.13	J	1.8	
NICKEL	40	4.1	J	40	U	14.3	J	40	U	198	
POTASSIUM	5000	7530		13500		7510		14100		11600	
SELENIUM	35	35	UJ	35	UJ	35	UJ	35	UJ	20.9	J
SILVER	10	1.5	J	0.61	J	0.34	J	0.48	J	1.5	J
SODIUM	5000	170000	J	25500	J	358000	J	13900	J	3370000	J
VANADIUM	50	6.3	J	1.7	J	68		2.3	J	607	
ZINC	60	81.4		60	U	33.8	J	60	U	60	J

See SDG MA31G3 for ICP-MS results.

DATA SUMMARY TABLE
Tier II Validated Data
Total Metals Analysis
Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH
CASE NO.: 39067 SDG NO.: MA31G1

Sample Name:		MA31H1	MA31H3	MA31H5	MA31H7	MA31H9
Sample Location:		MW-8	MW-15	MW-24B2	MW-23B	
Lab Sample ID:		9283008006	9283008007	9283008008	9283008009	9283008010
Station ID:		MW-8-1007-1600	MW-15-1007-1600	MW-24B2-1007-1510	MW-23B-1007-1620	EB-01-1007-1700
Dilution Factor:		1/20 Hg	1	1	1	1
Sample Date:		07 Oct 09	07 Oct 09	07 Oct 09	07 Oct 09	07 Oct 09
Date Fe,Mg,Mn Analyzed:		23 Oct 09	23 Oct 09	23 Oct 09	23 Oct 09	23 Oct 09
Date Hg Analyzed:		28 Oct 09	28 Oct 09	28 Oct 09	28 Oct 09	28 Oct 09
Date Analyzed:		21 Oct 09	21 Oct 09	21 Oct 09	21 Oct 09	21 Oct 09
Chemical	CRQL					
ALUMINIUM	200	344	1300	1390	200	U
ARSENIC	10	10	U	44.4	10	U
BARIUM	200	14	J	5.3	J	30.5
CADMIUM	5	1.7	J	1.8	J	5
CALCIUM	5000	2870	J	7290	23500	22000
CHROMIUM	10	7	J	10	U	7.5
COBALT	50	50	UJ	50	UJ	50
COPPER	25	67.6		81.2		72.1
IRON	100	1230		103		792
LEAD	10	31		11.6		2.9
MAGNESIUM	5000	206	J	5000	U	111
MANGANESE	15	61.6	J	7.1	J	18.3
MERCURY	0.2	115		9.9		1.5
NICKEL	40	40	U	4.5	J	4.4
POTASSIUM	5000	4510	J	15900		60300
SELENIUM	35	35	UJ	10.4	J	35
SILVER	10	4	J	2.4	J	1.5
SODIUM	5000	891000	J	1630000	J	503000
VANADIUM	50	32.8	J	116		17.6
ZINC	60	68.3		60	U	104

See SDG MA31G3 for ICP-MS results.

DATA SUMMARY TABLE
Tier II Validated Data
Total Metals Analysis
Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH
CASE NO.: 39067 SDG NO.: MA31G1

Sample Name:		MA31J2		MA31J4		MA31J6		MA31J8		MA31K0	
Sample Location:		MW-24B2		MW-17		MW-13A		MW-13A		MW-7	
Lab Sample ID:		9284001001		9284001002		9284001005		9284001006		9284001007	
Station ID:		MW-24B2-1008-0920		MW-17-1008-0950		MW-13A-1008-1055		DUP-02-1008-1055A		MW-7-1008-1205	
Dilution Factor:		1		1		1		1		1/5 Hg	
Sample Date:		08 Oct 09		08 Oct 09		08 Oct 09		08 Oct 09		08 Oct 09	
Date Fe,Mg,Mn Analyzed:		23 Oct 09		23 Oct 09		23 Oct 09		23 Oct 09		27 Oct 09	
Date Hg Analyzed:		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09	
Date Analyzed:		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09	
Chemical	CRQL										
ALUMINUM	200	698		950		240		200	U	707	
ARSENIC	10	13.7		10	U	10	U	10	U	14.5	
BARIUM	200	41.5	J	58.4	J	72.8	J	64.3	J	59.8	J
CADMIUM	5	5	U	5	U	5	U	5	U	2	J
CALCIUM	5000	26700		10900		46200		45700		3740	J
CHROMIUM	10	5.3	J	10	U	10	U	10	U	8.5	J
COBALT	50	50	UJ	50	UJ	50	UJ	50	UJ	50	UJ
COPPER	25	155		25	U	25	U	25	U	114	
IRON	100	431		4660		7890		7490		2830	
LEAD	10	6.9	J	28.1		10	U	10	U	49.8	
MAGNESIUM	5000	75.7	J	1350	J	4760	J	4690	J	52.6	J
MANGANESE	15	8	J	185	J	1080		1080		169	J
MERCURY	0.2	9.2		0.4		4		3.2		40.1	
NICKEL	40	6.3	J	40	U	40	U	40	U	40	U
POTASSIUM	5000	58500		5000	U	5300		5030		5000	U
SELENIUM	35	35	UJ	35	UJ	35	UJ	35	UJ	7.7	J
SILVER	10	2.9	J	10	U	10	U	0.38	J	4.9	J
SODIUM	5000	1690000	J	3500	J	31200	J	30700	J	1370000	J
VANADIUM	50	66.8		3.2	J	50	U	50	U	54.3	
ZINC	60	31	J	60	U	60	U	60	U	60	U

See SDG MA31G3 for ICP-MS results.

DATA SUMMARY TABLE
Tier II Validated Data
Total Metals Analysis
Aqueous - ug/L

SITE: Chlor-Alkali Facility (Former) - Berlin, NH
CASE NO.: 39067 SDG NO.: MA31G1

Sample Name:		MA31K2		MA31K4		MA31K6		MA31L3		MA31L5	
Sample Location:		MW-24B2		MW-13B		MW-18A		MW-2		MW-26B1	
Lab Sample ID:		9284001008		9284001009		9284001010		9284001014		9284001015	
Station ID:		MW-24B2-1008-1450		MW-13B-1008-1515		MW-18A-1008-1535		MW-2-1008-1445		MW-26B1-1009-0830	
Dilution Factor:		1/10 Hg		1		1		1		1/20 Hg	
Sample Date:		08 Oct 09		08 Oct 09		08 Oct 09		08 Oct 09		09 Oct 09	
Date Fe,Mg,Mn Analyzed:		27 Oct 09		27 Oct 09		27 Oct 09		27 Oct 09		27 Oct 09	
Date Hg Analyzed:		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09		28 Oct 09	
Date Analyzed:		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09		21 Oct 09	
Chemical	CRQL										
ALUMINUM	200	581		200	U	2020		345		733	
ARSENIC	10	51.8		10	U	10	U	10.2	U	13.4	
BARIUM	200	35.5	J	425		208		15.8	J	20.4	J
CADMIUM	5	5	U	5	U	5	U	5	U	1.1	J
CALCIUM	5000	10400		116000		5	U	5540		13500	
CHROMIUM	10	7.6	J	10	U	10	U	10	U	13	
COBALT	50	50	UJ	50	UJ	50	UJ	50	UJ	50	UJ
COPPER	25	232		25	U	25	U	25	U	143	
IRON	100	800		4220		22200		1090		1530	
LEAD	10	24.4		10	U	10	U	7.7	J	41.6	
MAGNESIUM	5000	103	J	11200		3020	J	83	J	96.8	J
MANGANESE	15	17	J	214	J	1450		45.4	J	66.7	J
MERCURY	0.2	60.8		0.14	J	0.11	J	12.8		114	
NICKEL	40	10.1	J	40	U	40	U	40	U	40	U
POTASSIUM	5000	20800		12200		9230		5000	U	8460	
SELENIUM	35	15.2	J	35	UJ	35	UJ	35	UJ	35	UJ
SILVER	10	8.9	J	0.46	J	10	U	10	U	10	
SODIUM	5000	7520000	J	1280000	J	4230	J	262000	J	845000	J
VANADIUM	50	229		4.6	J	6.6	J	8.5	J	67.4	
ZINC	60	60	U	151		60	U	60	U	72	

See SDG MA31G3 for ICP-MS results.