

Chemical Analysis Report

CEN-DIST-2019-10-29-01

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

Event Description: **Lk Waumpi + LVI**
Request ID: **RQ-2019-10-28-61**
Customer: **CEN-DIST**
Project ID: **SMP**

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

Date Certified: 15-NOV-2019 15:40

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: 1.3E+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 Waumpi @ Center

Collection Date/Time: 10/28/2019 11:25

Field ID: G2CE0224

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2132179	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P373362	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P373763	
		Sulfate	14		mg SO4/L	P373767	
	SM 2120 B	Color (true)	27	A	PCU	P373378	
	SM 2320 B-97	Total Alkalinity	50		mg CaCO3/L	P373971	
	SM 2540 C-97	TDS	111		mg/L	P373709	
	SM 2540 D-97	TSS	2	I	mg/L	P373520	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P373679	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P373543	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P373505	
2132180	EPA 353.2 Rev. 2.0	NO2NO3-N	0.047		mg N/L	P373437	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P373419	
	SM 5310 B-00	Organic Carbon	7.5		mg C/L	P373545	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P373371	
	dissolved						

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P373362

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373763

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373767

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373543

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373505

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373437

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373419

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373371

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

Reference Method: SM 2120 B
Batch ID: P373378

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P373971

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

Reference Method: SM 2540 C-97
Batch ID: P373709

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P373520

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P373679

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P373545

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: P373763

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373767

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373505

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373437

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: P373419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373371

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

Reference Method: SM 2120 B
Batch ID: P373378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P373971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P373679

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P373545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132005	Chloride	99.7	100	P/P	90 - 110
2132184	Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132005	Sulfate	100	101	P/P	90 - 110
2132184	Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132185	Ammonia-N	98.8	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132180	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132050	NO2NO3-N	99.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132185	Total-P	95.3	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373371

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132181	O-Phosphate-P	98.3	97.8	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P373545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2132180	Organic Carbon	99.4	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P373362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132090	Turbidity	5.38	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132005	Chloride	0.391	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132005	Sulfate	1.02	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132185	Ammonia-N	0.242	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132180	Kjeldahl Nitrogen	0.924	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132050	NO2NO3-N	0.193	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132185	Total-P	2.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132181	O-Phosphate-P	0.510	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P373378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132179	Color (true)	0.144	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P373971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132775	Total Alkalinity	0.249	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P373709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132184	TDS	3.02	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P373679

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132444	Fluoride	0.939	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P373545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2132180	Organic Carbon	0.983	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: A95314

Included Lab Sample IDs: 2132179

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95318

Included Lab Sample IDs: 2132181

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.9	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A95320

Included Lab Sample IDs: 2132179

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	101	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95355

Included Lab Sample IDs: 2132180

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95381

Included Lab Sample IDs: 2132180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95386

Included Lab Sample IDs: 2132180

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

Reference Method: SM 5310 B-00

Run ID: A95387

Included Lab Sample IDs: 2132180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	108	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95416

Included Lab Sample IDs: 2132180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.7	98.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A95466

Included Lab Sample IDs: 2132179

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A95511

Included Lab Sample IDs: 2132179

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

Reference Method: SM 2320 B-97

Run ID: A95613

Included Lab Sample IDs: 2132179

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					5.38	
EPA 300.0 Rev. 2.1	Chloride	102	99.7	100	98.2		0.391
	Sulfate	101	100	101	99.3		1.02
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	98.8	99.1			0.242
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	105	104			0.924
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.2				0.193
EPA 365.1 Rev. 2.0	Total-P	98.3	95.3	98.2			2.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	98.3	97.8			0.510
SM 2120 B	Color (true)	98.9				0.144	
SM 2320 B-97	Total Alkalinity	100				0.249	
SM 2540 C-97	TDS					3.02	
SM 4500 F-C-97	Fluoride	101					0.939
SM 5310 B-00	Organic Carbon	104	99.4	101			0.983

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2132179
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2132179
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2132179
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2132180
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2132180
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2132180
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2132180
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2132181
SM 2120 B / E31780	True Color measured at 450 nm	2132179
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2132179
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2132179
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2132179
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2132179
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2132180

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	10/29/2019			10/29/2019 15:54	Rosalyn Ballman	2132179
EPA 300.0 Rev. 2.1	10/29/2019			11/05/2019 12:14	Jhamieka S. Greenwood	2132179
EPA 350.1 Rev. 2.0	10/29/2019			10/31/2019 13:54	Ping Hua	2132180
EPA 351.2 Rev. 2.0	10/29/2019	10/31/2019 12:35	Sima Feizi	11/01/2019 15:40	Jhamieka S. Greenwood	2132180
EPA 353.2 Rev. 2.0	10/29/2019			10/30/2019 12:01	Beverly Y. Sanders	2132180
EPA 365.1 Rev. 2.0	10/29/2019	10/30/2019 11:09	Vijayalakshmi Reddy	10/31/2019 15:18	Julia Storbeck	2132180
EPA 365.1 Rev. 2.0 dissolved	10/29/2019			10/29/2019 15:20	Virginia P. Brown	2132181
SM 2120 B	10/29/2019			10/29/2019 17:41	Madeline Funaro	2132179
SM 2320 B-97	10/29/2019			11/08/2019 09:24	Dale L. Simmons	2132179
SM 2540 C-97	10/29/2019			10/30/2019 15:03	Yijie Li	2132179
SM 2540 D-97	10/29/2019			10/30/2019 15:03	Yijie Li	2132179
SM 4500 F-C-97	10/29/2019			11/01/2019 17:15	Dale L. Simmons	2132179
SM 5310 B-00	10/29/2019			10/31/2019 14:25	Lauren Lees	2132180