Chemical Analysis Report

CEN-DIST-2018-07-10-01

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

Event Description: **Lk Nan + LVI + D&B**
Request ID: **RQ-2018-07-09-45**
Customer: **CEN-DIST**
Project ID: **SMP**

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3319 Maguire Blvd., Suite 232
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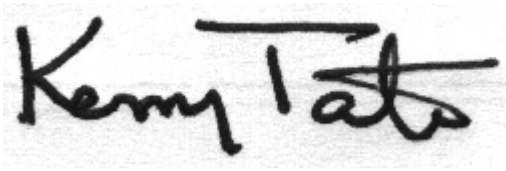
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 01-AUG-2018 12:05



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 NAN @ CENTER **Collection Date/Time: 07/09/2018 10:00**

Field ID: G2CE0091 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2005818	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P348180	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P348795	
		Sulfate	8.9		mg SO4/L	P348800	
	SM 2120 B	Color (true)	12		PCU	P348165	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P348404	
	SM 2540 C-97	TDS	78		mg/L	P348553	
	SM 2540 D-97	TSS	2	I	mg/L	P348559	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P348408	
2005819	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P348698	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P348379	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P348256	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P348301	
	SM 5310 B-00	Organic Carbon	6.6		mg C/L	P348456	
2005820	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P348224	
2005830	EPA 200.7 Rev. 4.4	Calcium	13.6		mg/L	P348273	
		Iron	30	U	ug/L	P348273	
		Magnesium	1.69		mg/L	P348273	
		Potassium	1.9		mg/L	P348273	
		Sodium	9.8		mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	1.81		ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.40	U	ug/L	P348273	
		Copper	1.35		ug/L	P348273	
		Lead	0.059	I	ug/L	P348273	
		Nickel	0.20	U	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

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: LAKE NAN @ CENTER **Collection Date/Time: 07/09/2018 10:05**

Field ID: G2CE0091_DUP Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2005821	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P348180	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P348795	
		Sulfate	9.5		mg SO4/L	P348800	
	SM 2120 B	Color (true)	12		PCU	P348165	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P348404	
	SM 2540 C-97	TDS	81		mg/L	P348553	
	SM 2540 D-97	TSS	3	I	mg/L	P348559	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P348408	
2005822	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P348698	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P348379	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P348256	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P348302	
	SM 5310 B-00	Organic Carbon	6.6		mg C/L	P348456	
2005823	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P348224	
2005831	EPA 200.7 Rev. 4.4	Calcium	13.6		mg/L	P348273	
		Iron	30	U	ug/L	P348273	
		Magnesium	1.71		mg/L	P348273	
		Potassium	2.0		mg/L	P348273	
		Sodium	9.9		mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	1.76		ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.40	U	ug/L	P348273	
		Copper	1.36		ug/L	P348273	
		Lead	0.059	I	ug/L	P348273	
		Nickel	0.20	U	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

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: FIELD BLANK/DI SOURCE WASHROOM **Collection Date/Time: 07/09/2018 10:18**

Field ID: BLANK_07092018 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2005824	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P348180	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P348795	
		Sulfate	0.20	U	mg SO4/L	P348800	
	SM 2120 B	Color (true)	2.5	U	PCU	P348165	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P348404	
	SM 2540 C-97	TDS	15	U	mg/L	P348551	
	SM 2540 D-97	TSS	2	U	mg/L	P348557	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P348408	
2005825	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P348698	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P348379	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P348256	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P348302	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P348456	
2005826	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P348224	
2005832	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P348273	
		Iron	30	U	ug/L	P348273	
		Magnesium	0.040	U	mg/L	P348273	
		Potassium	0.30	U	mg/L	P348273	
		Sodium	0.50	U	mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.40	U	ug/L	P348273	
		Copper	0.88		ug/L	P348273	
		Lead	0.050	U	ug/L	P348273	
		Nickel	0.20	U	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 07/12/2018.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P348180

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

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: P348273

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: P348795

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348698

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348379

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348256

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348301

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348302

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348224

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

Reference Method: SM 2120 B
Batch ID: P348165

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P348404

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

Reference Method: SM 2540 C-97
Batch ID: P348551

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P348553

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P348557

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P348559

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P348408

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P348456

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: P348273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	99.1		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	99.7		P	85 - 115
Chromium	98.1		P	85 - 115
Copper	100		P	85 - 115
Lead	97.0		P	85 - 115
Nickel	102		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348698

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: P348379

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348256

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348302

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348224

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	91.9		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P348165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P348404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P348408

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P348456

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005587	Calcium	101		P	80 - 120
2005587	Iron	105		P	80 - 120
2005587	Magnesium	103		P	80 - 120
2005587	Potassium	102		P	80 - 120
2005587	Sodium	98.0		P	80 - 120
2005587	Zinc	102		P	80 - 120
2005831	Calcium	108		P	80 - 120
2005831	Iron	108	107	P/P	80 - 120
2005831	Magnesium	108	106	P/P	80 - 120
2005831	Potassium	103	101	P/P	80 - 120
2005831	Sodium	99.0		P	80 - 120
2005831	Zinc	105	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005587	Arsenic	102		P	80 - 120
2005587	Cadmium	103		P	80 - 120
2005587	Chromium	98.2		P	80 - 120
2005587	Copper	98.0		P	80 - 120
2005587	Lead	98.3		P	80 - 120
2005587	Nickel	99.3		P	80 - 120
2005587	Silver	104		P	80 - 120
2005831	Arsenic	101	96.5	P/P	80 - 120
2005831	Cadmium	103	96.4	P/P	80 - 120
2005831	Chromium	99.0	94.3	P/P	80 - 120
2005831	Copper	98.4	93.6	P/P	80 - 120
2005831	Lead	98.6	93.6	P/P	80 - 120
2005831	Nickel	100	95.6	P/P	80 - 120
2005831	Silver	103	98.1	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005263	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005263	Sulfate	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005712	Ammonia-N	100	97.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005819	Kjeldahl Nitrogen	90.9	93.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348256

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005715	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005713	Total-P	93.9	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005822	Total-P	92.0	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348224

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005464	O-Phosphate-P	93.6	94.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P348408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005922	Fluoride	97.5	96.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P348456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005458	Organic Carbon	95.2	99.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P348180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005729	Turbidity	3.39	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005831	Calcium	1.99	Spike	P	0 - 20
2005831	Iron	0.455	Spike	P	0 - 20
2005831	Magnesium	1.14	Spike	P	0 - 20
2005831	Potassium	1.17	Spike	P	0 - 20
2005831	Sodium	1.94	Spike	P	0 - 20
2005831	Zinc	1.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005831	Arsenic	4.57	Spike	P	0 - 20
2005831	Cadmium	6.12	Spike	P	0 - 20
2005831	Chromium	4.85	Spike	P	0 - 20
2005831	Copper	4.64	Spike	P	0 - 20
2005831	Lead	5.15	Spike	P	0 - 20
2005831	Nickel	4.45	Spike	P	0 - 20
2005831	Silver	5.05	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005263	Chloride	6.45	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005263	Sulfate	7.16	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005712	Ammonia-N	2.24	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005819	Kjeldahl Nitrogen	1.69	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005715	NO2NO3-N	0.297	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005713	Total-P	1.55	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005822	Total-P	4.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348224

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005464	O-Phosphate-P	0.801	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P348165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005816	Color (true)	8.21	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P348404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005922	Total Alkalinity	1.01	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P348551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005283	TDS	3.75	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P348553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005409	TDS	3.00	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P348408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005922	Fluoride	0.998	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P348456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005458	Organic Carbon	3.56	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: A85117
Included Lab Sample IDs: 2005818, 2005821, 2005824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	98.4	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A85120
Included Lab Sample IDs: 2005818, 2005821, 2005824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A85135
Included Lab Sample IDs: 2005820, 2005823, 2005826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	93.9	91.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A85150
Included Lab Sample IDs: 2005819, 2005822, 2005825

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85190
Included Lab Sample IDs: 2005830, 2005831, 2005832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	102	P/P	90 - 110
Calcium	107	104	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Potassium	103	102	P/P	90 - 110
Sodium	102	99.3	P/P	90 - 110
Sodium	98.2	96.6	P/P	90 - 110
Zinc	101	103	P/P	90 - 110
Zinc	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85206
Included Lab Sample IDs: 2005819, 2005822, 2005825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A85217
Included Lab Sample IDs: 2005818, 2005821, 2005824

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

Reference Method: SM 4500 F-C-97
Run ID: A85217
Included Lab Sample IDs: 2005818, 2005821, 2005824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85227
Included Lab Sample IDs: 2005830, 2005831, 2005832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	100	P/P	90 - 110
Arsenic	99.0	98.5	P/P	90 - 110
Cadmium	97.9	97.9	P/P	90 - 110
Cadmium	99.1	99.7	P/P	90 - 110
Chromium	98.5	99.2	P/P	90 - 110
Chromium	99.2	100	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Copper	99.8	100	P/P	90 - 110
Lead	97.9	98.0	P/P	90 - 110
Lead	98.3	98.7	P/P	90 - 110
Nickel	101	99.8	P/P	90 - 110
Nickel	99.0	100	P/P	90 - 110
Silver	99.3	101	P/P	90 - 110
Silver	99.4	99.3	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A85235
Included Lab Sample IDs: 2005819, 2005822, 2005825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.0	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85285
Included Lab Sample IDs: 2005819, 2005822, 2005825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.6	94.9	P/P	90 - 110
Kjeldahl Nitrogen	95.8	93.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85318
Included Lab Sample IDs: 2005819, 2005822, 2005825

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A85337
Included Lab Sample IDs: 2005818, 2005821, 2005824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	99.3	P/P	90 - 110
Sulfate	101	99.9	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						3.39	
EPA 200.7 Rev. 4.4	Calcium	104	101	108				1.99
	Iron	103	105	108	107			0.455
	Magnesium	104	103	108	106			1.14
	Potassium	102	102	103	101			1.17
	Sodium	99.1	98.0	99.0				1.94
	Zinc	103	102	105	106			1.16
EPA 200.8 Rev. 5.4	Arsenic	102	102	101	96.5			4.57
	Cadmium	99.7	103	103	96.4			6.12
	Chromium	98.1	98.2	99.0	94.3			4.85
	Copper	100	98.0	98.4	93.6			4.64
	Lead	97.0	98.3	98.6	93.6			5.15
	Nickel	102	99.3	100	95.6			4.45
	Silver	103	104	103	98.1			5.05
EPA 300.0 Rev. 2.1	Chloride	104	108				6.45	
	Sulfate	102	105				7.16	
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	97.6				2.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.9	90.9	93.4				1.69
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	102				0.297
EPA 365.1 Rev. 2.0	Total-P	96.5	93.9	95.6				1.55
	Total-P	93.8	92.0	96.4				4.48
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	91.9	93.6	94.6				0.801
SM 2120 B	Color (true)	99.1					8.21	
SM 2320 B-97	Total Alkalinity	103					1.01	
SM 2540 C-97	TDS						3.75	
	TDS						3.00	
SM 4500 F-C-97	Fluoride	98.0	97.5	96.3				0.998
SM 5310 B-00	Organic Carbon	97.6	95.2	99.0				3.56

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2005818, 2005821, 2005824
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2005830, 2005831, 2005832
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2005830, 2005831, 2005832
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2005818, 2005821, 2005824
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2005818, 2005821, 2005824
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2005819, 2005822, 2005825
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2005819, 2005822, 2005825
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2005819, 2005822, 2005825
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2005819, 2005822, 2005825
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2005820, 2005823, 2005826
SM 2120 B / E31780	True Color measured at 450 nm	2005818, 2005821, 2005824
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2005818, 2005821, 2005824
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2005818, 2005821, 2005824

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2005818, 2005821, 2005824
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2005818, 2005821, 2005824
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2005819, 2005822, 2005825

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	07/10/2018			07/10/2018 17:42	William L. Brown IV	2005818, 2005821, 2005824
EPA 200.7 Rev. 4.4	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 13:29	Betina Topolski	2005832
	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 16:23	Betina Topolski	2005830
	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 16:30	Betina Topolski	2005831
EPA 200.8 Rev. 5.4	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 14:13	Robert K Palmer	2005832
	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 17:29	Robert K Palmer	2005830
	07/10/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 17:39	Robert K Palmer	2005831
EPA 300.0 Rev. 2.1	07/10/2018			07/19/2018 18:02	Lipi Saha	2005818
	07/10/2018			07/19/2018 18:14	Lipi Saha	2005821
	07/10/2018			07/19/2018 18:26	Lipi Saha	2005824
EPA 350.1 Rev. 2.0	07/10/2018			07/17/2018 15:04	Ping Hua	2005819
	07/10/2018			07/17/2018 15:06	Ping Hua	2005822
	07/10/2018			07/17/2018 15:07	Ping Hua	2005825
EPA 351.2 Rev. 2.0	07/10/2018	07/13/2018 09:00	Adrian Shelby	07/18/2018 00:12	Joseph Suarez	2005819
	07/10/2018	07/13/2018 09:00	Adrian Shelby	07/18/2018 00:19	Joseph Suarez	2005822
	07/10/2018	07/13/2018 09:00	Adrian Shelby	07/18/2018 00:21	Joseph Suarez	2005825
EPA 353.2 Rev. 2.0	07/10/2018			07/11/2018 13:28	Lauren Bottorf	2005825
	07/10/2018			07/11/2018 13:29	Lauren Bottorf	2005819
	07/10/2018			07/11/2018 13:31	Lauren Bottorf	2005822
EPA 365.1 Rev. 2.0	07/10/2018	07/12/2018 11:10	Sima Feizi	07/13/2018 11:10	Beverly Y. Sanders	2005819
	07/10/2018	07/12/2018 11:10	Sima Feizi	07/13/2018 11:12	Beverly Y. Sanders	2005822
	07/10/2018	07/12/2018 11:10	Sima Feizi	07/13/2018 11:13	Beverly Y. Sanders	2005825
EPA 365.1 Rev. 2.0 dissolved	07/10/2018			07/10/2018 14:41	Anthony C. Onicha	2005820
	07/10/2018			07/10/2018 14:42	Anthony C. Onicha	2005823
	07/10/2018			07/10/2018 14:44	Anthony C. Onicha	2005826
SM 2120 B	07/10/2018			07/10/2018 16:24	Tanya Welborn	2005818
	07/10/2018			07/10/2018 16:25	Tanya Welborn	2005821
	07/10/2018			07/10/2018 16:26	Tanya Welborn	2005824
SM 2320 B-97	07/10/2018			07/13/2018 06:09	Dale L. Simmons	2005818
	07/10/2018			07/13/2018 06:19	Dale L. Simmons	2005821
	07/10/2018			07/13/2018 06:32	Dale L. Simmons	2005824
SM 2540 C-97	07/10/2018			07/11/2018 14:46	Yijie Li	2005818, 2005821, 2005824
SM 2540 D-97	07/10/2018			07/11/2018 14:46	Yijie Li	2005818, 2005821, 2005824
SM 4500 F-C-97	07/10/2018			07/13/2018 06:09	Dale L. Simmons	2005818
	07/10/2018			07/13/2018 06:19	Dale L. Simmons	2005821
	07/10/2018			07/13/2018 06:32	Dale L. Simmons	2005824
SM 5310 B-00	07/10/2018			07/13/2018 17:50	Megan Treadwell	2005819
	07/10/2018			07/13/2018 18:05	Megan Treadwell	2005822
	07/10/2018			07/13/2018 18:19	Megan Treadwell	2005825