Chemical Analysis Report

CEN-DIST-2016-04-20-01

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

Event Description: **Lake Wales+LVI**
Request ID: **RQ-2016-04-18-29**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 12-MAY-2016 16:17

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: LAKE WALES @ CENTER **Collection Date/Time: 04/19/2016 13:28**

Field ID: G4CE0110 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1790657	EPA 180.1 Rev. 2.0	Turbidity	3.5	A	NTU	P302623	
	EPA 300.0 Rev. 2.1	Chloride	9.4		mg Cl/L	P302871	
		Sulfate	11		mg SO4/L	P302873	
	SM 2120 B	Color (true)	12		PCU	P302593	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P302990	
	SM 2540 C-97	TDS	89		mg/L	P303352	
	SM 2540 D-97	TSS	8	I	mg/L	P303212	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P302993	
1790658	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P303368	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P303456	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303001	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P303670	
	SM 5310 B-00	Organic Carbon	6.4		mg C/L	P303343	
1790659	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302614	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P302623

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302871

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302873

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303368

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303456

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: P303001

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303670

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302614

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

Reference Method: SM 2120 B
Batch ID: P302593

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P302990

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

Reference Method: SM 2540 C-97
Batch ID: P303352

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P303212

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P302993

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P303343

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: P302871

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303368

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303456

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303001

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303670

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302614

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

Reference Method: SM 2320 B-97
Batch ID: P302990

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.6		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P302993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P303343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790388	Chloride	99.4		P	90 - 110
1790394	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790388	Sulfate	97.4		P	90 - 110
1790394	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790649	Ammonia-N	99.0	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790567	Kjeldahl Nitrogen	85.8	90.5	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303001

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790649	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790658	Total-P	101	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790659	O-Phosphate-P	94.5	94.9	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P302993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790392	Fluoride	97.3	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P303343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790568	Organic Carbon	96.0	96.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P302623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790657	Turbidity	0.570	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790388	Chloride	0.234	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790388	Sulfate	0.205	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790649	Ammonia-N	1.33	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790567	Kjeldahl Nitrogen	4.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303001

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: P303001

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790649	NO2NO3-N	1.47	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303670

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790658	Total-P	4.99	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302614

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790659	O-Phosphate-P	0.422	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P302593

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790663	Color (true)	1.66	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P302990

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790392	Total Alkalinity	1.75	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P303352

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790663	TDS	6.20	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P302993

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790392	Fluoride	1.48	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P303343

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790568	Organic Carbon	0.829	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: EPA 300.0 Rev. 2.1
Run ID: A68939
Included Lab Sample IDs: 1790657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	99.7	P/P	90 - 110
Sulfate	98.9	93.6	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A68985
Included Lab Sample IDs: 1790657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.9	99.6	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68990
Included Lab Sample IDs: 1790659

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68992
Included Lab Sample IDs: 1790657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A69105
Included Lab Sample IDs: 1790658

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

Reference Method: SM 2320 B-97
Run ID: A69110
Included Lab Sample IDs: 1790657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A69110
Included Lab Sample IDs: 1790657

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A69207
Included Lab Sample IDs: 1790658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	98.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A69209
Included Lab Sample IDs: 1790658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A69327
Included Lab Sample IDs: 1790658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.4	96.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A69361
Included Lab Sample IDs: 1790658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.8	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					0.570	
EPA 300.0 Rev. 2.1	Chloride	100	101	99.4		0.234	
	Sulfate	99.2	97.4	97.1		0.205	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	99.0	101			1.33
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	85.8	90.5			4.23
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102			1.47
EPA 365.1 Rev. 2.0	Total-P	97.5	101	95.7			4.99
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	94.5	94.9			0.422
SM 2120 B	Color (true)					1.66	
SM 2320 B-97	Total Alkalinity	98.6				1.75	
SM 2540 C-97	TDS					6.20	
SM 4500 F-C-97	Fluoride	96.2	97.3	99.0			1.48
SM 5310 B-00	Organic Carbon	96.4	96.0	96.8			0.829

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1790657
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1790657
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1790657
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1790658
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1790658
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1790658
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1790658
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1790659
SM 2120 B / E31780	True Color measured at 450 nm	1790657
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1790657
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1790657
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1790657
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1790657
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1790658

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	04/20/2016			04/20/2016 14:20	Sima Feizi	1790657
EPA 300.0 Rev. 2.1	04/20/2016			04/23/2016	Julia Storbeck	1790657
EPA 350.1 Rev. 2.0	04/20/2016			05/02/2016	Diana M. Turner	1790658
EPA 351.2 Rev. 2.0	04/20/2016	05/04/2016	Sofia Elnemr	05/06/2016	Christopher Armour	1790658
EPA 353.2 Rev. 2.0	04/20/2016			04/26/2016	Peter D. Kaus	1790658
EPA 365.1 Rev. 2.0	04/20/2016	05/06/2016	Vijayalakshmi Reddy	05/09/2016	Lipi Saha	1790658
EPA 365.1 Rev. 2.0 dissolved	04/20/2016			04/20/2016 13:34	Ping Hua	1790659
SM 2120 B	04/20/2016			04/20/2016 12:51	Rochelle Y Jackson	1790657
SM 2320 B-97	04/20/2016			04/26/2016	Dale L. Simmons	1790657
SM 2540 C-97	04/20/2016			04/22/2016	Yijie Li	1790657
SM 2540 D-97	04/20/2016			04/22/2016	Yijie Li	1790657
SM 4500 F-C-97	04/20/2016			04/26/2016	Dale L. Simmons	1790657
SM 5310 B-00	04/20/2016			04/29/2016	Sofia Elnemr	1790658