Chemical Analysis Report

SO-DIST-2023-02-09-02

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

Event Description: **2023 SMP: Glades Slough**
Request ID: **RQ-2023-01-23-17**
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: William Mullen

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 21-FEB-2023 10:58

NON-CONFORMANCE REPORT INCLUDED

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: Fenceline Drain @ Blue Head Ranch **Collection Date/Time: 02/07/2023 14:40**

Field ID: G4SD0193 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2386155	EPA 200.7 Rev. 4.4	Calcium	29.2		mg/L	P425650	
		Chromium	1.0	U	ug/L	P425650	
		Iron	1.52E+03		ug/L	P425650	
		Magnesium	11.8		mg/L	P425650	
		Potassium	1.4		mg/L	P425650	
		Sodium	45.5		mg/L	P425650	
		Strontium	189		ug/L	P425650	
		Tin	3.1	I	ug/L	P425650	
		Titanium	1.7	I	ug/L	P425650	
		Vanadium	2.0	U	ug/L	P425650	
		Zinc	5.0	U	ug/L	P425650	
	EPA 200.8 Rev. 5.4	Aluminum	144		ug/L	P425650	
		Antimony	0.059	I	ug/L	P425650	
		Arsenic	1.41		ug/L	P425650	
		Barium	16.7		ug/L	P425650	
		Beryllium	0.011	I	ug/L	P425650	
		Boron	45.9		ug/L	P425650	
		Cadmium	0.020	U	ug/L	P425650	
		Cobalt	0.216		ug/L	P425650	
		Copper	0.41	I	ug/L	P425650	
		Lead	0.22	I	ug/L	P425650	
		Manganese	18.3		ug/L	P425650	
		Molybdenum	0.78		ug/L	P425650	
		Nickel	0.52	I	ug/L	P425650	
		Selenium	0.27	I	ug/L	P425650	
		Silver	0.010	U	ug/L	P425650	
		Thallium	0.10	U	ug/L	P425650	
	SM 2340 B-2011	Hardness	121		mg/L	P425650	

Non-Conformance Report

NCR ID: 9745

Event(s)	Job(s)	Sample(s)	Test(s)
SO-DIST-2023-02-09-02	TLH-2023-02-09-21	2386155	

NCR Type: SHIPPING/RECEIVING **NCR Category: Preservation Not Intact**

Observation: Sample not preserved to pH < 2.

Resolution: Sample preserved in the laboratory with nitric acid on 02/09/2023 at 10:00

HNO3 Lot# NA1105100 | Expiration Date: 06/07/2023

Authorized by/Date: Kyle Klug 2/16/2023

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425650

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/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: P425650

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
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: P425650

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Chromium	99.9		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	106		P	85 - 115
Strontium	102		P	85 - 115
Tin	101		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	100		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425650

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	96.5		P	85 - 115
Arsenic	102		P	85 - 115
Barium	102		P	85 - 115
Beryllium	98.7		P	85 - 115
Boron	103		P	85 - 115
Cadmium	102		P	85 - 115
Cobalt	101		P	85 - 115
Copper	101		P	85 - 115
Lead	98.0		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	102		P	85 - 115
Nickel	101		P	85 - 115
Selenium	101		P	85 - 115
Silver	101		P	85 - 115
Thallium	95.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386251	Calcium	102		P	80 - 120
2386251	Chromium	98.2	96.4	P/P	80 - 120
2386251	Iron	106	104	P/P	80 - 120
2386251	Magnesium	105	102	P/P	80 - 120
2386251	Potassium	101	101	P/P	80 - 120
2386251	Sodium	104	104	P/P	80 - 120
2386251	Strontium	102	102	P/P	80 - 120
2386251	Tin	101	101	P/P	80 - 120
2386251	Titanium	101	100	P/P	80 - 120
2386251	Vanadium	99.9	98.7	P/P	80 - 120
2386251	Zinc	100	98.2	P/P	80 - 120
2386397	Calcium	99.2		P	80 - 120
2386397	Chromium	98.3		P	80 - 120
2386397	Iron	105		P	80 - 120
2386397	Magnesium	101		P	80 - 120
2386397	Potassium	102		P	80 - 120
2386397	Sodium	105		P	80 - 120
2386397	Strontium	102		P	80 - 120
2386397	Tin	101		P	80 - 120
2386397	Titanium	101		P	80 - 120
2386397	Vanadium	102		P	80 - 120
2386397	Zinc	98.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386251	Aluminum	101	103	P/P	80 - 120
2386251	Antimony	97.1	99.6	P/P	80 - 120
2386251	Arsenic	101	103	P/P	80 - 120
2386251	Barium	102	104	P/P	80 - 120
2386251	Beryllium	101	101	P/P	80 - 120
2386251	Boron	102	107	P/P	80 - 120
2386251	Cadmium	102	106	P/P	80 - 120
2386251	Cobalt	99.0	101	P/P	80 - 120
2386251	Copper	96.7	99.9	P/P	80 - 120
2386251	Lead	97.6	98.0	P/P	80 - 120
2386251	Manganese	103	106	P/P	80 - 120
2386251	Molybdenum	103	105	P/P	80 - 120
2386251	Nickel	99.0	101	P/P	80 - 120
2386251	Selenium	101	101	P/P	80 - 120
2386251	Silver	100	102	P/P	80 - 120
2386251	Thallium	95.8	96.6	P/P	80 - 120
2386397	Aluminum	102		P	80 - 120
2386397	Antimony	97.9		P	80 - 120
2386397	Arsenic	102		P	80 - 120
2386397	Barium	102		P	80 - 120
2386397	Beryllium	98.2		P	80 - 120
2386397	Boron	106		P	80 - 120
2386397	Cadmium	105		P	80 - 120
2386397	Cobalt	97.5		P	80 - 120
2386397	Copper	97.9		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386397	Lead	97.7		P	80 - 120
2386397	Manganese	104		P	80 - 120
2386397	Molybdenum	105		P	80 - 120
2386397	Nickel	97.8		P	80 - 120
2386397	Selenium	99.5		P	80 - 120
2386397	Silver	98.9		P	80 - 120
2386397	Thallium	93.5		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386251	Calcium	0.0765	Spike	P	0 - 20
2386251	Chromium	1.85	Spike	P	0 - 20
2386251	Iron	1.36	Spike	P	0 - 20
2386251	Magnesium	1.25	Spike	P	0 - 20
2386251	Potassium	0.0512	Spike	P	0 - 20
2386251	Sodium	0.217	Spike	P	0 - 20
2386251	Strontium	0.364	Spike	P	0 - 20
2386251	Tin	0.618	Spike	P	0 - 20
2386251	Titanium	1.08	Spike	P	0 - 20
2386251	Vanadium	1.25	Spike	P	0 - 20
2386251	Zinc	2.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386251	Aluminum	2.03	Spike	P	0 - 20
2386251	Antimony	2.54	Spike	P	0 - 20
2386251	Arsenic	1.96	Spike	P	0 - 20
2386251	Barium	2.19	Spike	P	0 - 20
2386251	Beryllium	0.684	Spike	P	0 - 20
2386251	Boron	4.13	Spike	P	0 - 20
2386251	Cadmium	3.18	Spike	P	0 - 20
2386251	Cobalt	1.92	Spike	P	0 - 20
2386251	Copper	3.29	Spike	P	0 - 20
2386251	Lead	0.389	Spike	P	0 - 20
2386251	Manganese	2.91	Spike	P	0 - 20
2386251	Molybdenum	1.93	Spike	P	0 - 20
2386251	Nickel	2.13	Spike	P	0 - 20
2386251	Selenium	0.0788	Spike	P	0 - 20
2386251	Silver	1.67	Spike	P	0 - 20
2386251	Thallium	0.850	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: A117439
Included Lab Sample IDs: 2386155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	97.3	P/P	90 - 110
Chromium	102	102	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	102	99.2	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	104	101	P/P	90 - 110
Strontium	104	105	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	102	103	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117441
Included Lab Sample IDs: 2386155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.8	100	P/P	90 - 110
Antimony	95.6	96.3	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	99.0	100	P/P	90 - 110
Beryllium	100	101	P/P	90 - 110
Boron	98.7	104	P/P	90 - 110
Cadmium	99.1	102	P/P	90 - 110
Cobalt	96.5	96.4	P/P	90 - 110
Copper	96.4	95.5	P/P	90 - 110
Lead	95.8	96.0	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Molybdenum	100	101	P/P	90 - 110
Nickel	96.7	96.2	P/P	90 - 110
Selenium	100	100	P/P	90 - 110
Silver	99.3	99.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117501
Included Lab Sample IDs: 2386155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	102	104	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	100	102	99.2				0.0765
	Chromium	99.9	98.2	96.4	98.3			1.85
	Iron	104	106	104	105			1.36
	Magnesium	103	105	102	101			1.25
	Potassium	101	101	101	102			0.0512
	Sodium	106	104	104	105			0.217
	Strontium	102	102	102	102			0.364
	Tin	101	101	101	101			0.618
	Titanium	101	101	100	101			1.08
	Vanadium	100	99.9	98.7	102			1.25
	Zinc	102	100	98.2	98.5			2.22
EPA 200.8 Rev. 5.4	Aluminum	102	101	103	102			2.03
	Antimony	96.5	97.1	99.6	97.9			2.54
	Arsenic	102	101	103	102			1.96
	Barium	102	102	104	102			2.19
	Beryllium	98.7	101	101	98.2			0.684
	Boron	103	102	107	106			4.13
	Cadmium	102	102	106	105			3.18
	Cobalt	101	99.0	101	97.5			1.92
	Copper	101	96.7	99.9	97.9			3.29
	Lead	98.0	97.6	98.0	97.7			0.389
	Manganese	103	103	106	104			2.91
	Molybdenum	102	103	105	105			1.93
	Nickel	101	99.0	101	97.8			2.13
	Selenium	101	99.5	101	101			0.0788
	Silver	101	100	102	98.9			1.67
	Thallium	95.2	95.8	96.6	93.5			0.850

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	2386155
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2386155
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2386155

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	02/09/2023	02/10/2023 13:20	George D Taylor	02/14/2023 18:51	McKinley C Carter	2386155
EPA 200.8 Rev. 5.4	02/09/2023	02/10/2023 13:20	George D Taylor	02/14/2023 18:42	Emily M Philpot	2386155
	02/09/2023	02/10/2023 13:20	George D Taylor	02/16/2023 20:39	Emily M Philpot	2386155
SM 2340 B-2011	02/09/2023			02/14/2023 18:51	McKinley C Carter	2386155