

Chemical Analysis Report

SE-DIST-2019-10-17-01

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

Event Description: **SMP-Horses**
Request ID: **RQ-2019-10-07-29**
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: Drew Liddick

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-NOV-2019 14:38

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: Nutrients.

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: Pine Lake Center

Collection Date/Time: 10/16/2019 12:45

Field ID: G3SE0045

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2129061	EPA 180.1 Rev. 2.0	Turbidity	4.6	A	NTU	P372678	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P373388	
		Sulfate	10		mg SO4/L	P373390	
	SM 2120 B	Color (true)	31	A	PCU	P372685	
	SM 2320 B-97	Total Alkalinity	135		mg CaCO3/L	P372878	
	SM 2540 C-97	TDS	213		mg/L	P373146	
	SM 2540 D-97	TSS	7	I	mg/L	P372912	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P372882	
2129062	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P372986	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P373080	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P372809	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P372905	
	SM 5310 B-00	Organic Carbon	8.4		mg C/L	P372968	
2129063	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P372701	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P372678

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373388

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373390

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372986

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373080

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372809

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372905

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372701

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P372685

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P372878

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P373146

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P372912

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P372882

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P372968

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372986

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372809

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372905

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372701

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	102		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P372685

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P372878

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P372882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P372968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129056	Chloride	98.3		P	90 - 110
2129206	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129056	Sulfate	96.3		P	90 - 110
2129206	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129171	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129062	Kjeldahl Nitrogen	105	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129040	NO2NO3-N	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372905

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129040	Total-P	95.1	92.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129063	O-Phosphate-P	93.9	96.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P372882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128512	Fluoride	97.3	95.9	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P372968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129062	Organic Carbon	103	99.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P372678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129061	Turbidity	1.31	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129056	Chloride	0.432	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129056	Sulfate	0.218	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129171	Ammonia-N	0.482	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129062	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129040	NO2NO3-N	0.216	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129040	Total-P	1.42	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129063	O-Phosphate-P	2.22	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P372685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129061	Color (true)	0.229	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P372878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128512	Total Alkalinity	0.554	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P373146

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129111	TDS	1.10	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P372882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128512	Fluoride	0.960	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P372968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129062	Organic Carbon	2.62	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A95040

Included Lab Sample IDs: 2129061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	98.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A95042

Included Lab Sample IDs: 2129061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	98.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95048

Included Lab Sample IDs: 2129063

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95097

Included Lab Sample IDs: 2129062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A95130

Included Lab Sample IDs: 2129061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A95130

Included Lab Sample IDs: 2129061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	99.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A95164

Included Lab Sample IDs: 2129062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95172

Included Lab Sample IDs: 2129062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95205

Included Lab Sample IDs: 2129062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95287

Included Lab Sample IDs: 2129062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	93.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A95307

Included Lab Sample IDs: 2129061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	101	101	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	MS
EPA 180.1 Rev. 2.0	Turbidity				1.31	
EPA 300.0 Rev. 2.1	Chloride	103	98.3	102	0.432	
	Sulfate	103	96.3	102	0.218	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	102	102		0.482
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	105	109		1.94
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	97.8			0.216
EPA 365.1 Rev. 2.0	Total-P	96.6	95.1	92.4		1.42
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	93.9	96.1		2.22
SM 2120 B	Color (true)	99.4			0.229	
SM 2320 B-97	Total Alkalinity	104			0.554	
SM 2540 C-97	TDS				1.10	
SM 4500 F-C-97	Fluoride	94.8	97.3	95.9		0.960
SM 5310 B-00	Organic Carbon	96.2	103	99.7		2.62

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2129061
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2129061
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2129061
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2129062
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2129062
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2129062
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2129062
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2129063
SM 2120 B / E31780	True Color measured at 450 nm	2129061
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2129061
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2129061
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2129061
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2129061
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2129062

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/17/2019			10/17/2019 15:48	Samantha Davila	2129061
EPA 300.0 Rev. 2.1	10/17/2019			10/29/2019 14:18	Julia Storbeck	2129061
EPA 350.1 Rev. 2.0	10/17/2019			10/22/2019 14:06	Ping Hua	2129062
EPA 351.2 Rev. 2.0	10/17/2019	10/24/2019 13:16	Sima Feizi	10/28/2019 16:57	Jhamieka S. Greenwood	2129062
EPA 353.2 Rev. 2.0	10/17/2019			10/21/2019 11:43	Lauren Lees	2129062
EPA 365.1 Rev. 2.0	10/17/2019	10/22/2019 14:40	Lipi Saha	10/23/2019 12:30	Rosalyn Ballman	2129062
EPA 365.1 Rev. 2.0 dissolved	10/17/2019			10/17/2019 14:48	Virginia P. Brown	2129063
SM 2120 B	10/17/2019			10/17/2019 17:49	Madeline Funaro	2129061
SM 2320 B-97	10/17/2019			10/19/2019 18:00	Dale L. Simmons	2129061
SM 2540 C-97	10/17/2019			10/18/2019 16:10	Rosalyn Ballman	2129061
SM 2540 D-97	10/17/2019			10/18/2019 16:10	Rosalyn Ballman	2129061
SM 4500 F-C-97	10/17/2019			10/19/2019 18:00	Dale L. Simmons	2129061
SM 5310 B-00	10/17/2019			10/21/2019 19:06	Madeline Funaro	2129062