

Chemical Analysis Report

NE-DIST-2021-12-21-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Nassau North 2 Makeup**
Request ID: **RQ-2021-12-13-53**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 06-JAN-2022 13:13

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Metals.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Mills Creek at US 301/US1

Collection Date/Time: 12/20/2021 12:20

Field ID: 19020048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2296502	EPA 200.7 Rev. 4.4	Calcium	4.73		mg/L	P407790	
		Iron	1.64E+03		ug/L	P407790	
		Magnesium	1.62		mg/L	P407790	
		Potassium	2.2		mg/L	P407790	
		Sodium	8.7		mg/L	P407790	
		Strontium	23.1		ug/L	P407790	
		Tin	3.0	U	ug/L	P407790	
		Titanium	1.0	I	ug/L	P407790	
		Vanadium	2.0	U	ug/L	P407790	
		Zinc	5.0	U	ug/L	P407790	
	EPA 200.8 Rev. 5.4	Aluminum	474		ug/L	P407790	
		Antimony	0.050	U	ug/L	P407790	
		Arsenic	0.55		ug/L	P407790	
		Barium	19.7		ug/L	P407790	
		Beryllium	0.031	I	ug/L	P407790	
		Boron**	25.0		ug/L	P407790	
		Cadmium	0.020	U	ug/L	P407790	
		Chromium	0.60	I	ug/L	P407790	
		Cobalt	0.368		ug/L	P407790	
		Copper	0.40	U	ug/L	P407790	
		Lead	0.60		ug/L	P407790	
		Manganese	23.7		ug/L	P407790	
		Molybdenum	0.15	U	ug/L	P407790	
		Nickel	0.59	I	ug/L	P407790	
		Selenium	0.20	U	ug/L	P407790	
		Silver	0.010	U	ug/L	P407790	
		Thallium	0.10	U	ug/L	P407790	
	SM 2340B	Hardness	18.5		mg/L	P407790	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 01/04/2022.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P407790

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P407790

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P407790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Strontium	102		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P407790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Barium	107		P	85 - 115
Beryllium	97.6		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	103		P	85 - 115
Cobalt	108		P	85 - 115
Copper	102		P	85 - 115
Lead	98.2		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	103		P	85 - 115
Nickel	104		P	85 - 115
Selenium	104		P	85 - 115
Silver	107		P	85 - 115
Thallium	99.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P407790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296447	Calcium	98.8		P	80 - 120
2296447	Iron	104		P	80 - 120
2296447	Magnesium	99.2		P	80 - 120
2296447	Potassium	103		P	80 - 120
2296447	Sodium	99.5		P	80 - 120
2296447	Strontium	99.6		P	80 - 120
2296447	Tin	98.0		P	80 - 120
2296447	Titanium	101		P	80 - 120
2296447	Vanadium	102		P	80 - 120
2296447	Zinc	102		P	80 - 120
2296531	Calcium	99.7	103	P/P	80 - 120
2296531	Iron	103	106	P/P	80 - 120
2296531	Magnesium	100	105	P/P	80 - 120
2296531	Potassium	109	111	P/P	80 - 120
2296531	Sodium	104	103	P/P	80 - 120
2296531	Strontium	101	101	P/P	80 - 120
2296531	Tin	104	104	P/P	80 - 120
2296531	Titanium	102	103	P/P	80 - 120
2296531	Vanadium	101	102	P/P	80 - 120
2296531	Zinc	104	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P407790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296447	Aluminum	104		P	80 - 120
2296447	Antimony	105		P	80 - 120
2296447	Arsenic	102		P	80 - 120
2296447	Barium	110		P	80 - 120
2296447	Beryllium	95.3		P	80 - 120
2296447	Boron	103		P	80 - 120
2296447	Cadmium	104		P	80 - 120
2296447	Chromium	105		P	80 - 120
2296447	Cobalt	106		P	80 - 120
2296447	Copper	101		P	80 - 120
2296447	Lead	98.6		P	80 - 120
2296447	Manganese	104		P	80 - 120
2296447	Molybdenum	108		P	80 - 120
2296447	Nickel	101		P	80 - 120
2296447	Selenium	101		P	80 - 120
2296447	Silver	107		P	80 - 120
2296447	Thallium	101		P	80 - 120
2296531	Aluminum	105	103	P/P	80 - 120
2296531	Antimony	103	103	P/P	80 - 120
2296531	Arsenic	103	102	P/P	80 - 120
2296531	Barium	110	109	P/P	80 - 120
2296531	Beryllium	96.6	96.4	P/P	80 - 120
2296531	Boron	103	101	P/P	80 - 120
2296531	Cadmium	102	102	P/P	80 - 120
2296531	Chromium	104	104	P/P	80 - 120
2296531	Cobalt	107	108	P/P	80 - 120
2296531	Copper	106	105	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296531	Lead	101	100	P/P	80 - 120
2296531	Manganese	102	102	P/P	80 - 120
2296531	Molybdenum	105	105	P/P	80 - 120
2296531	Nickel	105	105	P/P	80 - 120
2296531	Selenium	103	104	P/P	80 - 120
2296531	Silver	107	107	P/P	80 - 120
2296531	Thallium	102	103	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P407790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296531	Calcium	3.09	Spike	P	0 - 20
2296531	Iron	3.00	Spike	P	0 - 20
2296531	Magnesium	3.74	Spike	P	0 - 20
2296531	Potassium	1.43	Spike	P	0 - 20
2296531	Sodium	0.354	Spike	P	0 - 20
2296531	Strontium	0.262	Spike	P	0 - 20
2296531	Tin	0.156	Spike	P	0 - 20
2296531	Titanium	0.814	Spike	P	0 - 20
2296531	Vanadium	0.407	Spike	P	0 - 20
2296531	Zinc	1.25	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P407790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296531	Aluminum	1.69	Spike	P	0 - 20
2296531	Antimony	0.126	Spike	P	0 - 20
2296531	Arsenic	0.426	Spike	P	0 - 20
2296531	Barium	0.615	Spike	P	0 - 20
2296531	Beryllium	0.255	Spike	P	0 - 20
2296531	Boron	1.27	Spike	P	0 - 20
2296531	Cadmium	0.0844	Spike	P	0 - 20
2296531	Chromium	0.427	Spike	P	0 - 20
2296531	Cobalt	0.712	Spike	P	0 - 20
2296531	Copper	0.537	Spike	P	0 - 20
2296531	Lead	0.604	Spike	P	0 - 20
2296531	Manganese	0.382	Spike	P	0 - 20
2296531	Molybdenum	0.367	Spike	P	0 - 20
2296531	Nickel	0.438	Spike	P	0 - 20
2296531	Selenium	0.734	Spike	P	0 - 20
2296531	Silver	0.470	Spike	P	0 - 20
2296531	Thallium	1.43	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A109575

Included Lab Sample IDs: 2296502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.9	97.0	P/P	90 - 110
Iron	98.7	98.1	P/P	90 - 110
Magnesium	98.0	97.3	P/P	90 - 110
Potassium	98.3	98.4	P/P	90 - 110
Sodium	97.8	97.8	P/P	90 - 110
Strontium	101	100	P/P	90 - 110
Tin	100	97.8	P/P	90 - 110
Titanium	96.4	93.9	P/P	90 - 110
Vanadium	96.8	95.7	P/P	90 - 110
Zinc	100	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109624

Included Lab Sample IDs: 2296502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Antimony	100	99.3	P/P	90 - 110
Arsenic	100	100	P/P	90 - 110
Barium	101	100	P/P	90 - 110
Beryllium	96.2	94.4	P/P	90 - 110
Boron	99.8	99.6	P/P	90 - 110
Cadmium	99.5	100	P/P	90 - 110
Chromium	97.9	96.7	P/P	90 - 110
Cobalt	101	99.5	P/P	90 - 110
Manganese	97.8	97.5	P/P	90 - 110
Molybdenum	99.6	98.6	P/P	90 - 110
Nickel	97.9	96.9	P/P	90 - 110
Selenium	100	98.9	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Thallium	109	107	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109643

Included Lab Sample IDs: 2296502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	100	98.0	P/P	90 - 110
Lead	93.2	93.7	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Calcium	107	98.8	99.7	103		3.09
	Iron	108	104	103	106		3.00
	Magnesium	107	99.2	100	105		3.74
	Potassium	106	103	109	111		1.43
	Sodium	105	99.5	104	103		0.354
	Strontium	102	99.6	101	101		0.262
	Tin	104	98.0	104	104		0.156
	Titanium	103	101	102	103		0.814
	Vanadium	102	102	101	102		0.407
	Zinc	104	102	104	105		1.25
EPA 200.8 Rev. 5.4	Aluminum	102	105	103	104		1.69
	Antimony	102	103	103	105		0.126
	Arsenic	102	103	102	102		0.426
	Barium	107	110	109	110		0.615
	Beryllium	97.6	96.6	96.4	95.3		0.255
	Boron	98.6	103	101	103		1.27
	Cadmium	101	102	102	104		0.0844
	Chromium	103	104	104	105		0.427
	Cobalt	108	107	108	106		0.712
	Copper	102	106	105	101		0.537
	Lead	98.2	101	100	98.6		0.604
	Manganese	102	102	102	104		0.382
	Molybdenum	103	105	105	108		0.367
	Nickel	104	105	105	101		0.438
	Selenium	104	103	104	101		0.734
	Silver	107	107	107	107		0.470
	Thallium	99.8	102	103	101		1.43

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2296502
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2296502
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2296502

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	12/28/2021 03:12	Josef B Mick	2296502
EPA 200.8 Rev. 5.4	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	01/03/2022 17:42	Alexander Thompson	2296502
	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	12/29/2021 17:22	McKinley C Carter	2296502
SM 2340B	12/21/2021			12/28/2021 03:12	Josef B Mick	2296502