

Chemical Analysis Report

CEN-DIST-2020-10-07-01

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

Event Description: **Puzzle Lake Drain/Ruth/Florence**
Request ID: **RQ-2020-09-14-38**
Customer: **CEN-DIST**
Project ID: **SMP**

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Date Certified: 22-OCT-2020 12:27



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: Florence Lake @ Center

Collection Date/Time: 10/06/2020 12:22

Field ID: G3CE0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200308	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P388351	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P388632	
		Sulfate	23		mg SO4/L	P388635	
		Color (true)	300		PCU	P388354	
	SM 2320 B-2011	Total Alkalinity	72		mg CaCO3/L	P388574	
	SM 2540 C-2011	TDS	514	A	mg/L	P388805	
	SM 2540 D-2011	TSS	3	IA	mg/L	P388779	
	SM 4500 F-C-2011	Fluoride	0.11		mg F/L	P388577	
2200309	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P388495	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P388656	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P388450	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P388528	
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P388444	
2200310	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P388367	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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: P388351

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388632

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388495

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388656

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388450

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388528

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388367

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

Reference Method: SM 2120 B-2011
Batch ID: P388354

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P388574

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

Reference Method: SM 2540 C-2011
Batch ID: P388805

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388779

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P388444

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: P388632

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388495

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388656

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388450

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388528

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388367

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.0		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388354

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388574

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200313	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200313	Sulfate	103		P	90 - 110
2200498	Sulfate	97.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P388495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200192	Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P388656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201183	Kjeldahl Nitrogen	103	114	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P388450

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200147	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P388528

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200309	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P388367

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200139	O-Phosphate-P	95.8	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
 Batch ID: P388577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200694	Fluoride	98.1	98.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
 Batch ID: P388444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200192	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P388351

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Turbidity	2.65	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Chloride	3.30	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Sulfate	1.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P388495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200192	Ammonia-N	2.25	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P388656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201183	Kjeldahl Nitrogen	8.51	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P388450

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200147	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P388528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200309	Total-P	0.964	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P388367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200139	O-Phosphate-P	2.91	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P388354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200331	Color (true)	4.83	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200694	Total Alkalinity	1.20	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P388805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200308	TDS	0.195	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200694	Fluoride	0.467	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200192	Organic Carbon	0.220	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: A101415

Included Lab Sample IDs: 2200308

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

Reference Method: SM 2120 B-2011

Run ID: A101417

Included Lab Sample IDs: 2200308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101426

Included Lab Sample IDs: 2200310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	98.0	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A101446

Included Lab Sample IDs: 2200309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.6	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101447

Included Lab Sample IDs: 2200309

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101460

Included Lab Sample IDs: 2200309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	101	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A101486

Included Lab Sample IDs: 2200308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	105	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A101486

Included Lab Sample IDs: 2200308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101493

Included Lab Sample IDs: 2200308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101538

Included Lab Sample IDs: 2200309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.4	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101547

Included Lab Sample IDs: 2200309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	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	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				2.65	
EPA 300.0 Rev. 2.1	Chloride	104	106		3.30	
	Sulfate	103	103 97.4		1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	98.7	100 103			2.25
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103 114			8.51
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102 102			0.491
EPA 365.1 Rev. 2.0	Total-P	106	107 108			0.964
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.0	95.8 98.8			2.91
SM 2120 B-2011	Color (true)	96.6			4.83	
SM 2320 B-2011	Total Alkalinity	99.8			1.20	
SM 2540 C-2011	TDS				0.195	
SM 4500 F-C-2011	Fluoride	99.4	98.1 98.8			0.467
SM 5310 B-2011	Organic Carbon	97.4	101 101			0.220

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2200308
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2200308
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2200308
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2200309
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2200309
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2200309
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2200309
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2200310
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2200308
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2200308
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2200308
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2200308
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2200308
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2200309

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	10/07/2020			10/07/2020 15:48	Yen Ta	2200308
EPA 300.0 Rev. 2.1	10/07/2020			10/14/2020 06:58	Elliott Rodriguez	2200308
EPA 350.1 Rev. 2.0	10/07/2020			10/10/2020 11:30	Ping Hua	2200309
EPA 351.2 Rev. 2.0	10/07/2020	10/14/2020 12:30	David Boose	10/15/2020 16:48	Julia Storbeck	2200309
EPA 353.2 Rev. 2.0	10/07/2020			10/09/2020 10:44	Beverly Y. Sanders	2200309
EPA 365.1 Rev. 2.0	10/07/2020	10/12/2020 12:20	Yen Ta	10/15/2020 13:19	Lipi Saha	2200309
EPA 365.1 Rev. 2.0 dissolved	10/07/2020			10/07/2020 15:48	Blanca Fach	2200310
SM 2120 B-2011	10/07/2020			10/07/2020 17:16	Benjamin T. Nordmann	2200308
SM 2320 B-2011	10/07/2020			10/13/2020 07:04	Lauren Lees	2200308
SM 2540 C-2011	10/07/2020			10/08/2020 15:02	Yijie Li	2200308
SM 2540 D-2011	10/07/2020			10/08/2020 15:02	Yijie Li	2200308
SM 4500 F-C-2011	10/07/2020			10/13/2020 07:04	Lauren Lees	2200308
SM 5310 B-2011	10/07/2020			10/09/2020 02:13	Madeline Gruver	2200309