

Chemical Analysis Report

CEN-DIST-2019-06-25-01

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

Event Description: **LAKE AURORA + LVI**
Request ID: **RQ-2019-06-24-27**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 10-JUL-2019 13:12



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: LAKE AURORA @ CENTER OF S LOBE

Collection Date/Time: 06/24/2019 12:30

Field ID: G4CE0172

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2097920	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P366304	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P366537	
		Sulfate	33	A	mg SO4/L	P366538	
	SM 2120 B	Color (true)	5.6	I	PCU	P366287	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P366445	RPD
	SM 2540 C-97	TDS	129	A	mg/L	P366617	
	SM 2540 D-97	TSS	2	UA	mg/L	P366609	
	SM 4500 F-C-97	Fluoride	0.048	I	mg F/L	P366583	
2097921	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P366548	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P366315	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P366436	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P366324	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P366422	
2097922	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P366291	

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: P366304

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366537

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366538

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366548

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366315

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366436

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P366324

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366291

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

Reference Method: SM 2120 B
Batch ID: P366287

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P366445

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

Reference Method: SM 2540 C-97
Batch ID: P366617

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P366609

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P366583

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P366422

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: P366537

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366538

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366548

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366315

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366436

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: P366324

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: P366291

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

Reference Method: SM 2120 B
Batch ID: P366287

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P366445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P366583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P366422

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097920	Chloride	102		P	90 - 110
2098211	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097920	Sulfate	101		P	90 - 110
2098211	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097479	Ammonia-N	106	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097921	Kjeldahl Nitrogen	107	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097921	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P366324

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097921	Total-P	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097922	O-Phosphate-P	94.4	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P366583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2098178	Fluoride	97.8	99.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P366422

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097838	Organic Carbon	92.5	91.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P366304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097837	Turbidity	4.08	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097920	Chloride	0.427	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P366538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097920	Sulfate	0.752	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097479	Ammonia-N	0.350	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097921	Kjeldahl Nitrogen	3.86	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097921	NO2NO3-N	0.388	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P366324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097921	Total-P	0.472	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097922	O-Phosphate-P	1.37	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P366287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097837	Color (true)	0.210	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P366445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2098178	Total Alkalinity	5.44	Sample	F	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P366617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097920	TDS	3.10	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P366583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2098178	Fluoride	0.979	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P366422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097838	Organic Carbon	0.757	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 300.0 Rev. 2.1

Run ID: A92336

Included Lab Sample IDs: 2097920

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

Reference Method: SM 2120 B

Run ID: A92345

Included Lab Sample IDs: 2097920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A92347

Included Lab Sample IDs: 2097922

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A92356

Included Lab Sample IDs: 2097920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	96.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A92397

Included Lab Sample IDs: 2097921

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A92400

Included Lab Sample IDs: 2097921

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	94.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A92403

Included Lab Sample IDs: 2097921

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

Reference Method: SM 5310 B-00

Run ID: A92406

Included Lab Sample IDs: 2097921

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.8	94.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A92417
Included Lab Sample IDs: 2097920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A92461
Included Lab Sample IDs: 2097921

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

Reference Method: SM 4500 F-C-97
Run ID: A92490
Included Lab Sample IDs: 2097920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.5	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					4.08	
EPA 300.0 Rev. 2.1	Chloride	101	102	101		0.427	
	Sulfate	101	101	101		0.752	
EPA 350.1 Rev. 2.0	Ammonia-N	106	106	106			0.350
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	107	102			3.86
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	101			0.388
EPA 365.1 Rev. 2.0	Total-P	103	99.0	99.5			0.472
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.0	94.4	95.7			1.37
SM 2120 B	Color (true)	101				0.210	
SM 2320 B-97	Total Alkalinity	103				5.44	
SM 2540 C-97	TDS					3.10	
SM 4500 F-C-97	Fluoride	98.0	97.8	99.1			0.979
SM 5310 B-00	Organic Carbon	95.2	92.5	91.7			0.757

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2097920
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2097920
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2097920
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2097921
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2097921
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2097921
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2097921
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2097922
SM 2120 B / E31780	True Color measured at 450 nm	2097920
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2097920
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2097920
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2097920
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2097920
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2097921

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	06/25/2019			06/25/2019 16:55	Adrian Shelby	2097920
EPA 300.0 Rev. 2.1	06/25/2019			06/28/2019 18:48	Jhamieka S. Greenwood	2097920
EPA 350.1 Rev. 2.0	06/25/2019			06/27/2019 13:28	Ping Hua	2097921
EPA 351.2 Rev. 2.0	06/25/2019	06/26/2019 11:25	Sima Feizi	06/27/2019 10:18	Joseph Suarez	2097921
EPA 353.2 Rev. 2.0	06/25/2019			06/27/2019 14:07	Beverly Y. Sanders	2097921
EPA 365.1 Rev. 2.0	06/25/2019	06/26/2019 12:15	Sima Feizi	06/27/2019 12:23	Lipi Saha	2097921
EPA 365.1 Rev. 2.0 dissolved	06/25/2019			06/25/2019 14:53	Jhamieka S. Greenwood	2097922
SM 2120 B	06/25/2019			06/25/2019 17:14	Julia Storbeck	2097920
SM 2320 B-97	06/25/2019			06/27/2019 09:34	Dale L. Simmons	2097920
SM 2540 C-97	06/25/2019			06/26/2019 15:02	Yijie Li	2097920
SM 2540 D-97	06/25/2019			06/26/2019 15:02	Yijie Li	2097920
SM 4500 F-C-97	06/25/2019			07/01/2019 22:40	Dale L. Simmons	2097920
SM 5310 B-00	06/25/2019			06/26/2019 09:50	Julia Storbeck	2097921