

Chemical Analysis Report

SO-DIST-2018-10-17-01

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

Event Description: **Telegraph**
Request ID: **RQ-2018-09-24-04**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Maryann Dugan

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 06-NOV-2018 11:52

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored 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: Telegraph Swamp South

Collection Date/Time: 10/16/2018 11:25

Field ID: G3SD0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2033345	EPA 180.1 Rev. 2.0	Turbidity	6.2	A	NTU	P353251	
	EPA 300.0 Rev. 2.1	Chloride	76		mg Cl/L	P353565	
		Sulfate	14		mg SO4/L	P353568	
	SM 2120 B	Color (true)	190		PCU	P353238	
	SM 2320 B-97	Total Alkalinity	82		mg CaCO3/L	P353553	
	SM 2540 C-97	TDS	301		mg/L	P353836	
	SM 2540 D-97	TSS	7	I	mg/L	P353585	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P353558	
2033346	EPA 350.1 Rev. 2.0	Ammonia-N	0.19		mg N/L	P353805	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P353671	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.097		mg N/L	P353350	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P353311	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P353537	
2033347	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.055		mg P/L	P353244	
2033351	EPA 200.7 Rev. 4.4	Calcium	38.4		mg/L	P353323	
		Iron	1.38E+03		ug/L	P353323	
		Magnesium	6.89		mg/L	P353323	
		Potassium	2.3		mg/L	P353323	
		Sodium	36.6		mg/L	P353323	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P353323	
		Arsenic	0.75		ug/L	P353392	
		Cadmium	0.020	U	ug/L	P353323	
		Chromium	0.78	I	ug/L	P353392	
		Copper	0.36	I	ug/L	P353323	
		Lead	0.16	I	ug/L	P353392	
		Nickel	0.32	I	ug/L	P353392	
		Silver	0.010	U	ug/L	P353323	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P353251

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353323

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
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: P353323

Component	Result	Code	Units
Cadmium	0.020	U	ug/L
Copper	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353392

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Chromium	0.40	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353565

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353568

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353805

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353671

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353671

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353350

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P353311

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353244

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

Reference Method: SM 2120 B
Batch ID: P353238

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P353553

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

Reference Method: SM 2540 C-97
Batch ID: P353836

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P353585

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P353558

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P353537

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: P353323

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	93.6		P	85 - 115
Magnesium	91.6		P	85 - 115
Potassium	93.5		P	85 - 115
Sodium	97.6		P	85 - 115
Zinc	90.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353323

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	104		P	85 - 115
Copper	105		P	85 - 115
Silver	94.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353392

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.2		P	85 - 115
Chromium	98.5		P	85 - 115
Lead	95.5		P	85 - 115
Nickel	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353565

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353568

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353805

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: P353671

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353350

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353350

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P353311

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353244

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

Reference Method: SM 2120 B
Batch ID: P353238

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

Reference Method: SM 2320 B-97
Batch ID: P353553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P353558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P353537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	91.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033418	Calcium	97.9		P	80 - 120
2033418	Iron	93.5	93.1	P/P	80 - 120
2033418	Magnesium	87.4		P	80 - 120
2033418	Potassium	91.9		P	80 - 120
2033418	Sodium	89.0		P	80 - 120
2033418	Zinc	90.0	89.9	P/P	80 - 120
2033544	Calcium	106		P	80 - 120
2033544	Iron	91.6		P	80 - 120
2033544	Magnesium	90.5		P	80 - 120
2033544	Potassium	89.2		P	80 - 120
2033544	Sodium	95.2		P	80 - 120
2033544	Zinc	88.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033418	Cadmium	108	109	P/P	80 - 120
2033418	Copper	101	101	P/P	80 - 120
2033418	Silver	94.8	96.4	P/P	80 - 120
2033544	Cadmium	115		P	80 - 120
2033544	Copper	106		P	80 - 120
2033544	Silver	99.1		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353392

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036696	Arsenic	98.7		P	80 - 120
2036696	Chromium	98.8		P	80 - 120
2036696	Lead	95.3		P	80 - 120
2036696	Nickel	96.2		P	80 - 120
2036996	Arsenic	97.5	98.0	P/P	80 - 120
2036996	Chromium	99.0	97.5	P/P	80 - 120
2036996	Lead	94.5	95.2	P/P	80 - 120
2036996	Nickel	96.5	96.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353565

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033099	Chloride	97.4		P	90 - 110
2033184	Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033099	Sulfate	101		P	90 - 110
2033184	Sulfate	98.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033357	Ammonia-N	98.1	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353671

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033358	Kjeldahl Nitrogen	96.9	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033295	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P353311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033295	Total-P	102	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353244

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033125	O-Phosphate-P	99.9	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P353558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033092	Fluoride	97.7	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P353537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2033108	Organic Carbon	92.6	95.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P353251

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033345	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033418	Calcium	2.25	Spike	P	0 - 20
2033418	Iron	0.426	Spike	P	0 - 20
2033418	Magnesium	0.561	Spike	P	0 - 20
2033418	Potassium	0.605	Spike	P	0 - 20
2033418	Sodium	0.208	Spike	P	0 - 20
2033418	Zinc	0.0408	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033418	Cadmium	1.25	Spike	P	0 - 20
2033418	Copper	0.0637	Spike	P	0 - 20
2033418	Silver	1.68	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353392

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036996	Arsenic	0.466	Spike	P	0 - 20
2036996	Chromium	1.26	Spike	P	0 - 20
2036996	Lead	0.707	Spike	P	0 - 20
2036996	Nickel	0.287	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033099	Chloride	0.851	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033099	Sulfate	0.758	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033357	Ammonia-N	1.12	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353671

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033358	Kjeldahl Nitrogen	7.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033295	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P353311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033295	Total-P	4.46	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353244

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033125	O-Phosphate-P	0.432	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P353238

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033294	Color (true)	0.780	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P353553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033092	Total Alkalinity	0.517	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P353836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033294	TDS	5.71	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P353558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033092	Fluoride	0.978	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P353537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2033108	Organic Carbon	2.36	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: SM 2120 B
Run ID: A87100
Included Lab Sample IDs: 2033345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A87103
Included Lab Sample IDs: 2033347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A87106
Included Lab Sample IDs: 2033345

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87160
Included Lab Sample IDs: 2033346

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: A87192
Included Lab Sample IDs: 2033346

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A87212
Included Lab Sample IDs: 2033345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	101	P/P	90 - 110
Sulfate	98.7	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A87236
Included Lab Sample IDs: 2033346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.5	94.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A87241
Included Lab Sample IDs: 2033345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A87241

Included Lab Sample IDs: 2033345

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87312

Included Lab Sample IDs: 2033351

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	102	102	P/P	90 - 110
Silver	94.9	95.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87337

Included Lab Sample IDs: 2033351

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.1	94.4	P/P	90 - 110
Magnesium	94.4	94.1	P/P	90 - 110
Potassium	97.7	96.7	P/P	90 - 110
Sodium	101	99.3	P/P	90 - 110
Zinc	97.2	95.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87340

Included Lab Sample IDs: 2033346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87350

Included Lab Sample IDs: 2033351

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	102	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87357

Included Lab Sample IDs: 2033346

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87365

Included Lab Sample IDs: 2033351

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87505

Included Lab Sample IDs: 2033351

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.3	97.9	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Lead	98.5	98.8	P/P	90 - 110
Nickel	99.3	99.1	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Calcium	102	97.9	106			2.25
	Iron	93.6	93.5	93.1	91.6		0.426
	Magnesium	91.6	87.4	90.5			0.561
	Potassium	93.5	91.9	89.2			0.605
	Sodium	97.6	89.0	95.2			0.208
	Zinc	90.2	90.0	89.9	88.3		0.0408
EPA 200.8 Rev. 5.4	Arsenic	97.2	98.7	97.5	98.0		0.466
	Cadmium	104	108	109	115		1.25
	Chromium	98.5	98.8	99.0	97.5		1.26
	Copper	105	101	101	106		0.0637
	Lead	95.5	95.3	94.5	95.2		0.707
	Nickel	97.8	96.2	96.5	96.8		0.287
	Silver	94.3	94.8	96.4	99.1		1.68
EPA 300.0 Rev. 2.1	Chloride	103	97.4	98.7		0.851	
	Sulfate	102	101	98.3		0.758	
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.1	96.8			1.12
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.9	106			7.11
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	101	102			0.494
EPA 365.1 Rev. 2.0	Total-P	101	102	97.0			4.46
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	99.9	99.1			0.432
SM 2120 B	Color (true)	102				0.780	
SM 2320 B-97	Total Alkalinity	101				0.517	
SM 2540 C-97	TDS					5.71	
SM 4500 F-C-97	Fluoride	99.4	97.7	98.9			0.978
SM 5310 B-00	Organic Carbon	91.1	92.6	95.0			2.36

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2033345
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2033351
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2033351
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2033345
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2033345
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2033346
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2033346
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2033346
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2033346
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2033347
SM 2120 B / E31780	True Color measured at 450 nm	2033345
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2033345
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2033345
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2033345
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2033345

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2033346

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/17/2018			10/17/2018 16:15	Megan Treadwell	2033345
EPA 200.7 Rev. 4.4	10/17/2018	10/19/2018 11:53	Devin Thornton	10/26/2018 19:17	Betina Topolski	2033351
	10/17/2018	10/19/2018 11:53	Devin Thornton	10/29/2018 18:06	Betina Topolski	2033351
EPA 200.8 Rev. 5.4	10/17/2018	10/19/2018 11:53	Devin Thornton	10/25/2018 17:41	Allison Taylor	2033351
	10/17/2018	10/19/2018 11:53	Devin Thornton	10/26/2018 18:17	Allison Taylor	2033351
	10/17/2018	10/30/2018 17:30	Elliott D. Healy	11/02/2018 19:25	Robert K Palmer	2033351
EPA 300.0 Rev. 2.1	10/17/2018			10/24/2018 09:31	Lipi Saha	2033345
EPA 350.1 Rev. 2.0	10/17/2018			10/26/2018 15:56	Ping Hua	2033346
EPA 351.2 Rev. 2.0	10/17/2018	10/25/2018 10:00	Adrian Shelby	10/29/2018 11:09	Virginia P. Brown	2033346
EPA 353.2 Rev. 2.0	10/17/2018			10/19/2018 12:19	Lauren Bottorf	2033346
EPA 365.1 Rev. 2.0	10/17/2018	10/19/2018 12:10	Sima Feizi	10/22/2018 09:22	Beverly Y. Sanders	2033346
EPA 365.1 Rev. 2.0 dissolved	10/17/2018			10/17/2018 15:40	Anthony C. Onicha	2033347
SM 2120 B	10/17/2018			10/17/2018 16:27	Chelsea Hernandez	2033345
SM 2320 B-97	10/17/2018			10/20/2018 11:17	Dale L. Simmons	2033345
SM 2540 C-97	10/17/2018			10/19/2018 15:48	Yijie Li	2033345
SM 2540 D-97	10/17/2018			10/19/2018 15:48	Yijie Li	2033345
SM 4500 F-C-97	10/17/2018			10/20/2018 11:17	Dale L. Simmons	2033345
SM 5310 B-00	10/17/2018			10/23/2018 11:00	Megan Treadwell	2033346