Chemical Analysis Report

CEN-DIST-2016-09-13-02

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

Event Description: **Spruce Creek C/Rose Bay B**
Request ID: **RQ-2016-09-12-87**
Customer: **CEN-DIST**
Project ID: **SMP**

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3319 Maguire Blvd., Suite 232
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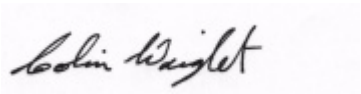
Certified by: Colin Wright, Environmental Administrator

Date Certified: 05-OCT-2016 09:42



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 groups are included in this report: Metals and 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: Rose Bay @ 125m NE of Boat Ramp **Collection Date/Time: 09/12/2016 11:30**

Field ID: G5CE0073 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830669	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P311086	
	SM 2320 B-97	Total Alkalinity	133		mg CaCO3/L	P311452	
	SM 2540 D-97	TSS	28		mg/L	P311506	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P311627	
1830671	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P311269	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P311201	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311697	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P311482	
	SM 5310 B-00	Organic Carbon	7.0		mg C/L	P311164	
1830673	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P311067	

Sample Location: Rose Bay @ U.S. 1 **Collection Date/Time: 09/12/2016 12:00**

Field ID: G5CE0038 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830670	EPA 180.1 Rev. 2.0	Turbidity	7.7		NTU	P311086	
	SM 2320 B-97	Total Alkalinity	135		mg CaCO3/L	P311452	
	SM 2540 D-97	TSS	14	A	mg/L	P311506	
	SM 4500 F-C-97	Fluoride	1.0		mg F/L	P311627	
1830672	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P311269	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P311201	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311697	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P311482	
	SM 5310 B-00	Organic Carbon	7.6		mg C/L	P311164	
1830674	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.054		mg P/L	P311067	

Sample Location: Spruce Creek @ Airport Rd **Collection Date/Time: 09/12/2016 13:00**

Field ID: G5CE0072 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830675	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P311086	
	EPA 300.0 Rev. 2.1	Chloride	2.6E+03		mg Cl/L	P311403	
		Sulfate	380		mg SO4/L	P311409	
	SM 2120 B	Color (true)	41		PCU	P311036	
	SM 2320 B-97	Total Alkalinity	182		mg CaCO3/L	P311452	
	SM 2540 C-97	TDS	4.63E+03		mg/L	P311522	
	SM 2540 D-97	TSS	4	I	mg/L	P311502	
	SM 4500 F-C-97	Fluoride	0.26		mg F/L	P311625	
1830676	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P311269	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P311201	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311697	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P311482	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P311341	

Field ID: G5CE0072 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830677	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P311067	
1830681	EPA 200.7 Rev. 4.4	Iron	240		ug/L	P311144	
		Magnesium	182		mg/L	P311144	
		Potassium	53		mg/L	P311144	
		Sodium	1.43E+03		mg/L	P311144	
	EPA 200.8 Rev. 5.4	Arsenic	1.18		ug/L	P311144	
		Cadmium	0.060	U	ug/L	P311144	
		Chromium	0.25	I	ug/L	P311144	
		Copper	0.61	I	ug/L	P311144	
		Lead	0.15	U	ug/L	P311144	
		Nickel	0.29	I	ug/L	P311144	
		Silver	0.015	U	ug/L	P311144	
		Zinc	3.0	U	ug/L	P311144	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 8740 mhos/cm.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for magnesium, potassium, and sodium 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: P311086

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Component	Result	Code	Units
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311403

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311409

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311269

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311201

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311067

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

Reference Method: SM 2120 B
Batch ID: P311036

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311452

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P311522

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311502

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311506

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P311625

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311164

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P311341

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	102		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.1		P	85 - 115
Sodium	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.3		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	95.8		P	85 - 115
Lead	96.3		P	85 - 115
Nickel	95.6		P	85 - 115
Silver	98.1		P	85 - 115
Zinc	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311403

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311409

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311269

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311201

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

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: P311482

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: P311067

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P311452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P311625

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P311164

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

Reference Method: SM 5310 B-00
Batch ID: P311341

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830681	Iron	101	102	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830681	Arsenic	108	106	P/P	70 - 130
1830681	Cadmium	105	101	P/P	70 - 130
1830681	Chromium	96.0	94.7	P/P	70 - 130
1830681	Copper	95.3	93.7	P/P	70 - 130
1830681	Lead	104	104	P/P	70 - 130
1830681	Nickel	97.6	95.9	P/P	70 - 130
1830681	Silver	94.5	93.6	P/P	70 - 130
1830681	Zinc	97.5	95.5	P/P	70 - 130

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830659	Chloride	98.5		P	90 - 110
1830660	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830659	Sulfate	99.2		P	90 - 110
1830660	Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311269

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830671	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311201

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830676	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830087	NO2NO3-N	101	103	P/P	90 - 110
1830087	NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830073	Total-P	91.4	91.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830673	O-Phosphate-P	98.8	97.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311625

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830675	Fluoride	95.8	98.1	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831182	Fluoride	97.0	97.0	P/P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P311164

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826897	Organic Carbon	95.2	96.4	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P311341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830573	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830669	Turbidity	7.14	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830681	Iron	0.524	Spike	P	0 - 20
1830681	Magnesium	2.61	Spike	P	0 - 20
1830681	Potassium	0.0976	Spike	P	0 - 20
1830681	Sodium	0.153	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830681	Arsenic	1.82	Spike	P	0 - 20
1830681	Cadmium	3.34	Spike	P	0 - 20
1830681	Chromium	1.40	Spike	P	0 - 20
1830681	Copper	1.64	Spike	P	0 - 20
1830681	Lead	0.316	Spike	P	0 - 20
1830681	Nickel	1.76	Spike	P	0 - 20
1830681	Silver	0.963	Spike	P	0 - 20
1830681	Zinc	2.03	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830659	Chloride	0.193	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830659	Sulfate	0.265	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830671	Ammonia-N	1.19	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830676	Kjeldahl Nitrogen	2.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830087	NO2NO3-N	0.776	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830073	Total-P	0.464	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830673	O-Phosphate-P	0.868	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P311036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830634	Color (true)	4.77	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831182	Total Alkalinity	0.284	Sample	P	0 - 4.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P311522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830634	TDS	2.56	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P311506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830670	TSS	8.70	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311625

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830675	Fluoride	1.40	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831182	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P311164

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826897	Organic Carbon	1.10	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P311341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830573	Organic Carbon	0.480	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: A71576
Included Lab Sample IDs: 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	101	97.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A71581
Included Lab Sample IDs: 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	94.6	95.0	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71595
Included Lab Sample IDs: 1830673, 1830674, 1830677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.9	P/P	90 - 110
O-Phosphate-P	99.3	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71599
Included Lab Sample IDs: 1830669, 1830670, 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: SM 5310 B-00
Run ID: A71630
Included Lab Sample IDs: 1830671, 1830672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71658
Included Lab Sample IDs: 1830671, 1830672, 1830676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71682
Included Lab Sample IDs: 1830676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	107	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71691
Included Lab Sample IDs: 1830671, 1830672, 1830676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	101	P/P	90 - 110
Kjeldahl Nitrogen	99.9	99.1	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A71720
Included Lab Sample IDs: 1830669, 1830670, 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A71720
Included Lab Sample IDs: 1830669, 1830670, 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71721
Included Lab Sample IDs: 1830681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.8	99.5	P/P	90 - 110
Cadmium	99.8	98.3	P/P	90 - 110
Chromium	101	99.7	P/P	90 - 110
Copper	95.6	97.1	P/P	90 - 110
Lead	94.8	94.2	P/P	90 - 110
Nickel	95.6	97.3	P/P	90 - 110
Silver	95.5	96.2	P/P	90 - 110
Zinc	98.2	98.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71744
Included Lab Sample IDs: 1830681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	98.6	P/P	90 - 110
Magnesium	102	101	P/P	95 - 105
Potassium	99.7	99.6	P/P	95 - 105
Sodium	100	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71755
Included Lab Sample IDs: 1830671, 1830676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.6	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71756
Included Lab Sample IDs: 1830672

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

Reference Method: SM 4500 F-C-97
Run ID: A71764
Included Lab Sample IDs: 1830669, 1830670, 1830675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	100	P/P	90 - 110
Fluoride	99.5	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71785
Included Lab Sample IDs: 1830671, 1830672, 1830676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110
NO2NO3-N	101	100	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					7.14		
EPA 200.7 Rev. 4.4	Iron	102	101	102			0.524	
	Magnesium	102					2.61	
	Potassium	99.1					0.0976	
	Sodium	101					0.153	
EPA 200.8 Rev. 5.4	Arsenic	98.3	108	106			1.82	
	Cadmium	101	105	101			3.34	
	Chromium	101	96.0	94.7			1.40	
	Copper	95.8	95.3	93.7			1.64	
	Lead	96.3	104	104			0.316	
	Nickel	95.6	97.6	95.9			1.76	
	Silver	98.1	94.5	93.6			0.963	
	Zinc	98.7	97.5	95.5			2.03	
EPA 300.0 Rev. 2.1	Chloride	100	98.5	98.5		0.193		
	Sulfate	98.6	99.2	98.1		0.265		
EPA 350.1 Rev. 2.0	Ammonia-N	94.9	101	102			1.19	
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.9	100	103			2.28	
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	103	103		0.776	RSD
EPA 365.1 Rev. 2.0	Total-P	103	91.4	91.0			0.464	
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.8	97.6			0.868	
SM 2120 B	Color (true)					4.77		
SM 2320 B-97	Total Alkalinity	104				0.284		
SM 2540 C-97	TDS					2.56		
SM 2540 D-97	TSS					8.70		
SM 4500 F-C-97	Fluoride	98.4	95.8	98.1			1.40	
	Fluoride	98.4	97.0	97.0			0.0	
SM 5310 B-00	Organic Carbon	107	95.2	96.4			1.10	
	Organic Carbon	104	102	103			0.480	

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1830669, 1830670, 1830675
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1830681
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1830681

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1830675
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1830675
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1830671, 1830672, 1830676
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1830671, 1830672, 1830676
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1830671, 1830672, 1830676
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1830671, 1830672, 1830676
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1830673, 1830674, 1830677
SM 2120 B / E31780	True Color measured at 450 nm	1830675
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1830669, 1830670, 1830675
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1830675
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1830669, 1830670, 1830675
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1830669, 1830670, 1830675
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1830671, 1830672, 1830676

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	09/13/2016			09/13/2016 16:45	Sima Feizi	1830669, 1830670, 1830675
EPA 200.7 Rev. 4.4	09/13/2016	09/14/2016	Elliott D. Healy	09/20/2016	Joshua Ayres	1830681
EPA 200.8 Rev. 5.4	09/13/2016	09/14/2016	Elliott D. Healy	09/19/2016	Charles J. Peterson	1830681
EPA 300.0 Rev. 2.1	09/13/2016			09/17/2016	Ping Hua	1830675
EPA 350.1 Rev. 2.0	09/13/2016			09/14/2016	Joseph Suarez	1830671, 1830672, 1830676
EPA 351.2 Rev. 2.0	09/13/2016	09/15/2016	Adrian Shelby	09/16/2016	Virginia P. Brown	1830671, 1830672, 1830676
EPA 353.2 Rev. 2.0	09/13/2016			09/21/2016	Beverly Y. Sanders	1830671, 1830672, 1830676
EPA 365.1 Rev. 2.0	09/13/2016	09/20/2016	Lipi Saha	09/21/2016	Lipi Saha	1830671, 1830672, 1830676
EPA 365.1 Rev. 2.0 dissolved	09/13/2016			09/13/2016 17:59	Julia Storbeck	1830673
	09/13/2016			09/13/2016 18:58	Julia Storbeck	1830674
	09/13/2016			09/13/2016 18:59	Julia Storbeck	1830677
SM 2120 B	09/13/2016			09/13/2016 15:14	Julie Michelle Frank	1830675
SM 2320 B-97	09/13/2016			09/19/2016	Dale L. Simmons	1830669, 1830670, 1830675
SM 2540 C-97	09/13/2016			09/15/2016	Yijie Li	1830675
SM 2540 D-97	09/13/2016			09/15/2016	Yijie Li	1830669, 1830670, 1830675
SM 4500 F-C-97	09/13/2016			09/21/2016	Dale L. Simmons	1830669, 1830670, 1830675
SM 5310 B-00	09/13/2016			09/15/2016	Sofia Elnemr	1830671, 1830672
	09/13/2016			09/16/2016	Sofia Elnemr	1830676