Chemical Analysis Report

SO-DIST-2024-03-22-02

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

Event Description: **2024 SMP : Caloosa Creeks (Bee Branch)**
Request ID: **RQ-2024-01-08-50**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: Nicole Reistad

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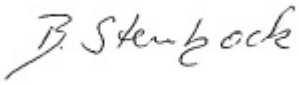
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 04-APR-2024 11:47



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: BEE BRANCH AT LOBLOLLY BAY RD **Collection Date/Time: 03/21/2024 11:30**

Field ID: G3SD0085 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2477393	EPA 200.7 Rev. 4.4	Calcium	12.3		mg/L	P443265	
		Iron	620		ug/L	P443265	
		Magnesium	3.73		mg/L	P443265	
		Potassium	1.6		mg/L	P443265	
		Sodium	17.2		mg/L	P443265	
		Strontium	281		ug/L	P443265	
		Tin	3.0	U	ug/L	P443265	
		Titanium	0.75	U	ug/L	P443265	
		Vanadium	2.0	U	ug/L	P443265	
		Zinc	5.0	U	ug/L	P443265	
	EPA 200.8 Rev. 5.4	Aluminum	133		ug/L	P443265	
		Antimony	0.050	U	ug/L	P443265	
		Arsenic	0.81		ug/L	P443265	
		Barium	14.2		ug/L	P443265	
		Beryllium	0.017	I	ug/L	P443265	
		Boron	30.2		ug/L	P443265	
		Cadmium	0.020	U	ug/L	P443265	
		Chromium	1.0	I	ug/L	P443265	
		Cobalt	0.174		ug/L	P443265	
		Copper	0.41	I	ug/L	P443265	
		Lead	0.20	U	ug/L	P443265	
		Manganese	15.4		ug/L	P443265	
		Molybdenum	0.15	U	ug/L	P443265	
		Nickel	0.50	U	ug/L	P443265	
		Selenium	0.20	U	ug/L	P443265	
		Silver	0.010	U	ug/L	P443265	
		Thallium	0.10	U	ug/L	P443265	
	SM 2340 B-2011	Hardness	46.1		mg/L	P443265	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443265

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: P443265

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: P443265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	80 - 120
Iron	111		P	80 - 120
Magnesium	112		P	80 - 120
Potassium	103		P	80 - 120
Sodium	95.9		P	80 - 120
Strontium	98.0		P	80 - 120
Tin	102		P	80 - 120
Titanium	104		P	80 - 120
Vanadium	102		P	80 - 120
Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.9		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	102		P	85 - 115
Barium	101		P	85 - 115
Beryllium	92.9		P	85 - 115
Boron	102		P	85 - 115
Cadmium	99.1		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	102		P	85 - 115
Copper	99.9		P	85 - 115
Lead	92.6		P	85 - 115
Manganese	98.3		P	85 - 115
Molybdenum	98.3		P	85 - 115
Nickel	100		P	85 - 115
Selenium	101		P	85 - 115
Silver	99.3		P	85 - 115
Thallium	93.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477248	Calcium	101		P	80 - 120
2477248	Iron	106	105	P/P	80 - 120
2477248	Magnesium	107	107	P/P	80 - 120
2477248	Potassium	99.7	98.1	P/P	80 - 120
2477248	Sodium	96.4		P	80 - 120
2477248	Strontium	97.8	98.6	P/P	80 - 120
2477248	Tin	97.6	99.0	P/P	80 - 120
2477248	Titanium	103	104	P/P	80 - 120
2477248	Vanadium	101	102	P/P	80 - 120
2477248	Zinc	100	100	P/P	80 - 120
2477432	Calcium	95.7		P	80 - 120
2477432	Iron	104		P	80 - 120
2477432	Magnesium	97.9		P	80 - 120
2477432	Potassium	98.9		P	80 - 120
2477432	Sodium	96.7		P	80 - 120
2477432	Strontium	94.8		P	80 - 120
2477432	Tin	99.4		P	80 - 120
2477432	Titanium	102		P	80 - 120
2477432	Vanadium	99.3		P	80 - 120
2477432	Zinc	96.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477248	Aluminum	99.6	98.7	P/P	80 - 120
2477248	Antimony	103	101	P/P	80 - 120
2477248	Arsenic	103	101	P/P	80 - 120
2477248	Barium	103	101	P/P	80 - 120
2477248	Beryllium	98.5	93.7	P/P	80 - 120
2477248	Boron	103	103	P/P	80 - 120
2477248	Cadmium	102	101	P/P	80 - 120
2477248	Chromium	102	99.9	P/P	80 - 120
2477248	Cobalt	102	98.8	P/P	80 - 120
2477248	Copper	101	98.7	P/P	80 - 120
2477248	Lead	96.0	94.2	P/P	80 - 120
2477248	Manganese	101	97.7	P/P	80 - 120
2477248	Molybdenum	101	98.3	P/P	80 - 120
2477248	Nickel	103	99.5	P/P	80 - 120
2477248	Selenium	102	101	P/P	80 - 120
2477248	Silver	96.8	96.5	P/P	80 - 120
2477248	Thallium	101	99.2	P/P	80 - 120
2477432	Aluminum	101		P	80 - 120
2477432	Antimony	105		P	80 - 120
2477432	Arsenic	101		P	80 - 120
2477432	Barium	104		P	80 - 120
2477432	Beryllium	98.7		P	80 - 120
2477432	Boron	107		P	80 - 120
2477432	Cadmium	104		P	80 - 120
2477432	Chromium	103		P	80 - 120
2477432	Cobalt	101		P	80 - 120
2477432	Copper	98.8		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477432	Lead	95.2		P	80 - 120
2477432	Manganese	102		P	80 - 120
2477432	Molybdenum	101		P	80 - 120
2477432	Nickel	97.6		P	80 - 120
2477432	Selenium	99.6		P	80 - 120
2477432	Silver	100		P	80 - 120
2477432	Thallium	98.9		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477248	Calcium	0.547	Spike	P	0 - 20
2477248	Iron	0.234	Spike	P	0 - 20
2477248	Magnesium	0.349	Spike	P	0 - 20
2477248	Potassium	1.39	Spike	P	0 - 20
2477248	Sodium	0.599	Spike	P	0 - 20
2477248	Strontium	0.799	Spike	P	0 - 20
2477248	Tin	1.43	Spike	P	0 - 20
2477248	Titanium	0.701	Spike	P	0 - 20
2477248	Vanadium	0.912	Spike	P	0 - 20
2477248	Zinc	0.203	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477248	Aluminum	0.576	Spike	P	0 - 20
2477248	Antimony	1.95	Spike	P	0 - 20
2477248	Arsenic	1.97	Spike	P	0 - 20
2477248	Barium	1.97	Spike	P	0 - 20
2477248	Beryllium	4.73	Spike	P	0 - 20
2477248	Boron	0.381	Spike	P	0 - 20
2477248	Cadmium	1.50	Spike	P	0 - 20
2477248	Chromium	1.65	Spike	P	0 - 20
2477248	Cobalt	3.61	Spike	P	0 - 20
2477248	Copper	2.22	Spike	P	0 - 20
2477248	Lead	1.85	Spike	P	0 - 20
2477248	Manganese	2.21	Spike	P	0 - 20
2477248	Molybdenum	2.76	Spike	P	0 - 20
2477248	Nickel	3.08	Spike	P	0 - 20
2477248	Selenium	0.474	Spike	P	0 - 20
2477248	Silver	0.311	Spike	P	0 - 20
2477248	Thallium	1.33	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: A125013
Included Lab Sample IDs: 2477393

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	98.4	P/P	90 - 110
Antimony	99.2	97.9	P/P	90 - 110
Arsenic	98.6	98.3	P/P	90 - 110
Barium	100	98.8	P/P	90 - 110
Beryllium	96.6	97.8	P/P	90 - 110
Boron	103	101	P/P	90 - 110
Cadmium	100	98.7	P/P	90 - 110
Chromium	97.7	96.2	P/P	90 - 110
Cobalt	97.4	97.5	P/P	90 - 110
Copper	96.9	97.1	P/P	90 - 110
Lead	94.0	93.2	P/P	90 - 110
Manganese	96.9	96.7	P/P	90 - 110
Molybdenum	98.3	97.2	P/P	90 - 110
Nickel	95.5	95.7	P/P	90 - 110
Selenium	100	99.3	P/P	90 - 110
Silver	98.2	97.6	P/P	90 - 110
Thallium	99.7	99.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A125033
Included Lab Sample IDs: 2477393

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	98.6	P/P	90 - 110
Iron	99.4	97.5	P/P	90 - 110
Magnesium	99.6	98.1	P/P	90 - 110
Potassium	99.5	98.6	P/P	90 - 110
Sodium	96.9	95.6	P/P	90 - 110
Strontium	97.5	96.3	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	99.7	98.6	P/P	90 - 110
Zinc	99.5	97.8	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	Calcium	101	101	95.7				0.547
	Iron	111	104	106	105			0.234
	Magnesium	112	107	107	97.9			0.349
	Potassium	103	99.7	98.1	98.9			1.39
	Sodium	95.9	96.4	96.7				0.599
	Strontium	98.0	97.8	98.6	94.8			0.799
	Tin	102	97.6	99.0	99.4			1.43
	Titanium	104	103	104	102			0.701
	Vanadium	102	101	102	99.3			0.912
	Zinc	101	100	100	96.9			0.203
EPA 200.8 Rev. 5.4	Aluminum	98.9	99.6	98.7	101			0.576
	Antimony	101	103	101	105			1.95
	Arsenic	102	103	101	101			1.97
	Barium	101	103	101	104			1.97
	Beryllium	92.9	98.5	93.7	98.7			4.73
	Boron	102	103	103	107			0.381
	Cadmium	99.1	102	101	104			1.50
	Chromium	100	102	99.9	103			1.65
	Cobalt	102	102	98.8	101			3.61
	Copper	99.9	101	98.7	98.8			2.22
	Lead	92.6	96.0	94.2	95.2			1.85
	Manganese	98.3	101	97.7	102			2.21
	Molybdenum	98.3	101	98.3	101			2.76
	Nickel	100	103	99.5	97.6			3.08
	Selenium	101	102	101	99.6			0.474
	Silver	99.3	96.8	96.5	100			0.311
	Thallium	93.4	101	99.2	98.9			1.33

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	2477393
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2477393
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2477393

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	03/22/2024	03/25/2024 13:25	George D Taylor	03/27/2024 16:31	Conrad Hartmann	2477393
EPA 200.8 Rev. 5.4	03/22/2024	03/25/2024 13:25	George D Taylor	03/26/2024 19:44	McKinley C Carter	2477393
SM 2340 B-2011	03/22/2024			03/27/2024 16:31	Conrad Hartmann	2477393