

Chemical Analysis Report

SE-DIST-2023-09-12-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

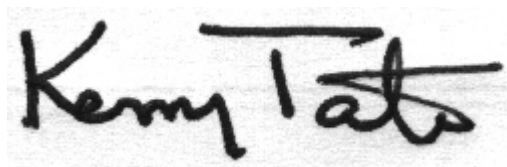
Event Description: **SMP - PSL Boat**
Request ID: **RQ-2023-09-04-30**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Andrew Luering

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 20-SEP-2023 08:53

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the 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: NORTH FORK ST LUCIE RIVER NORTH OF
 PORT ST LUCIE BLVD**

Collection Date/Time: 09/11/2023 11:00

Field ID: G2SE0070

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2435982	EPA 200.7 Rev. 4.4	Calcium	95.3		mg/L	P434907	
		Iron	170		ug/L	P434907	
		Magnesium	69.9		mg/L	P434907	
		Potassium	19.5		mg/L	P434907	
		Sodium	528		mg/L	P434907	
		Strontium	3.04E+03		ug/L	P434907	
		Tin	3.0	U	ug/L	P434907	
		Titanium	1.3	I	ug/L	P434907	
		Vanadium	2.0	U	ug/L	P434907	
		Zinc	5.0	U	ug/L	P434907	
	EPA 200.8 Rev. 5.4	Aluminum	81		ug/L	P434907	
		Antimony	0.11	I	ug/L	P434907	
		Arsenic	1.66		ug/L	P434907	
		Barium	33.5		ug/L	P434907	
		Beryllium	0.010	U	ug/L	P434907	
		Boron	231		ug/L	P434907	
		Cadmium	0.020	U	ug/L	P434907	
		Chromium	0.40	U	ug/L	P434907	
		Cobalt	0.067	I	ug/L	P434907	
		Copper	1.25		ug/L	P434907	
		Lead	0.20	U	ug/L	P434907	
		Manganese	14.1		ug/L	P434907	
		Molybdenum	2.61		ug/L	P434907	
		Nickel	0.50	U	ug/L	P434907	
		Selenium	0.20	U	ug/L	P434907	
		Silver	0.010	U	ug/L	P434907	
		Thallium	0.10	U	ug/L	P434907	
	SM 2340 B-2011	Hardness	526		mg/L	P434907	

Sample Location: NORTH FORK ST LUCIE RIVER PRIMA VISTA BLVD **Collection Date/Time: 09/11/2023 10:25**

Field ID: G2SE0071

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2435983	EPA 200.7 Rev. 4.4	Calcium	101		mg/L	P434907	
		Iron	510		ug/L	P434907	
		Magnesium	26.5		mg/L	P434907	
		Potassium	5.7		mg/L	P434907	
		Sodium	149		mg/L	P434907	
		Strontium	3.83E+03		ug/L	P434907	
		Tin	3.0	U	ug/L	P434907	
		Titanium	2.9	I	ug/L	P434907	
		Vanadium	2.0	U	ug/L	P434907	
		Zinc	5.0	U	ug/L	P434907	
	EPA 200.8 Rev. 5.4	Aluminum	237		ug/L	P434907	
		Antimony	0.093	I	ug/L	P434907	
		Arsenic	1.64		ug/L	P434907	
		Barium	43.4		ug/L	P434907	
		Beryllium	0.013	I	ug/L	P434907	
		Boron	87.6		ug/L	P434907	
		Cadmium	0.020	U	ug/L	P434907	
		Chromium	0.60	I	ug/L	P434907	
		Cobalt	0.085		ug/L	P434907	
		Copper	1.92		ug/L	P434907	
	SM 2340 B-2011	Lead	0.30	I	ug/L	P434907	
		Manganese	20.6		ug/L	P434907	
		Molybdenum	2.39		ug/L	P434907	
		Nickel	0.50	U	ug/L	P434907	
		Selenium	0.20	U	ug/L	P434907	
		Silver	0.010	U	ug/L	P434907	
		Thallium	0.10	U	ug/L	P434907	
		Hardness	362		mg/L	P434907	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P434907

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: P434907

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: P434907

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	103		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	101		P	85 - 115
Sodium	103		P	85 - 115
Strontium	100		P	85 - 115
Tin	97.6		P	85 - 115
Titanium	96.8		P	85 - 115
Vanadium	98.9		P	85 - 115
Zinc	99.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434907

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.2		P	85 - 115
Antimony	96.8		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	96.4		P	85 - 115
Boron	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	98.1		P	85 - 115
Cobalt	100		P	85 - 115
Copper	99.6		P	85 - 115
Lead	94.1		P	85 - 115
Manganese	98.0		P	85 - 115
Molybdenum	97.6		P	85 - 115
Nickel	100		P	85 - 115
Selenium	100		P	85 - 115
Silver	110		P	85 - 115
Thallium	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P434907

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2435812	Calcium	98.9	98.7	P/P	80 - 120
2435812	Iron	100	100	P/P	80 - 120
2435812	Magnesium	100	100	P/P	80 - 120
2435812	Potassium	97.3	97.2	P/P	80 - 120
2435812	Sodium	100	98.1	P/P	80 - 120
2435812	Strontium	98.3	98.0	P/P	80 - 120
2435812	Tin	98.1	98.9	P/P	80 - 120
2435812	Titanium	92.2	90.6	P/P	80 - 120
2435812	Vanadium	99.2	98.8	P/P	80 - 120
2435812	Zinc	98.7	98.2	P/P	80 - 120
2435897	Calcium	101		P	80 - 120
2435897	Iron	106		P	80 - 120
2435897	Magnesium	105		P	80 - 120
2435897	Potassium	100		P	80 - 120
2435897	Sodium	101		P	80 - 120
2435897	Strontium	102		P	80 - 120
2435897	Tin	103		P	80 - 120
2435897	Titanium	100		P	80 - 120
2435897	Vanadium	104		P	80 - 120
2435897	Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434907

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2435812	Aluminum	101	98.6	P/P	80 - 120
2435812	Antimony	94.2	95.1	P/P	80 - 120
2435812	Arsenic	100	101	P/P	80 - 120
2435812	Barium	102	102	P/P	80 - 120
2435812	Beryllium	97.5	98.1	P/P	80 - 120
2435812	Boron	102	101	P/P	80 - 120
2435812	Cadmium	99.9	98.9	P/P	80 - 120
2435812	Chromium	97.2	97.2	P/P	80 - 120
2435812	Cobalt	101	101	P/P	80 - 120
2435812	Copper	101	102	P/P	80 - 120
2435812	Lead	94.6	95.2	P/P	80 - 120
2435812	Manganese	97.4	96.0	P/P	80 - 120
2435812	Molybdenum	99.2	98.9	P/P	80 - 120
2435812	Nickel	101	102	P/P	80 - 120
2435812	Selenium	97.9	99.4	P/P	80 - 120
2435812	Silver	109	109	P/P	80 - 120
2435812	Thallium	103	104	P/P	80 - 120
2435897	Aluminum	96.4		P	80 - 120
2435897	Antimony	96.9		P	80 - 120
2435897	Arsenic	98.3		P	80 - 120
2435897	Barium	98.6		P	80 - 120
2435897	Beryllium	98.7		P	80 - 120
2435897	Boron	102		P	80 - 120
2435897	Cadmium	101		P	80 - 120
2435897	Chromium	98.2		P	80 - 120
2435897	Cobalt	96.3		P	80 - 120
2435897	Copper	97.0		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434907

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2435897	Lead	94.2		P	80 - 120
2435897	Manganese	98.0		P	80 - 120
2435897	Molybdenum	98.8		P	80 - 120
2435897	Nickel	95.0		P	80 - 120
2435897	Selenium	96.7		P	80 - 120
2435897	Silver	107		P	80 - 120
2435897	Thallium	102		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P434907

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2435812	Calcium	0.114	Spike	P	0 - 20
2435812	Iron	0.00180	Spike	P	0 - 20
2435812	Magnesium	0.109	Spike	P	0 - 20
2435812	Potassium	0.0983	Spike	P	0 - 20
2435812	Sodium	1.14	Spike	P	0 - 20
2435812	Strontium	0.284	Spike	P	0 - 20
2435812	Tin	0.783	Spike	P	0 - 20
2435812	Titanium	1.47	Spike	P	0 - 20
2435812	Vanadium	0.401	Spike	P	0 - 20
2435812	Zinc	0.496	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434907

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2435812	Aluminum	1.94	Spike	P	0 - 20
2435812	Antimony	0.924	Spike	P	0 - 20
2435812	Arsenic	0.741	Spike	P	0 - 20
2435812	Barium	0.0813	Spike	P	0 - 20
2435812	Beryllium	0.578	Spike	P	0 - 20
2435812	Boron	0.855	Spike	P	0 - 20
2435812	Cadmium	0.989	Spike	P	0 - 20
2435812	Chromium	0.0550	Spike	P	0 - 20
2435812	Cobalt	0.286	Spike	P	0 - 20
2435812	Copper	0.338	Spike	P	0 - 20
2435812	Lead	0.635	Spike	P	0 - 20
2435812	Manganese	0.857	Spike	P	0 - 20
2435812	Molybdenum	0.321	Spike	P	0 - 20
2435812	Nickel	0.343	Spike	P	0 - 20
2435812	Selenium	1.50	Spike	P	0 - 20
2435812	Silver	0.200	Spike	P	0 - 20
2435812	Thallium	0.842	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121551

Included Lab Sample IDs: 2435982, 2435983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.6	96.2	P/P	90 - 110
Antimony	93.1	93.6	P/P	90 - 110
Arsenic	102	96.4	P/P	90 - 110
Barium	98.2	96.3	P/P	90 - 110
Boron	97.0	98.4	P/P	90 - 110
Cadmium	98.8	100	P/P	90 - 110
Chromium	98.6	101	P/P	90 - 110
Cobalt	101	96.3	P/P	90 - 110
Copper	100	94.7	P/P	90 - 110
Lead	93.2	92.8	P/P	90 - 110
Manganese	97.7	99.8	P/P	90 - 110
Molybdenum	97.2	96.3	P/P	90 - 110
Nickel	101	95.5	P/P	90 - 110
Selenium	100	97.7	P/P	90 - 110
Silver	98.7	99.1	P/P	90 - 110
Thallium	98.1	98.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A121555

Included Lab Sample IDs: 2435982, 2435983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	106	94.1	P/P	90 - 110
Iron	109	98.3	P/P	90 - 110
Magnesium	108	97.8	P/P	90 - 110
Potassium	103	94.9	P/P	90 - 110
Sodium	104	94.0	P/P	90 - 110
Strontium	99.4	95.0	P/P	90 - 110
Tin	96.3	93.1	P/P	90 - 110
Titanium	96.9	92.9	P/P	90 - 110
Vanadium	97.1	93.0	P/P	90 - 110
Zinc	97.8	93.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121586

Included Lab Sample IDs: 2435982, 2435983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	100	99.3	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	101	98.9	98.7	101		0.114
	Iron	103	100	100	106		0.0018
	Magnesium	104	100	100	105		0.109
	Potassium	101	97.3	97.2	100		0.0983
	Sodium	103	100	98.1	101		1.14
	Strontium	100	98.3	98.0	102		0.284
	Tin	97.6	98.1	98.9	103		0.783
	Titanium	96.8	92.2	90.6	100		1.47
	Vanadium	98.9	99.2	98.8	104		0.401
	Zinc	99.4	98.7	98.2	106		0.496
EPA 200.8 Rev. 5.4	Aluminum	98.2	101	98.6	96.4		1.94
	Antimony	96.8	94.2	95.1	96.9		0.924
	Arsenic	101	100	101	98.3		0.741
	Barium	101	102	102	98.6		0.0813
	Beryllium	96.4	97.5	98.1	98.7		0.578
	Boron	101	102	101	102		0.855
	Cadmium	100	99.9	98.9	101		0.989
	Chromium	98.1	97.2	97.2	98.2		0.0550
	Cobalt	100	101	101	96.3		0.286
	Copper	99.6	101	102	97.0		0.338
	Lead	94.1	94.6	95.2	94.2		0.635
	Manganese	98.0	97.4	96.0	98.0		0.857
	Molybdenum	97.6	99.2	98.9	98.8		0.321
	Nickel	100	101	102	95.0		0.343
	Selenium	100	97.9	99.4	96.7		1.50
	Silver	110	109	109	107		0.200
	Thallium	102	103	104	102		0.842

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	2435982, 2435983
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2435982, 2435983
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2435982, 2435983

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	09/12/2023	09/13/2023 12:15	George D Taylor	09/14/2023 19:43	McKinley C Carter	2435982
	09/12/2023	09/13/2023 12:15	George D Taylor	09/14/2023 19:51	McKinley C Carter	2435982
	09/12/2023	09/13/2023 12:15	George D Taylor	09/14/2023 19:59	McKinley C Carter	2435983
EPA 200.8 Rev. 5.4	09/12/2023	09/13/2023 12:15	George D Taylor	09/14/2023 20:13	Emily M Philpot	2435982
	09/12/2023	09/13/2023 12:15	George D Taylor	09/14/2023 20:23	Emily M Philpot	2435983
	09/12/2023	09/13/2023 12:15	George D Taylor	09/15/2023 15:24	Emily M Philpot	2435982
	09/12/2023	09/13/2023 12:15	George D Taylor	09/15/2023 15:30	Emily M Philpot	2435983
SM 2340 B-2011	09/12/2023			09/14/2023 19:43	McKinley C Carter	2435982
	09/12/2023			09/14/2023 19:59	McKinley C Carter	2435983