Chemical Analysis Report

CEN-DIST-2018-08-24-02

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

Event Description: **Tiger**
Request ID: **RQ-2018-08-20-31**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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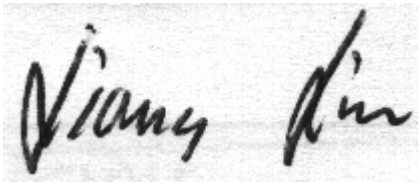
Date Certified: 11-SEP-2018 14:08



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 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: Tiger Creek 1.45km downstream of Lake Kissimmee (3183D)

Collection Date/Time: 08/23/2018 11:15

Field ID: G4CE0070

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2020205	EPA 180.1 Rev. 2.0	Turbidity	5.9	A	NTU	P350732	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P350987	
		Sulfate	12		mg SO4/L	P350990	
	SM 2120 B	Color (true)	67		PCU	P350730	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P351143	
	SM 2540 C-97	TDS	100		mg/L	P351068	
	SM 2540 D-97	TSS	8	I	mg/L	P351030	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P351052	
2020206	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P350917	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P350828	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P350859	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P350954	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P350877	
2020207	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.090		mg P/L	P350728	

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: P350732

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350917

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350828

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350859

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350954

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350728

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

Reference Method: SM 2120 B
Batch ID: P350730

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P351143

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-97
Batch ID: P351068

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351030

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350877

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: P350987

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350917

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	101		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350859

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: P350954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350728

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P350730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.6		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350877

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020175	Chloride	97.6		P	90 - 110
2020467	Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020175	Sulfate	98.1		P	90 - 110
2020467	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350917

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020144	Ammonia-N	95.4	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020206	Kjeldahl Nitrogen	99.1	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020143	NO2NO3-N	96.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020176	Total-P	96.2	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350728

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020207	O-Phosphate-P	98.7	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020073	Fluoride	98.1	98.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019917	Organic Carbon	97.9	97.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020205	Turbidity	4.75	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020175	Chloride	8.28	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020175	Sulfate	9.98	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020144	Ammonia-N	2.59	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020206	Kjeldahl Nitrogen	2.19	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020143	NO2NO3-N	0.580	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020176	Total-P	1.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020207	O-Phosphate-P	0.106	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P350730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020175	Color (true)	1.69	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020073	Total Alkalinity	0.102	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P351068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020073	TDS	4.03	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020073	Fluoride	0.477	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P350877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019917	Organic Carbon	0.666	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A86105
Included Lab Sample IDs: 2020207

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A86107
Included Lab Sample IDs: 2020205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	96.7	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A86108
Included Lab Sample IDs: 2020205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86155
Included Lab Sample IDs: 2020206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A86162
Included Lab Sample IDs: 2020206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86177
Included Lab Sample IDs: 2020206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.6	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86185
Included Lab Sample IDs: 2020206

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A86194
Included Lab Sample IDs: 2020205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	106	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86222
Included Lab Sample IDs: 2020206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A86252
Included Lab Sample IDs: 2020205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A86303
Included Lab Sample IDs: 2020205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	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					4.75	
EPA 300.0 Rev. 2.1	Chloride	102	97.6	97.0		8.28	
	Sulfate	101	98.1	101		9.98	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	95.4	98.4			2.59
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	99.1	95.0			2.19
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	96.5	97.5			0.580
EPA 365.1 Rev. 2.0	Total-P	97.2	96.2	95.0			1.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	98.7	98.5			0.106
SM 2120 B	Color (true)	97.6				1.69	
SM 2320 B-97	Total Alkalinity	103				0.102	
SM 2540 C-97	TDS					4.03	
SM 4500 F-C-97	Fluoride	97.7	98.1	98.3			0.477
SM 5310 B-00	Organic Carbon	95.6	97.9	97.1			0.666

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2020205
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2020205
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2020205
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2020206
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2020206
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2020206
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2020206
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2020207
SM 2120 B / E31780	True Color measured at 450 nm	2020205
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2020205
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2020205
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2020205
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2020205
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2020206

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	08/24/2018			08/24/2018 16:07	Julia Storbeck	2020205
EPA 300.0 Rev. 2.1	08/24/2018			08/30/2018 19:55	Lipi Saha	2020205
EPA 350.1 Rev. 2.0	08/24/2018			08/29/2018 13:13	Ping Hua	2020206
EPA 351.2 Rev. 2.0	08/24/2018	08/28/2018 11:00	Adrian Shelby	08/29/2018 13:42	Joseph Suarez	2020206
EPA 353.2 Rev. 2.0	08/24/2018			08/28/2018 14:06	Lauren Bottorf	2020206
EPA 365.1 Rev. 2.0	08/24/2018	08/30/2018 11:37	Sima Feizi	08/31/2018 07:42	Beverly Y. Sanders	2020206
EPA 365.1 Rev. 2.0 dissolved	08/24/2018			08/24/2018 14:30	Lipi Saha	2020207
SM 2120 B	08/24/2018			08/24/2018 16:02	Julia Storbeck	2020205
SM 2320 B-97	08/24/2018			09/05/2018 20:13	Dale L. Simmons	2020205
SM 2540 C-97	08/24/2018			08/28/2018 15:02	Yijie Li	2020205
SM 2540 D-97	08/24/2018			08/28/2018 15:02	Yijie Li	2020205
SM 4500 F-C-97	08/24/2018			08/31/2018 04:37	Dale L. Simmons	2020205
SM 5310 B-00	08/24/2018			08/29/2018 04:36	Megan Treadwell	2020206