

Chemical Analysis Report

CEN-DIST-2016-11-09-01

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

Event Description: **Strickland D/Turnbull B/Spruce C/Rose Bx2**

Request ID: **RQ-2016-11-07-83**

Customer: **CEN-DIST**

Project ID: **SMP**

Send Reports to:

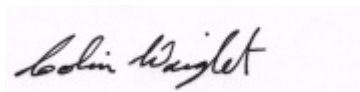
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact

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Phone (850) 245-8085

Certified by: Colin Wright, Environmental Administrator

Date Certified: 02-DEC-2016 15:41

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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 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: Spruce Creek @ Airport Rd

Collection Date/Time: 11/08/2016 11:05

Field ID: G5CE0072

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848644	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P314903	
	EPA 300.0 Rev. 2.1	Chloride	620		mg Cl/L	P315411	
		Sulfate	82		mg SO4/L	P315414	
	SM 2120 B	Color (true)	150		PCU	P314942	
	SM 2320 B-97	Total Alkalinity	170		mg CaCO3/L	P315137	
	SM 2540 C-97	TDS	1.24E+03		mg/L	P315527	
	SM 2540 D-97	TSS	2	I	mg/L	P315494	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P315141	
1848645	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P315195	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P315794	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.046		mg N/L	P315285	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P315327	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P314973	
1848646	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P314894	
1848648	EPA 200.7 Rev. 4.4	Calcium	74.5		mg/L	P314911	
		Iron	1.01E+03		ug/L	P314911	
		Magnesium	41.9		mg/L	P314911	
		Potassium	12.9		mg/L	P314911	
		Sodium	331		mg/L	P314911	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P314911	
		Arsenic	0.90		ug/L	P314911	
		Cadmium	0.020	U	ug/L	P314911	
		Chromium	0.41		ug/L	P314911	
		Copper	0.49		ug/L	P314911	
		Lead	0.13	I	ug/L	P314911	
		Nickel	0.33		ug/L	P314911	
		Silver	0.0050	U	ug/L	P314911	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

SM 5310 B-00: 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: P314903

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P314911

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P314911

Component	Result	Code	Units
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P314911

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315411

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315414

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315195

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315794

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315285

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315327

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P314894

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

Reference Method: SM 2120 B
 Batch ID: P314942

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P315137

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

Reference Method: SM 2540 C-97
 Batch ID: P315527

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P315494

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P315141

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P314973

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: P314911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	106		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	104		P	85 - 115
Sodium	102		P	85 - 115
Zinc	97.2		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P314911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.7		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	96.6		P	85 - 115
Copper	96.2		P	85 - 115
Lead	95.5		P	85 - 115
Nickel	99.2		P	85 - 115
Silver	95.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315411

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315414

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315195

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315794

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: P315285

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315327

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314894

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P315137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P314973

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P314911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848181	Calcium	108		P	80 - 120
1848181	Iron	107		P	80 - 120
1848181	Magnesium	110		P	80 - 120
1848181	Potassium	105		P	80 - 120
1848181	Sodium	99.9		P	80 - 120
1848181	Zinc	100		P	80 - 120
1848642	Calcium	104		P	80 - 120
1848642	Iron	109	110	P/P	80 - 120
1848642	Magnesium	111	111	P/P	80 - 120
1848642	Potassium	99.7	104	P/P	80 - 120
1848642	Sodium	103		P	80 - 120
1848642	Zinc	101	99.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P314911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848181	Arsenic	97.8		P	80 - 120
1848181	Cadmium	98.2		P	80 - 120
1848181	Chromium	97.7		P	80 - 120
1848181	Copper	95.0		P	80 - 120
1848181	Lead	96.1		P	80 - 120
1848181	Nickel	96.6		P	80 - 120
1848181	Silver	95.1		P	80 - 120
1848642	Arsenic	98.7	96.9	P/P	80 - 120
1848642	Cadmium	102	99.0	P/P	80 - 120
1848642	Chromium	100	97.9	P/P	80 - 120
1848642	Copper	95.1	93.2	P/P	80 - 120
1848642	Lead	99.6	96.5	P/P	80 - 120
1848642	Nickel	95.3	93.5	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P314911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848642	Silver	96.4	95.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848593	Chloride	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846165	Sulfate	97.6		P	90 - 110
1848593	Sulfate	93.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315195

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848645	Ammonia-N	103	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848724	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1847554	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315327

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848615	Total-P	95.9	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848597	O-Phosphate-P	94.0	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P315141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848239	Fluoride	98.6	100	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P314903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848613	Turbidity	0.185	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P314911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848642	Calcium	2.94	Spike	P	0 - 20
1848642	Iron	0.748	Spike	P	0 - 20
1848642	Magnesium	0.284	Spike	P	0 - 20
1848642	Potassium	3.22	Spike	P	0 - 20
1848642	Sodium	0.746	Spike	P	0 - 20
1848642	Zinc	0.905	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P314911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848642	Arsenic	1.28	Spike	P	0 - 20
1848642	Cadmium	3.37	Spike	P	0 - 20
1848642	Chromium	2.24	Spike	P	0 - 20
1848642	Copper	2.07	Spike	P	0 - 20
1848642	Lead	3.23	Spike	P	0 - 20
1848642	Nickel	1.84	Spike	P	0 - 20
1848642	Silver	1.13	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846165	Chloride	0.122	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846165	Sulfate	1.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848645	Ammonia-N	1.76	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848724	Kjeldahl Nitrogen	0.333	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847554	NO2NO3-N	0.257	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315327

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848615	Total-P	0.534	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848597	O-Phosphate-P	2.08	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P314942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848639	Color (true)	14.6	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848239	Total Alkalinity	0.0614	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P315527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848493	TDS	7.37	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848239	Fluoride	1.54	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P314973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848594	Organic Carbon	2.76	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 365.1 Rev. 2.0 dissolved
Run ID: A72731
Included Lab Sample IDs: 1848646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	97.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72735
Included Lab Sample IDs: 1848644

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

Reference Method: SM 2120 B
Run ID: A72748
Included Lab Sample IDs: 1848644

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	85 - 115

Reference Method: SM 5310 B-00
Run ID: A72755
Included Lab Sample IDs: 1848645

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	94.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A72793
Included Lab Sample IDs: 1848648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	100	100	P/P	90 - 110
Sodium	99.9	99.6	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A72801
Included Lab Sample IDs: 1848644

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

Reference Method: SM 4500 F-C-97
Run ID: A72801
Included Lab Sample IDs: 1848644

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A72803
Included Lab Sample IDs: 1848648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.5	95.3	P/P	90 - 110
Cadmium	96.2	95.5	P/P	90 - 110
Chromium	95.3	95.2	P/P	90 - 110
Copper	93.1	92.5	P/P	90 - 110
Lead	92.4	92.0	P/P	90 - 110
Nickel	94.8	93.6	P/P	90 - 110
Silver	93.6	92.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A72816
Included Lab Sample IDs: 1848645

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A72830
Included Lab Sample IDs: 1848644

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	99.5	P/P	90 - 110
Sulfate	97.5	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A72842
Included Lab Sample IDs: 1848645

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: A72917
Included Lab Sample IDs: 1848645

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73061

Included Lab Sample IDs: 1848645

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	105	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.185	
EPA 200.7 Rev. 4.4	Calcium	104	108 104			2.94
	Iron	106	107 109 110			0.748
	Magnesium	110	110 111 111			0.284
	Potassium	104	105 99.7 104			3.22
	Sodium	102	99.9 103			0.746
	Zinc	97.2	100 101 99.8			0.905
EPA 200.8 Rev. 5.4	Arsenic	98.7	97.8 98.7 96.9			1.28
	Cadmium	98.5	98.2 102 99.0			3.37
	Chromium	96.6	97.7 100 97.9			2.24
	Copper	96.2	95.0 95.1 93.2			2.07
	Lead	95.5	96.1 99.6 96.5			3.23
	Nickel	99.2	96.6 95.3 93.5			1.84
	Silver	95.0	95.1 96.4 95.3			1.13
EPA 300.0 Rev. 2.1	Chloride	102	98.1		0.122	
	Sulfate	98.8	97.6 93.8		1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	101	103 99.6			1.76
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	103 102			0.333
EPA 353.2 Rev. 2.0	NO2NO3-N	103	104 104			0.257
EPA 365.1 Rev. 2.0	Total-P	95.1	95.9 96.4			0.534
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	94.0 96.2			2.08
SM 2120 B	Color (true)				14.6	
SM 2320 B-97	Total Alkalinity	102			0.0614	
SM 2540 C-97	TDS				7.37	
SM 4500 F-C-97	Fluoride	98.1	98.6 100			1.54
SM 5310 B-00	Organic Carbon	95.8				2.76

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1848644
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1848648
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1848648
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1848644

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1848644
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1848645
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1848645
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1848645
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1848645
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1848646
SM 2120 B / E31780	True Color measured at 450 nm	1848644
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1848644
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1848644
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1848644
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1848644
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1848645

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	11/09/2016			11/09/2016 16:14	Julie Michelle Frank	1848644
EPA 200.7 Rev. 4.4	11/09/2016	11/09/2016	Elliott D. Healy	11/14/2016	Joshua Ayres	1848648
EPA 200.8 Rev. 5.4	11/09/2016	11/09/2016	Elliott D. Healy	11/12/2016	Charles J. Peterson	1848648
EPA 300.0 Rev. 2.1	11/09/2016			11/17/2016	Ping Hua	1848644
EPA 350.1 Rev. 2.0	11/09/2016			11/15/2016	Julie Michelle Frank	1848645
EPA 351.2 Rev. 2.0	11/09/2016	11/29/2016	Adrian Shelby	11/29/2016	Joseph Suarez	1848645
EPA 353.2 Rev. 2.0	11/09/2016			11/16/2016	Beverly Y. Sanders	1848645
EPA 365.1 Rev. 2.0	11/09/2016	11/17/2016	Christopher Armour	11/18/2016	Lipi Saha	1848645
EPA 365.1 Rev. 2.0 dissolved	11/09/2016			11/09/2016 14:58	Julia Storbeck	1848646
SM 2120 B	11/09/2016			11/09/2016 15:42	Jared I. Manley	1848644
SM 2320 B-97	11/09/2016			11/15/2016	Dale L. Simmons	1848644
SM 2540 C-97	11/09/2016			11/11/2016	Yijie Li	1848644
SM 2540 D-97	11/09/2016			11/11/2016	Yijie Li	1848644
SM 4500 F-C-97	11/09/2016			11/15/2016	Dale L. Simmons	1848644
SM 5310 B-00	11/09/2016			11/10/2016	Julie Michelle Frank	1848645