Chemical Analysis Report

CEN-DIST-2016-01-21-02

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

Event Description: **Rainbow River+SCI**
Request ID: **RQ-2016-01-18-30**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
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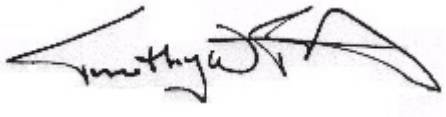
Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 09-FEB-2016 11:46



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: REEDY CREEK @ 0.78 MILES NORTH IF RCID L-410 CANAL **Collection Date/Time: 01/20/2016 12:14**

Field ID: G4CE0084_26011072 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764425	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P297387	
	EPA 300.0 Rev. 2.1	Chloride	51		mg Cl/L	P297815	
		Sulfate	14		mg SO4/L	P297775	
	SM 2120 B	Color (true)	420		PCU	P297398	
	SM 2320 B-97	Total Alkalinity	25		mg CaCO3/L	P297687	
	SM 2540 C-97	TDS	218		mg/L	P298059	
	SM 2540 D-97	TSS	2	U	mg/L	P297893	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P297674	
1764426	EPA 350.1 Rev. 2.0	Ammonia-N	0.067		mg N/L	P297794	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P297572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P297725	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P297700	
	SM 5310 B-00	Organic Carbon	36		mg C/L	P297729	
1764427	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P297391	

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: P297387

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297794

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297572

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: P297725

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297700

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297391

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

Reference Method: SM 2120 B
Batch ID: P297398

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P297687

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

Reference Method: SM 2540 C-97
Batch ID: P298059

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P297893

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P297674

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P297729

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: P297775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	109		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297794

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297572

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: P297725

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: P297700

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297391

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

Reference Method: SM 2320 B-97
Batch ID: P297687

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

Reference Method: SM 4500 F-C-97
Batch ID: P297674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	94 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P297729

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764364	Sulfate	104		P	90 - 110
1764425	Sulfate	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765664	Chloride	99.8		P	90 - 110
1765665	Chloride	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764449	Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764385	Kjeldahl Nitrogen	103	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764466	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764416	Total-P	99.3	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297391

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764388	O-Phosphate-P	103	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P297674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764958	Fluoride	97.5	98.1	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P297729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764360	Organic Carbon	95.3		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764357	Turbidity	1.75	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764364	Sulfate	0.255	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765664	Chloride	0.0691	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764449	Ammonia-N	1.22	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764385	Kjeldahl Nitrogen	0.261	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297725

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: P297725

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764466	NO2NO3-N	0.613	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297700

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764416	Total-P	1.07	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297391

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764388	O-Phosphate-P	0.291	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P297398

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764411	Color (true)	0.268	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P297687

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764958	Total Alkalinity	0.675	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P298059

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764364	TDS	0.851	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P297674

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764958	Fluoride	0.476	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P297729

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764360	Organic Carbon	0.671	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: A67199
Included Lab Sample IDs: 1764425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A67200
Included Lab Sample IDs: 1764427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	98.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A67201
Included Lab Sample IDs: 1764425

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67286
Included Lab Sample IDs: 1764425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	102	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A67312
Included Lab Sample IDs: 1764425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A67314
Included Lab Sample IDs: 1764425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A67325
Included Lab Sample IDs: 1764426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67329
Included Lab Sample IDs: 1764426

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

Reference Method: SM 5310 B-00
Run ID: A67330
Included Lab Sample IDs: 1764426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.3	93.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67335
Included Lab Sample IDs: 1764426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.6	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A67351
Included Lab Sample IDs: 1764426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	104	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					1.75	
EPA 300.0 Rev. 2.1	Chloride	101	99.8	99.1		0.0691	
	Sulfate	109	104	105		0.255	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	101			1.22
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	103	103			0.261
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102			0.613
EPA 365.1 Rev. 2.0	Total-P	98.9	99.3	100			1.07
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	103	103			0.291
SM 2120 B	Color (true)					0.268	
SM 2320 B-97	Total Alkalinity	100				0.675	
SM 2540 C-97	TDS					0.851	
SM 4500 F-C-97	Fluoride	96.9	97.5	98.1			0.476
SM 5310 B-00	Organic Carbon	92.5	95.3				0.671

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	1764425
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1764425
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1764425
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1764426
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1764426
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1764426
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1764426
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1764427
SM 2120 B / E31780	True Color measured at 450 nm	1764425
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1764425
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1764425
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1764425
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1764425
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1764426

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	01/21/2016			01/21/2016 13:04	Sima Feizi	1764425
EPA 300.0 Rev. 2.1	01/21/2016			01/28/2016	Ping Hua	1764425
	01/21/2016			01/29/2016	Ping Hua	1764425
EPA 350.1 Rev. 2.0	01/21/2016			01/28/2016	Diana M. Turner	1764426
EPA 351.2 Rev. 2.0	01/21/2016	01/27/2016	Christopher Armour	01/28/2016	Bryan A. Werth	1764426
EPA 353.2 Rev. 2.0	01/21/2016			01/28/2016	Peter D. Kaus	1764426
EPA 365.1 Rev. 2.0	01/21/2016	01/28/2016	Christopher Armour	01/28/2016	Lipi Saha	1764426
EPA 365.1 Rev. 2.0 dissolved	01/21/2016			01/21/2016 15:35	Julia Storbeck	1764427
SM 2120 B	01/21/2016			01/21/2016 15:43	Rochelle Y Jackson	1764425
SM 2320 B-97	01/21/2016			01/27/2016	Dale L. Simmons	1764425
SM 2540 C-97	01/21/2016			01/26/2016	Sima Feizi	1764425
SM 2540 D-97	01/21/2016			01/26/2016	Sima Feizi	1764425
SM 4500 F-C-97	01/21/2016			01/27/2016	Dale L. Simmons	1764425
SM 5310 B-00	01/21/2016			01/27/2016	Sofia Elnemr	1764426