ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 19, 2018

TO: Valeriy Bizyayev, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Inorganic Data Quality Assurance Review, Queen Anne Lead Paint Response Site, Seattle, Washington**

REF: TO: TO-21-T2-SS10 PAN: 1004530.0021.011.02

The data quality assurance review of 2 paint chip samples collected from the Queen Anne Lead Paint Response site in Seattle, Washington, has been completed. Target Analyte List (TAL) metals analyses (EPA Methods 6010c and 7471A) were performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020600 18020601

Data Qualifications:

1. Sample Holding Times: Satisfactory.

The samples were received at 21.1°C, above the mercury QC limits of < 6°C. No qualifications were applied as the samples were delivered to the laboratory within two hours of collection. The samples were collected on February 15, 2018, and were analyzed by February 16, 2018, therefore meeting QC criteria of less than 6 months between collection, extraction, and analysis (28 days for mercury).

2. Initial and Continuing Calibration: Acceptable.

A minimum of one calibration standard and a blank were analyzed at the beginning of the ICP analysis sequence and after every 10 samples. No results were greater than 110% of the highest calibration standard. All ICP recoveries were within the QC limits. All AA recoveries were within QC limits and the initial calibration correlation coefficient was > 0.995.

3. Blanks: Satisfactory.

A preparation blank was analyzed for each 20 samples or per matrix per concentration level. Blanks were analyzed after each Initial or Continuing Calibration Verification. There were no detections in any blanks except chromium (0.0036 mg/L), selenium (0.0183 mg/L), and thallium (0.0046 mg/L) in the Initial Calibration Blank (ICB), antimony (0.0034 mg/L) and selenium (0.0086 mg/L) in continuing calibration blank (CCB) 1, and arsenic (0.0047 mg/L) and selenium (0.0062 mg/L) in CCB2. Associated sample results were qualified as not detected (U) if the sample result was less than five times the positive blank concentration.

USEPA SF
1524234

4. ICP Interference Check Sample: Acceptable.

An Interference Check Sample (ICS) was analyzed at the beginning of each sequence. All applicable ICS (solution AB) results were within QC limits of 80% - 120% recovery.

5. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

6. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

7. Duplicate Analysis: Acceptable.

A laboratory spike duplicate analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits.

8. Laboratory Control Sample (LCS) and LCS Duplicate (LCSD) Analysis: Acceptable.

Laboratory Control Sample (LCS) and LCSD analyses were performed per SDG per matrix. All LCS and LCSD results were within the established control limits.

9. Overall Assessment of Data for Use

A total of 46 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No sample results were rejected (R). The following potential contaminants of concern were detected in the laboratory blanks: chromium, selenium, thallium, antimony, arsenic.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

<u>Data Qualifiers and Definitions</u>

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 18020600 | Lab Sample ID: 580-75143-1

Lab Name: TestAmerica Seattle | Job No.: 580-75143-1

SDG ID.:

Matrix: Solid | Date Sampled: 02/15/2018 14:40

Reporting Basis: WET | Date Received: 02/15/2018 16:45

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	1000	160	21	mg/Kg			1	6010C
7440-36-0	Antimony	1200	6.4	0.41	mg/Kg			1	6010C
7440-38-2	Arsenic	~~ND~~	640 U	43	mg/Kg			100	6010C
7440-39-3	Barium	340	1.1	0.17	mg/Kg			1	6010C
7440-41-7	Beryllium	~~ND~~	2.1 U	0.032	mg/Kg			1	6010C
7440-43-9	Cadmium	8.9	2.1	0.11	mg/Kg			1	6010C
7440-70-2	Calcium	3000	120	21	mg/Kg			1	6010C
7440-47-3	Chromium	19000	280	8.2	mg/Kg			100	6010C
7440-48-4	Cobalt	15	2.1	0.054	mg/Kg			1	6010C
7440-50-8	Copper	110	5.4	0.86	mg/Kg			1	6010C
7439-89-6	Iron	19000	140	33	mg/Kg			1	6010C
7439-92-1	Lead	34000	320	48	mg/Kg			100	6010C
7439-95-4	Magnesium	320	120	17	mg/Kg			1	6010C
7439-96-5	Manganese	78	4.3	0.82	mg/Kg			1	6010C
7440-02-0	Nickel	9.1	2.1	0.22	mg/Kg			1	6010C
7440-09-7	Potassium	140	350	15	mg/Kg	J Q		1	6010C
7782-49-2	Selenium	~~ND~~	11 U	0.43	mg/Kg			1	6010C
7440-22-4	Silver	~~ND~~	5.4 U	1.2	mg/Kg			1	6010C
7440-23-5	Sodium	510	210	32	mg/Kg			1	6010C
7440-28-0	Thallium	4.8	11	0.90	mg/Kg	J Q		1	6010C
7440-62-2	Vanadium	58	4.3	0.56	mg/Kg			1	6010C
7440-66-6	Zinc	53000	860	200	mg/Kg			100	6010C
7439-97-6	Mercury	0.045	0.11	0.033	mg/Kg	J Q		1	7471A

2/19/18

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 18020601

Lab Sample ID: 580-75143-2

Lab Name: TestAmerica Seattle

Job No.: 580-75143-1

SDG ID.:

Matrix: Solid

Date Sampled: 02/15/2018 14:43

Reporting Basis: WET

Date Received: 02/15/2018 16:45

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	2100	58	7.6	mg/Kg			1	6010C
7440-36-0	Antimony	240	2.3	0.15	mg/Kg			1	6010C
7440-38-2	Arsenic	~~0.77~~	2.3 U	0.15	mg/Kg			1	6010C
7440-39-3	Barium	15	0.38	0.061	mg/Kg			1	6010C
7440-41-7	Beryllium	~~ND~~	0.77 U	0.012	mg/Kg			1	6010C
7440-43-9	Cadmium	3.5	0.77	0.038	mg/Kg			1	6010C
7440-70-2	Calcium	6800	42	7.7	mg/Kg			1	6010C
7440-47-3	Chromium	3400	100	2.9	mg/Kg			100	6010C
7440-48-4	Cobalt	17	0.77	0.019	mg/Kg			1	6010C
7440-50-8	Copper	29	1.9	0.31	mg/Kg			1	6010C
7439-89-6	Iron	8700	50	12	mg/Kg			1	6010C
7439-92-1	Lead	5600	120	17	mg/Kg			100	6010C
7439-95-4	Magnesium	610	42	6.1	mg/Kg			1	6010C
7439-96-5	Manganese	67	1.5	0.29	mg/Kg			1	6010C
7440-02-0	Nickel	4.1	0.77	0.079	mg/Kg			1	6010C
7440-09-7	Potassium	52	130	5.2	mg/Kg	J Q		1	6010C
7782-49-2	Selenium	~~ND~~	3.8 U	0.15	mg/Kg			1	6010C
7440-22-4	Silver	~~ND~~	1.9 U	0.43	mg/Kg			1	6010C
7440-23-5	Sodium	440	77	11	mg/Kg			1	6010C
7440-28-0	Thallium	~~0.75~~	3.8 U	0.32	mg/Kg			1	6010C
7440-62-2	Vanadium	12	1.5	0.20	mg/Kg			1	6010C
7440-66-6	Zinc	49000	310	73	mg/Kg			100	6010C
7439-97-6	Mercury	0.041	0.029	0.0086	mg/Kg			1	7471A

JMW 2-19-18

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Analysis Report

Total Lead (Pb)

Client: Building Envelope Technology & Research
Address: 4000 Delridge Way SW, First Floor
Seattle, WA 98106

Attention: Mr. John Vik
Project Location: N-A

Batch #: 1802842.00
Matrix: Paint
Method: EPA 3051/7000B
Client Project #: Kiro Tower
Date Received: 2/13/2018
Samples Received: 1
Samples Analyzed: 1

Lab ID	Client Sample #	Sample Weight	RL in mg/Kg	Results in mg/Kg	Results in percent
18013583	Paint Chip 1	0.2034	49	42000	4.2

Sampled by: Client
Analyzed by: Aaron Brown Date Analyzed: 02/13/2018

DRAFT

mg/ Kg =Milligrams per kilogram
Percent = Milligrams per kilogram / 10000
RL = Reporting Limit
'<' = Below the reporting Limit
Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

LEAD LABORATORY SERVICES

NVL LABS

Company Building Envelope Technology & Research
Address 4000 Delridge Way SW, First Floor
Seattle, WA 98106
Project Manager Mr. John Vik
Phone (206) 405-3455

NVL Batch Number **1802842.00**
TAT 1 Day **AH** No
Rush TAT
Due Date 2/14/2018 **Time** 2:05 PM
Email jvik@bet-r.com
Fax (206) 405-3458

Project Name/Number: Kiro Tower **Project Location:** N-A

Subcategory Flame AA (FAA)
Item Code FAA-02 EPA 7000B Lead by FAA <paint>

Total Number of Samples 1 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	18013583	Paint Chip 1		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Umer Khan		NVL	2/13/18	1405
Analyzed by	Aaron Brown		NVL	2/13/18	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/13/2018
Time: 1:06 PM
Entered By: Umer Khan

LEAD LABORATORY SERVICES

NVL LABS

Company Building Envelope Technology & Research
Address 4000 Delridge Way SW, First Floor
Seattle, WA 98106
Project Manager Mr. John Vik
Phone (206) 405-3455

NVL Batch Number **1802842.00**
TAT 1 Day **AH** No
Rush TAT
Due Date 2/14/2018 **Time** 2:05 PM
Email jvik@bet-r.com
Fax (206) 405-3458

Project Name/Number: Kiro Tower **Project Location:** N-A

Subcategory Flame AA (FAA)
Item Code FAA-02 **Method** EPA 7000B Lead by FAA <paint>

Total Number of Samples 1 Rush Samples _____

	Lab ID	Sample ID	Description	A/R
1	18013583	Paint Chip 1		A

PAID
CC UK 2/13/18

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Umer Khan		NVL	2/13/18	1405
Analyzed by			NVL		
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Entered By: Umer Khan Date: 2/13/2018 Time: 1:06 PM 1 of 1