

Chemical Analysis Report

CEN-DIST-2019-10-09-01

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

Event Description: **Lk Kathryn + LVI**
Request ID: **RQ-2019-09-09-39**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-OCT-2019 15:38

A handwritten signature in black ink, appearing to read "Liang Lin", 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: $1.3\text{E}+03$, 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: Lake Kathryn @ Center

Collection Date/Time: 10/08/2019 11:58

Field ID: G2CE0217

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2126280	EPA 180.1 Rev. 2.0	Turbidity	1.8	A	NTU	P372216	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P372585	
		Sulfate	5.6		mg SO4/L	P372589	
	SM 2120 B	Color (true)	44		PCU	P372327	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P372632	
	SM 2540 C-97	TDS	98	A	mg/L	P372815	
	SM 2540 D-97	TSS	3	IA	mg/L	P372824	
	SM 4500 F-C-97	Fluoride	0.059	I	mg F/L	P372634	
2126281	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P372452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P372284	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P372434	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P372345	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P372322	
2126282	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P372256	

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: P372216

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372585

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372589

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372452

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372284

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372434

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372345

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372256

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

Reference Method: SM 2120 B
Batch ID: P372327

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P372632

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

Reference Method: SM 2540 C-97
Batch ID: P372815

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P372824

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P372634

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P372322

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: P372585

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P372589

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372452

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372284

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372434

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: P372345

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372256

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

Reference Method: SM 2120 B
 Batch ID: P372327

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.2		P	85 - 115

Reference Method: SM 2320 B-97
 Batch ID: P372632

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: P372634

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P372322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125927	Chloride	101		P	90 - 110
2126300	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125927	Sulfate	102		P	90 - 110
2126300	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126256	Ammonia-N	100	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372284

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126281	Kjeldahl Nitrogen	105	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123914	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372345

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126281	Total-P	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372256

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126282	O-Phosphate-P	97.9	98.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P372634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125300	Fluoride	94.4	93.9	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P372322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126271	Organic Carbon	97.8	107	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P372216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126280	Turbidity	11.3	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P372585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125927	Chloride	1.37	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P372589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125927	Sulfate	1.83	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126256	Ammonia-N	0.393	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126281	Kjeldahl Nitrogen	0.121	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123914	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126281	Total-P	0.919	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126282	O-Phosphate-P	0.204	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P372327

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126332	Color (true)	0.356	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P372632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125300	Total Alkalinity	0.0264	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P372815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126280	TDS	1.03	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P372634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125300	Fluoride	0.474	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P372322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126271	Organic Carbon	5.61	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: A94835

Included Lab Sample IDs: 2126280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	97.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94852

Included Lab Sample IDs: 2126282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	98.3	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94882

Included Lab Sample IDs: 2126281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	97.6	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A94887

Included Lab Sample IDs: 2126280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.5	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94889

Included Lab Sample IDs: 2126281

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94903

Included Lab Sample IDs: 2126281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	96.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94935

Included Lab Sample IDs: 2126281

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94966

Included Lab Sample IDs: 2126281

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A95003

Included Lab Sample IDs: 2126280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A95018

Included Lab Sample IDs: 2126280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	105	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A95018

Included Lab Sample IDs: 2126280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.5	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					11.3	
EPA 300.0 Rev. 2.1	Chloride	102	101	103		1.37	
	Sulfate	103	102	104		1.83	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	100	99.6			0.393
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	105	105			0.121
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	98.2	100	99.5			0.919
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	97.9	98.1			0.204
SM 2120 B	Color (true)	98.2				0.356	
SM 2320 B-97	Total Alkalinity	104				0.0264	
SM 2540 C-97	TDS					1.03	
SM 4500 F-C-97	Fluoride	94.5	94.4	93.9			0.474
SM 5310 B-00	Organic Carbon	99.8	97.8	107			5.61

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2126280
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2126280
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2126280
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2126281
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2126281
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2126281
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2126281
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2126282
SM 2120 B / E31780	True Color measured at 450 nm	2126280
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2126280
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2126280
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2126280
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2126280
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2126281

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	10/09/2019			10/09/2019 15:36	Rosalyn Ballman	2126280
EPA 300.0 Rev. 2.1	10/09/2019			10/15/2019 10:34	Jhamieka S. Greenwood	2126280
EPA 350.1 Rev. 2.0	10/09/2019			10/11/2019 13:53	Ping Hua	2126281
EPA 351.2 Rev. 2.0	10/09/2019	10/10/2019 12:57	Sima Feizi	10/11/2019 15:23	Jhamieka S. Greenwood	2126281
EPA 353.2 Rev. 2.0	10/09/2019			10/11/2019 09:42	Beverly Y. Sanders	2126281
EPA 365.1 Rev. 2.0	10/09/2019	10/10/2019 14:40	Lipi Saha	10/14/2019 16:27	Rosalyn Ballman	2126281
EPA 365.1 Rev. 2.0 dissolved	10/09/2019			10/09/2019 16:39	Julia Storbeck	2126282
SM 2120 B	10/09/2019			10/09/2019 13:02	Madeline Funaro	2126280
SM 2320 B-97	10/09/2019			10/12/2019 11:05	Dale L. Simmons	2126280
SM 2540 C-97	10/09/2019			10/11/2019 12:48	Yijie Li	2126280
SM 2540 D-97	10/09/2019			10/11/2019 12:48	Yijie Li	2126280
SM 4500 F-C-97	10/09/2019			10/12/2019 11:05	Dale L. Simmons	2126280
SM 5310 B-00	10/09/2019			10/10/2019 16:45	Madeline Funaro	2126281