Chemical Analysis Report

SO-DIST-2021-08-03-01

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

Event Description: **SMP: Myrtle Slough & Hog Bay**
Request ID: **RQ-2021-08-02-87**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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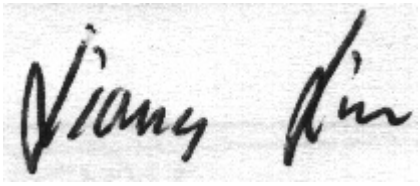
Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-AUG-2021 17:31



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: Myrtle Slough @ Bermont **Collection Date/Time: 08/02/2021 08:40**

Field ID: G3SD0181 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266597	EPA 200.7 Rev. 4.4	Barium	7.3		ug/L	P402337	
		Calcium	19.0		mg/L	P402337	
		Iron	840		ug/L	P402337	
		Magnesium	1.41		mg/L	P402337	
		Manganese	9.8		ug/L	P402337	
		Potassium	0.32	I	mg/L	P402337	
		Sodium	6.1		mg/L	P402337	
		Zinc	5.0	U	ug/L	P402337	
	EPA 200.8 Rev. 5.4	Aluminum	81		ug/L	P401881	
		Antimony	0.083	I	ug/L	P401881	
		Arsenic	0.86		ug/L	P401881	
		Beryllium	0.017	I	ug/L	P401881	
		Boron**	20.4		ug/L	P401881	
		Cadmium	0.020	U	ug/L	P401881	
		Chromium	0.51	I	ug/L	P401881	
		Copper	0.76	I	ug/L	P402337	
		Lead	0.37	I	ug/L	P401881	
		Nickel	0.50	U	ug/L	P401881	
		Selenium	0.20	U	ug/L	P401881	
		Silver	0.010	U	ug/L	P401881	
		Thallium	0.10	U	ug/L	P401881	
	SM 2340B	Hardness	53.2		mg/L	P402337	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402337

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401881

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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
Lead	0.20	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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402337

Component	Result	Code	Units
Copper	0.40	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402337

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	90.0		P	85 - 115
Calcium	95.9		P	85 - 115
Iron	98.8		P	85 - 115
Magnesium	100		P	85 - 115
Manganese	90.8		P	85 - 115
Potassium	88.8		P	85 - 115
Sodium	95.9		P	85 - 115
Zinc	88.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401881

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	103		P	85 - 115
Boron	104		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	100		P	85 - 115
Lead	105		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.0		P	85 - 115
Silver	102		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402337

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267102	Barium	94.4		P	80 - 120
2267102	Calcium	80.1		P	80 - 120
2267102	Iron	103		P	80 - 120
2267102	Magnesium	84.8		P	80 - 120
2267102	Manganese	96.2		P	80 - 120
2267102	Potassium	90.7		P	80 - 120
2267102	Sodium	82.8		P	80 - 120
2267102	Zinc	97.4		P	80 - 120
2267664	Barium	99.2	100	P/P	80 - 120
2267664	Calcium	97.2	103	P/P	80 - 120
2267664	Iron	102	104	P/P	80 - 120
2267664	Magnesium	104	105	P/P	80 - 120
2267664	Manganese	99.4	101	P/P	80 - 120
2267664	Potassium	98.2	99.0	P/P	80 - 120
2267664	Sodium	96.4	101	P/P	80 - 120
2267664	Zinc	99.3	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265970	Aluminum	118		P	80 - 120
2265970	Antimony	103		P	80 - 120
2265970	Arsenic	97.9		P	80 - 120
2265970	Beryllium	102		P	80 - 120
2265970	Boron	107		P	80 - 120
2265970	Cadmium	103		P	80 - 120
2265970	Chromium	102		P	80 - 120
2265970	Lead	100		P	80 - 120
2265970	Nickel	101		P	80 - 120
2265970	Selenium	95.3		P	80 - 120
2265970	Silver	103		P	80 - 120
2265970	Thallium	110		P	80 - 120
2266597	Aluminum	101	102	P/P	80 - 120
2266597	Antimony	104	106	P/P	80 - 120
2266597	Arsenic	97.3	98.3	P/P	80 - 120
2266597	Beryllium	98.5	98.3	P/P	80 - 120
2266597	Boron	103	105	P/P	80 - 120
2266597	Cadmium	100	102	P/P	80 - 120
2266597	Chromium	98.0	99.8	P/P	80 - 120
2266597	Lead	102	102	P/P	80 - 120
2266597	Nickel	97.8	99.3	P/P	80 - 120
2266597	Selenium	94.5	94.7	P/P	80 - 120
2266597	Silver	101	101	P/P	80 - 120
2266597	Thallium	108	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267102	Copper	100		P	80 - 120
2267664	Copper	101	102	P/P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267664	Barium	1.01	Spike	P	0 - 20
2267664	Calcium	3.47	Spike	P	0 - 20
2267664	Iron	1.40	Spike	P	0 - 20
2267664	Magnesium	0.982	Spike	P	0 - 20
2267664	Manganese	1.48	Spike	P	0 - 20
2267664	Potassium	0.903	Spike	P	0 - 20
2267664	Sodium	3.17	Spike	P	0 - 20
2267664	Zinc	1.59	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266597	Aluminum	1.19	Spike	P	0 - 20
2266597	Antimony	1.21	Spike	P	0 - 20
2266597	Arsenic	1.03	Spike	P	0 - 20
2266597	Beryllium	0.121	Spike	P	0 - 20
2266597	Boron	0.996	Spike	P	0 - 20
2266597	Cadmium	1.63	Spike	P	0 - 20
2266597	Chromium	1.78	Spike	P	0 - 20
2266597	Lead	0.0791	Spike	P	0 - 20
2266597	Nickel	1.56	Spike	P	0 - 20
2266597	Selenium	0.304	Spike	P	0 - 20
2266597	Silver	0.635	Spike	P	0 - 20
2266597	Thallium	0.523	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267664	Copper	0.870	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: A107048
Included Lab Sample IDs: 2266597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	104	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	104	102	P/P	90 - 110
Beryllium	99.6	99.0	P/P	90 - 110
Boron	101	104	P/P	90 - 110
Cadmium	103	104	P/P	90 - 110
Chromium	99.6	100	P/P	90 - 110
Nickel	103	101	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	96.3	96.8	P/P	90 - 110
Thallium	107	109	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A107070
Included Lab Sample IDs: 2266597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	102	99.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A107219
Included Lab Sample IDs: 2266597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.0	94.6	P/P	90 - 110
Calcium	104	99.2	P/P	90 - 110
Iron	103	99.3	P/P	90 - 110
Magnesium	103	99.9	P/P	90 - 110
Manganese	104	99.2	P/P	90 - 110
Potassium	99.8	95.5	P/P	90 - 110
Sodium	102	97.2	P/P	90 - 110
Zinc	104	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A107222
Included Lab Sample IDs: 2266597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.4	96.2	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		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Barium	90.0	94.4	99.2	100			1.01
	Calcium	95.9	80.1	97.2	103			3.47
	Iron	98.8	103	102	104			1.40
	Magnesium	100	84.8	104	105			0.982
	Manganese	90.8	96.2	99.4	101			1.48
	Potassium	88.8	90.7	98.2	99.0			0.903
	Sodium	95.9	82.8	96.4	101			3.17
	Zinc	88.8	97.4	99.3	101			1.59
EPA 200.8 Rev. 5.4	Aluminum	103	101	102	118			1.19
	Antimony	107	104	106	103			1.21
	Arsenic	102	97.3	98.3	97.9			1.03
	Beryllium	103	98.5	98.3	102			0.121
	Boron	104	103	105	107			0.996
	Cadmium	103	100	102	103			1.63
	Chromium	100	98.0	99.8	102			1.78
	Copper	101	101	102	100			0.870
	Lead	105	102	102	100			0.0791
	Nickel	103	97.8	99.3	101			1.56
	Selenium	99.0	94.5	94.7	95.3			0.304
	Silver	102	101	101	103			0.635
	Thallium	107	108	108	110			0.523

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	2266597
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2266597
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2266597

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	08/03/2021	08/11/2021 16:45	Elliott D. Healy	08/12/2021 13:38	Betina Topolski	2266597
EPA 200.8 Rev. 5.4	08/03/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 02:32	Alexander Thompson	2266597
	08/03/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 19:32	Alexander Thompson	2266597
	08/03/2021	08/11/2021 16:45	Elliott D. Healy	08/12/2021 17:04	Alexander Thompson	2266597
SM 2340B	08/03/2021			08/12/2021 13:38	Betina Topolski	2266597