

Chemical Analysis Report

CEN-DIST-2018-03-09-01

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

Event Description: **Tiger / Reedy**
Request ID: **RQ-2018-01-15-38**
Customer: **CEN-DIST**
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 30-MAR-2018 13:54



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: Grasshopper Lake South @ 325m SE of Boat Ramp (2916B) **Collection Date/Time: 03/08/2018 10:40**

Field ID: G2CE0070

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973607	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P341323	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P341900	
		Sulfate	3.5		mg SO4/L	P341903	
	SM 2120 B	Color (true)	100		PCU	P341319	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P341624	
	SM 2540 C-97	TDS	41		mg/L	P341835	
	SM 2540 D-97	TSS	3	I	mg/L	P341787	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P341829	
1973608	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P341874	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P341536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P341529	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P341448	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P341972	
1973609	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341346	

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: P341323

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341900

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341903

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P341874

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P341536

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341448

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341346

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

Reference Method: SM 2120 B
Batch ID: P341319

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341624

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

Reference Method: SM 2540 C-97
Batch ID: P341835

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341787

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P341829

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P341972

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: P341900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341903

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341874

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341536

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341448

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341346

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.1		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P341624

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.7		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P341829

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.0		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P341972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P341900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973061	Chloride	97.6		P	90 - 110
1973351	Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P341903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973061	Sulfate	100		P	90 - 110
1973351	Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P341874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973332	Ammonia-N	98.1	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P341536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973468	Kjeldahl Nitrogen	97.1	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P341529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973461	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P341448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973353	Total-P	99.0	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P341346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973609	O-Phosphate-P	93.2	94.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P341829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973287	Fluoride	94.2	95.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P341972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973291	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973467	Turbidity	0.388	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973061	Chloride	0.639	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973061	Sulfate	1.49	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973332	Ammonia-N	1.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973468	Kjeldahl Nitrogen	3.13	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
--------------------------	-----------	-----------	-------------------	-----------	----------------

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973461	NO2NO3-N	0.477	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973353	Total-P	2.80	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973609	O-Phosphate-P	0.855	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973594	Color (true)	3.91	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973287	Total Alkalinity	0.314	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P341835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973594	TDS	5.85	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P341829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973287	Fluoride	0.953	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P341972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973291	Organic Carbon	1.11	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: SM 2120 B
Run ID: A82535
Included Lab Sample IDs: 1973607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	97.6	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82536
Included Lab Sample IDs: 1973607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82545
Included Lab Sample IDs: 1973609

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82605
Included Lab Sample IDs: 1973608

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

Reference Method: SM 2320 B-97
Run ID: A82634
Included Lab Sample IDs: 1973607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.5	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A82647
Included Lab Sample IDs: 1973608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A82656
Included Lab Sample IDs: 1973608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A82726

Included Lab Sample IDs: 1973607

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82743

Included Lab Sample IDs: 1973608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82750

Included Lab Sample IDs: 1973607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.3	98.3	P/P	90 - 110
Sulfate	98.1	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A82777

Included Lab Sample IDs: 1973608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.7	100	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.388	
EPA 300.0 Rev. 2.1	Chloride	96.3	97.6	97.3		0.639	
	Sulfate	97.9	100	98.9		1.49	
EPA 350.1 Rev. 2.0	Ammonia-N	97.1	98.1	99.6			1.47
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	97.1	103			3.13
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	105	104			0.477
EPA 365.1 Rev. 2.0	Total-P	103	99.0	95.8			2.80
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1	93.2	94.0			0.855
SM 2120 B	Color (true)					3.91	
SM 2320 B-97	Total Alkalinity	99.7				0.314	
SM 2540 C-97	TDS					5.85	
SM 4500 F-C-97	Fluoride	94.0	94.2	95.4			0.953
SM 5310 B-00	Organic Carbon	98.0	100	101			1.11

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1973607
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1973607
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1973607
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1973608
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1973608
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1973608
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1973608
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1973609
SM 2120 B / E31780	True Color measured at 450 nm	1973607
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1973607
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1973607
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1973607
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1973607
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1973608

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	03/09/2018			03/09/2018 15:21	Tanya Welborn	1973607
EPA 300.0 Rev. 2.1	03/09/2018			03/20/2018	Julia Storbeck	1973607
EPA 350.1 Rev. 2.0	03/09/2018			03/15/2018	Ping Hua	1973608
EPA 351.2 Rev. 2.0	03/09/2018	03/14/2018	Adrian Shelby	03/15/2018	Joseph Suarez	1973608
EPA 353.2 Rev. 2.0	03/09/2018			03/14/2018	Lauren Bottorf	1973608
EPA 365.1 Rev. 2.0	03/09/2018	03/13/2018	Lipi Saha	03/16/2018	Lipi Saha	1973608
EPA 365.1 Rev. 2.0 dissolved	03/09/2018			03/09/2018 16:29	Megan Treadwell	1973609
SM 2120 B	03/09/2018			03/09/2018 16:09	Tanya Welborn	1973607
SM 2320 B-97	03/09/2018			03/15/2018	Dale L. Simmons	1973607
SM 2540 C-97	03/09/2018			03/14/2018	Yijie Li	1973607
SM 2540 D-97	03/09/2018			03/14/2018	Yijie Li	1973607
SM 4500 F-C-97	03/09/2018			03/20/2018	Lauren Bottorf	1973607
SM 5310 B-00	03/09/2018			03/21/2018	Megan Treadwell	1973608