Chemical Analysis Report

CEN-DIST-2017-10-10-01

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

Event Description: **Greenwood / Noname**
Request ID: **RQ-2017-10-09-31**
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
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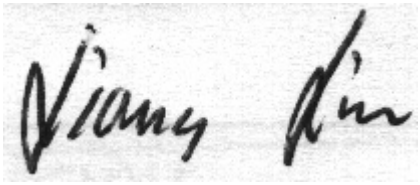
Certified by: Liang Lin, Environmental Administrator

Date Certified: 27-OCT-2017 11:34



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: LAKE HOPE @ CENTER **Collection Date/Time: 10/09/2017 12:50**

Field ID: G2CE0106 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1935150	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P333094	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P333239	
		Sulfate	18		mg SO4/L	P333242	
	SM 2120 B	Color (true)	35	A	PCU	P333103	
	SM 2320 B-97	Total Alkalinity	35		mg CaCO3/L	P333523	
	SM 2540 C-97	TDS	136	A	mg/L	P333823	
	SM 2540 D-97	TSS	2	UA	mg/L	P333281	
	SM 4500 F-C-97	Fluoride	0.065	I	mg F/L	P333526	
1935151	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P333393	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P333413	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P333337	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P333187	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P333654	
1935152	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333131	

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

Sample Location: GREENWOOD LAKE WEST LOBE @ CENTER **Collection Date/Time: 10/09/2017 11:20**

Field ID: G2CE0112 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1935153	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P333094	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P333239	
		Sulfate	2.5		mg SO4/L	P333242	
	SM 2120 B	Color (true)	59	A	PCU	P333100	
	SM 2320 B-97	Total Alkalinity	35		mg CaCO3/L	P333523	
	SM 2540 C-97	TDS	72		mg/L	P333824	
	SM 2540 D-97	TSS	4	I	mg/L	P333282	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P333526	
1935154	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P333393	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P333414	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P333337	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P333187	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P333654	
1935155	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333131	
1935163	EPA 200.7 Rev. 4.4	Calcium	13.1		mg/L	P333197	
		Iron	110	I	ug/L	P333197	
		Magnesium	1.87		mg/L	P333197	
		Potassium	2.3		mg/L	P333197	
		Sodium	9.9		mg/L	P333197	
		Zinc	5.0	U	ug/L	P333197	
	EPA 200.8 Rev. 5.4	Arsenic	0.73		ug/L	P333197	
		Cadmium	0.020	U	ug/L	P333197	
		Chromium	0.40	U	ug/L	P333197	

Field ID: G2CE0112 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1935163	EPA 200.8 Rev. 5.4	Copper	0.78	I	ug/L	P333197	
		Lead	0.050	U	ug/L	P333197	
		Nickel	0.20	U	ug/L	P333197	
		Silver	0.010	U	ug/L	P333197	

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: P333094

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P333197

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: P333197

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333239

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333242

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333393

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333393

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333413

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333414

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P333337

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333187

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333131

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

Reference Method: SM 2120 B
Batch ID: P333100

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P333103

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P333523

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: P333823

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P333824

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P333281

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P333282

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P333526

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P333654

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: P333197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	110		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	106		P	85 - 115
Sodium	111		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.4		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	99.1		P	85 - 115
Chromium	95.4		P	85 - 115
Copper	94.5		P	85 - 115
Lead	93.7		P	85 - 115
Nickel	97.0		P	85 - 115
Silver	94.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333239

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333242

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333393

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: P333413

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333414

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P333337

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: P333187

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333131

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

Reference Method: SM 2320 B-97
Batch ID: P333523

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

Reference Method: SM 4500 F-C-97
Batch ID: P333526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P333654

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P333197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935244	Calcium	107		P	80 - 120
1935244	Iron	109		P	80 - 120
1935244	Magnesium	111		P	80 - 120
1935244	Potassium	102		P	80 - 120
1935244	Sodium	107		P	80 - 120
1935244	Zinc	105		P	80 - 120
1935292	Calcium	103		P	80 - 120
1935292	Iron	113	112	P/P	80 - 120
1935292	Magnesium	113	112	P/P	80 - 120
1935292	Potassium	112	112	P/P	80 - 120
1935292	Sodium	113	113	P/P	80 - 120
1935292	Zinc	105	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935244	Arsenic	98.0		P	80 - 120
1935244	Cadmium	103		P	80 - 120
1935244	Chromium	95.4		P	80 - 120
1935244	Copper	95.2		P	80 - 120
1935244	Lead	94.0		P	80 - 120
1935244	Nickel	96.7		P	80 - 120
1935244	Silver	95.0		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935292	Arsenic	96.9	96.9	P/P	80 - 120
1935292	Cadmium	102	99.6	P/P	80 - 120
1935292	Chromium	96.0	95.2	P/P	80 - 120
1935292	Copper	90.6	91.0	P/P	80 - 120
1935292	Lead	94.0	92.8	P/P	80 - 120
1935292	Nickel	93.6	94.3	P/P	80 - 120
1935292	Silver	95.7	94.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333239

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935026	Chloride	101		P	90 - 110
1935059	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333242

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935026	Sulfate	95.9		P	90 - 110
1935059	Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333393

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935142	Ammonia-N	100	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333413

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935151	Kjeldahl Nitrogen	96.9	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935180	Kjeldahl Nitrogen	106	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P333337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935127	NO2NO3-N	97.6	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935151	Total-P	98.8	99.3	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935152	O-Phosphate-P	95.5	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P333526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935177	Fluoride	101	102	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P333654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1935154	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P333094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1934872	Turbidity	2.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P333197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935292	Calcium	0.380	Spike	P	0 - 20
1935292	Iron	0.843	Spike	P	0 - 20
1935292	Magnesium	1.10	Spike	P	0 - 20
1935292	Potassium	0.0289	Spike	P	0 - 20
1935292	Sodium	0.230	Spike	P	0 - 20
1935292	Zinc	0.291	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935292	Arsenic	0.0713	Spike	P	0 - 20
1935292	Cadmium	2.24	Spike	P	0 - 20
1935292	Chromium	0.760	Spike	P	0 - 20
1935292	Copper	0.374	Spike	P	0 - 20
1935292	Lead	1.28	Spike	P	0 - 20
1935292	Nickel	0.723	Spike	P	0 - 20
1935292	Silver	1.64	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333239

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935026	Chloride	1.25	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333242

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935026	Sulfate	1.07	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935142	Ammonia-N	1.91	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935151	Kjeldahl Nitrogen	4.54	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935180	Kjeldahl Nitrogen	4.74	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P333337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935127	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935151	Total-P	0.436	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935152	O-Phosphate-P	1.15	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P333100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935153	Color (true)	2.67	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P333103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935150	Color (true)	2.80	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P333523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935177	Total Alkalinity	0.0131	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P333823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935150	TDS	3.66	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P333824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935178	TDS	1.31	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P333526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935177	Fluoride	0.473	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P333654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1935154	Organic Carbon	0.820	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A79470
Included Lab Sample IDs: 1935150, 1935153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A79471
Included Lab Sample IDs: 1935150, 1935153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115
Color (true)	97.5	103	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A79473
Included Lab Sample IDs: 1935150, 1935153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	104	P/P	90 - 110
Sulfate	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A79477
Included Lab Sample IDs: 1935152, 1935155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.6	P/P	90 - 110
O-Phosphate-P	97.2	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A79513
Included Lab Sample IDs: 1935151, 1935154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A79524
Included Lab Sample IDs: 1935163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	102	P/P	90 - 110
Iron	104	102	P/P	90 - 110
Magnesium	105	103	P/P	90 - 110
Potassium	103	102	P/P	90 - 110
Sodium	104	103	P/P	90 - 110
Zinc	100	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A79536
Included Lab Sample IDs: 1935151, 1935154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A79555
Included Lab Sample IDs: 1935151, 1935154

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A79601
Included Lab Sample IDs: 1935154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A79605
Included Lab Sample IDs: 1935151

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A79618
Included Lab Sample IDs: 1935163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	100	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	99.4	99.6	P/P	90 - 110
Copper	102	100	P/P	90 - 110
Lead	96.3	96.6	P/P	90 - 110
Nickel	101	99.4	P/P	90 - 110
Silver	94.8	94.9	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A79620
Included Lab Sample IDs: 1935150, 1935153

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

Reference Method: SM 4500 F-C-97
Run ID: A79620
Included Lab Sample IDs: 1935150, 1935153

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

Reference Method: SM 5310 B-00
Run ID: A79655
Included Lab Sample IDs: 1935151, 1935154

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

Quality Assurance Report
Calibration Verification

* 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						2.43	
EPA 200.7 Rev. 4.4	Calcium	107	107	103				0.380
	Iron	110	109	113	112			0.843
	Magnesium	113	111	113	112			1.10
	Potassium	106	102	112	112			0.0289
	Sodium	111	107	113	113			0.230
	Zinc	105	105	105	104			0.291
EPA 200.8 Rev. 5.4	Arsenic	97.4	98.0	96.9	96.9			0.0713
	Cadmium	99.1	103	102	99.6			2.24
	Chromium	95.4	95.4	96.0	95.2			0.760
	Copper	94.5	95.2	90.6	91.0			0.374
	Lead	93.7	94.0	94.0	92.8			1.28
	Nickel	97.0	96.7	93.6	94.3			0.723
	Silver	94.4	95.0	95.7	94.2			1.64
EPA 300.0 Rev. 2.1	Chloride	100	101	100			1.25	
	Sulfate	96.7	95.9	96.8			1.07	
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	97.1				1.91
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	96.9	104				4.54
	Kjeldahl Nitrogen	106	106	100				4.74
EPA 353.2 Rev. 2.0	NO2NO3-N	104	97.6	97.6				0.0
EPA 365.1 Rev. 2.0	Total-P	100	98.8	99.3				0.436
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	95.5	96.6				1.15
SM 2120 B	Color (true)						2.67	
	Color (true)						2.80	
SM 2320 B-97	Total Alkalinity	102					0.0131	
SM 2540 C-97	TDS						3.66	
	TDS						1.31	
SM 4500 F-C-97	Fluoride	99.0	101	102				0.473
SM 5310 B-00	Organic Carbon	100	102	101				0.820

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1935150, 1935153
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1935163
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1935163
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1935150, 1935153
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1935150, 1935153
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1935151, 1935154
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1935151, 1935154

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1935151, 1935154
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1935151, 1935154
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1935152, 1935155
SM 2120 B / E31780	True Color measured at 450 nm	1935150, 1935153
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1935150, 1935153
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1935150, 1935153
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1935150, 1935153
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1935150, 1935153
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1935151, 1935154

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	10/10/2017			10/10/2017 16:21	DeAsia Armster	1935150, 1935153
EPA 200.7 Rev. 4.4	10/10/2017	10/11/2017	Elliott D. Healy	10/13/2017	Betina Topolski	1935163
EPA 200.8 Rev. 5.4	10/10/2017	10/11/2017	Elliott D. Healy	10/17/2017	Robert K Palmer	1935163
EPA 300.0 Rev. 2.1	10/10/2017			10/10/2017	Julia Storbeck	1935150, 1935153
EPA 350.1 Rev. 2.0	10/10/2017			10/13/2017	Sofia Elnemr	1935151, 1935154
EPA 351.2 Rev. 2.0	10/10/2017	10/16/2017	Adrian Shelby	10/17/2017	Virginia P. Brown	1935151, 1935154
EPA 353.2 Rev. 2.0	10/10/2017			10/13/2017	Beverly Y. Sanders	1935151, 1935154
EPA 365.1 Rev. 2.0	10/10/2017	10/11/2017	Sima Feizi	10/12/2017	Lipi Saha	1935151, 1935154
EPA 365.1 Rev. 2.0 dissolved	10/10/2017			10/10/2017 15:09	Megan Treadwell	1935152
	10/10/2017			10/10/2017 15:58	Megan Treadwell	1935155
SM 2120 B	10/10/2017			10/10/2017 15:56	Julia Storbeck	1935153
	10/10/2017			10/10/2017 16:28	Julia Storbeck	1935150
SM 2320 B-97	10/10/2017			10/17/2017	Dale L. Simmons	1935150, 1935153
SM 2540 C-97	10/10/2017			10/11/2017	Yijie Li	1935150, 1935153
SM 2540 D-97	10/10/2017			10/11/2017	Yijie Li	1935150, 1935153
SM 4500 F-C-97	10/10/2017			10/17/2017	Dale L. Simmons	1935150, 1935153
SM 5310 B-00	10/10/2017			10/19/2017	Ping Hua	1935151, 1935154