

Chemical Analysis Report

CEN-DIST-2021-08-13-03

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

Event Description: **Three Forks Marsh**
Request ID: **RQ-2021-08-16-11**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matt Bearden

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: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 08-SEP-2021 09:56



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: Blanket Bay Slough @ SR 60

Collection Date/Time: 08/12/2021 11:15

Field ID: G4CE0180

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269442	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P402482	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P402996	
		Sulfate	0.82		mg SO4/L	P402999	
	SM 2120 B-2011	Color (true)	950		PCU	P402479	
	SM 2320 B-2011	Total Alkalinity	13		mg CaCO3/L	P402666	
	SM 2540 C-2011	TDS	180		mg/L	P402819	
	SM 2540 D-2011	TSS	6	I	mg/L	P403005	
	SM 4500 F-C-2011	Fluoride	0.067	I	mg F/L	P402668	
2269443	EPA 350.1 Rev. 2.0	Ammonia-N	0.070		mg N/L	P402759	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.8		mg N/L	P403022	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P402674	
	EPA 365.1 Rev. 2.0	Total-P	0.43		mg P/L	P402562	MS
	SM 5310 B-2011	Organic Carbon	51		mg C/L	P403116	
2269444	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.24		mg P/L	P402471	

Ref. Method and Comment:

SM 2540 D-2011: 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: P402482

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402996

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402999

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402759

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403022

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402674

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402562

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402471

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

Reference Method: SM 2120 B-2011
Batch ID: P402479

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P402666

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

Reference Method: SM 2540 C-2011
Batch ID: P402819

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P403005

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P402668

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P403116

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: P402996

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402999

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402759

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403022

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402562

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402471

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P402479

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P402666

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P402668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P403116

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402996

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269293	Chloride	97.5		P	90 - 110
2269459	Chloride	97.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269293	Sulfate	97.5		P	90 - 110
2269459	Sulfate	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269476	Ammonia-N	97.4	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403022

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269490	Kjeldahl Nitrogen	105	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269433	NO2NO3-N	96.0	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402562

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269418	Total-P	115	111	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269477	O-Phosphate-P	99.0	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P402668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269281	Fluoride	99.2	98.2	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403116

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269862	Organic Carbon	96.4	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269431	Turbidity	6.18	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402996

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269293	Chloride	2.23	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269293	Sulfate	0.141	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269476	Ammonia-N	0.571	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403022

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269490	Kjeldahl Nitrogen	2.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269433	NO2NO3-N	0.375	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269418	Total-P	2.81	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269477	O-Phosphate-P	0.608	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P402479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269336	Color (true)	0.288	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P402666

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269281	Total Alkalinity	0.793	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P402819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269417	TDS	3.98	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P402668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269281	Fluoride	0.988	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P403116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269862	Organic Carbon	0.114	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A107247

Included Lab Sample IDs: 2269444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.3	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A107251

Included Lab Sample IDs: 2269442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107252

Included Lab Sample IDs: 2269442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A107332

Included Lab Sample IDs: 2269442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	103	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107332

Included Lab Sample IDs: 2269442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107338

Included Lab Sample IDs: 2269443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107367

Included Lab Sample IDs: 2269443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107424

Included Lab Sample IDs: 2269443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107449

Included Lab Sample IDs: 2269442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	99.2	P/P	90 - 110
Sulfate	99.4	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107509

Included Lab Sample IDs: 2269443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.3	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107529

Included Lab Sample IDs: 2269443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	98.0	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				6.18	
EPA 300.0 Rev. 2.1	Chloride	98.6	97.5	97.8	2.23	
	Sulfate	98.7	97.5	97.8	0.141	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	97.4	96.8		0.571
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	105	108		2.21
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	96.0	96.4		0.375
EPA 365.1 Rev. 2.0	Total-P	108	115	111		2.81
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	99.0	98.4		0.608
SM 2120 B-2011	Color (true)	102			0.288	
SM 2320 B-2011	Total Alkalinity	102			0.793	
SM 2540 C-2011	TDS				3.98	
SM 4500 F-C-2011	Fluoride	99.6	99.2	98.2		0.988
SM 5310 B-2011	Organic Carbon	94.3	96.4	96.6		0.114

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2269442
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2269442
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2269442
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2269443
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2269443
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2269443
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2269443
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2269444
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2269442
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2269442
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2269442
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2269442
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2269442
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2269443

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	08/13/2021			08/13/2021 15:42	Sarah A Nixon	2269442
EPA 300.0 Rev. 2.1	08/13/2021			08/25/2021 17:10	Lipi Saha	2269442
EPA 350.1 Rev. 2.0	08/13/2021			08/20/2021 12:41	Roberta Tatti	2269443
EPA 351.2 Rev. 2.0	08/13/2021	08/26/2021 18:26	Benjamin T. Nordmann	08/27/2021 13:01	Virginia P. Brown	2269443
EPA 353.2 Rev. 2.0	08/13/2021			08/19/2021 09:42	Beverly Y. Sanders	2269443
EPA 365.1 Rev. 2.0	08/13/2021	08/17/2021 14:55	Simonne.V. Calhoun	08/24/2021 11:21	Lipi Saha	2269443
EPA 365.1 Rev. 2.0 dissolved	08/13/2021			08/13/2021 15:11	Blanca Fach	2269444
SM 2120 B-2011	08/13/2021			08/13/2021 17:01	Sarah A Nixon	2269442
SM 2320 B-2011	08/13/2021			08/18/2021 21:17	Dale L. Simmons	2269442
SM 2540 C-2011	08/13/2021			08/18/2021 11:05	Yijie Li	2269442
SM 2540 D-2011	08/13/2021			08/18/2021 11:05	Yijie Li	2269442
SM 4500 F-C-2011	08/13/2021			08/18/2021 21:17	Dale L. Simmons	2269442
SM 5310 B-2011	08/13/2021			08/27/2021 20:59	Madeline Gruver	2269443