

Chemical Analysis Report

CEN-DIST-2017-04-11-03

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

Event Description: **Lake Beauclair**
Request ID: **RQ-2017-04-03-62**
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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-MAY-2017 10:59

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored 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: Lake Beauclair @ 1 KM West of Center

Collection Date/Time: 04/10/2017 12:05

Field ID: G1CE0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887317	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P323150	
	EPA 300.0 Rev. 2.1	Chloride	45		mg Cl/L	P323489	
		Sulfate	39		mg SO4/L	P323484	
		Color (true)	17		PCU	P323116	
	SM 2320 B-97	Total Alkalinity	104		mg CaCO3/L	P323882	
	SM 2540 C-97	TDS	269		mg/L	P323653	
	SM 2540 D-97	TSS	26		mg/L	P323884	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P323898	
1887321	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P323131	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.4		mg N/L	P323411	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323318	
	EPA 365.1 Rev. 2.0	Total-P	0.084		mg P/L	P323302	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P323329	
1887325	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323108	
1887342	EPA 200.7 Rev. 4.4	Calcium	37.5		mg/L	P323340	
		Iron	30	U	ug/L	P323340	
		Magnesium	16.1		mg/L	P323340	
		Potassium	13.5		mg/L	P323340	
		Sodium	22.4		mg/L	P323340	
		Zinc	5.0	U	ug/L	P323340	
	EPA 200.8 Rev. 5.4	Arsenic	2.72		ug/L	P323340	
		Cadmium	0.088		ug/L	P323340	
		Chromium	0.40	U	ug/L	P323340	
		Copper	0.47	I	ug/L	P323340	
		Lead	0.11	I	ug/L	P323340	
		Nickel	0.30	I	ug/L	P323340	
		Silver	0.010	U	ug/L	P323340	

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 Beauclair @ Center

Collection Date/Time: 04/10/2017 12:21

Field ID: G1CE0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887318	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P323150	
	EPA 300.0 Rev. 2.1	Chloride	45		mg Cl/L	P323489	
		Sulfate	39		mg SO4/L	P323484	
		Color (true)	17	A	PCU	P323116	
	SM 2320 B-97	Total Alkalinity	105		mg CaCO3/L	P323882	
	SM 2540 C-97	TDS	249		mg/L	P323653	
	SM 2540 D-97	TSS	27		mg/L	P323884	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P323898	
1887322	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P323131	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P323411	MS

Field ID: G1CE0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887322	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323319	
	EPA 365.1 Rev. 2.0	Total-P	0.080		mg P/L	P323302	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P323329	
1887326	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323108	
1887343	EPA 200.7 Rev. 4.4	Calcium	37.1		mg/L	P323340	
		Iron	30	U	ug/L	P323340	
		Magnesium	16.1		mg/L	P323340	
		Potassium	13.2		mg/L	P323340	
		Sodium	22.2		mg/L	P323340	
		Zinc	5.0	U	ug/L	P323340	
	EPA 200.8 Rev. 5.4	Arsenic	2.61		ug/L	P323340	
		Cadmium	0.020	U	ug/L	P323340	
		Chromium	0.40	U	ug/L	P323340	
		Copper	0.20	U	ug/L	P323340	
		Lead	0.092	I	ug/L	P323340	
		Nickel	0.20	U	ug/L	P323340	
		Silver	0.010	U	ug/L	P323340	

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 Beauclair @ North End of East Lobe

Collection Date/Time: 04/10/2017 12:35

Field ID: G1CE0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887319	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P323150	
	EPA 300.0 Rev. 2.1	Chloride	45		mg Cl/L	P323489	
		Sulfate	38		mg SO4/L	P323484	
	SM 2120 B	Color (true)	17		PCU	P323116	
	SM 2320 B-97	Total Alkalinity	107		mg CaCO3/L	P323882	
	SM 2540 C-97	TDS	255		mg/L	P323653	
	SM 2540 D-97	TSS	19		mg/L	P323884	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P323898	
1887323	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P323131	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.4		mg N/L	P323411	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323319	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P323302	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P323329	
1887327	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323108	
1887344	EPA 200.7 Rev. 4.4	Calcium	37.5		mg/L	P323340	
		Iron	30	U	ug/L	P323340	
		Magnesium	15.9		mg/L	P323340	
		Potassium	13.3		mg/L	P323340	
		Sodium	22.3		mg/L	P323340	
		Zinc	5.0	U	ug/L	P323340	
	EPA 200.8 Rev. 5.4	Arsenic	2.62		ug/L	P323340	

Field ID: G1CE0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887344	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P323340	
		Chromium	0.40	U	ug/L	P323340	
		Copper	0.20	U	ug/L	P323340	
		Lead	0.092	I	ug/L	P323340	
		Nickel	0.20	U	ug/L	P323340	
		Silver	0.010	U	ug/L	P323340	

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 Beauclair @ South End of East Lobe

Collection Date/Time: 04/10/2017 12:46

Field ID: G1CE0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1887320	EPA 180.1 Rev. 2.0	Turbidity	16		NTU	P323151	
	EPA 300.0 Rev. 2.1	Chloride	45		mg Cl/L	P323489	
		Sulfate	38		mg SO4/L	P323484	
	SM 2120 B	Color (true)	17		PCU	P323116	
	SM 2320 B-97	Total Alkalinity	106		mg CaCO3/L	P323882	
	SM 2540 C-97	TDS	265	A	mg/L	P323653	
	SM 2540 D-97	TSS	21		mg/L	P323884	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P323898	
1887324	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P323131	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P323411	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323319	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P323302	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P323329	
1887328	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P323108	
1887345	EPA 200.7 Rev. 4.4	Calcium	38.0		mg/L	P323340	
		Iron	30	U	ug/L	P323340	
		Magnesium	16.3		mg/L	P323340	
		Potassium	13.5		mg/L	P323340	
		Sodium	22.7		mg/L	P323340	
		Zinc	5.0	U	ug/L	P323340	
	EPA 200.8 Rev. 5.4	Arsenic	2.66		ug/L	P323340	
		Cadmium	0.020	U	ug/L	P323340	
		Chromium	0.40	U	ug/L	P323340	
		Copper	0.20	U	ug/L	P323340	
		Lead	0.097	I	ug/L	P323340	
		Nickel	0.20	U	ug/L	P323340	
		Silver	0.010	U	ug/L	P323340	

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323150

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323151

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323340

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: P323340

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: P323484

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323489

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323131

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3234113

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323318

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323319

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323302

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323108

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

Reference Method: SM 2120 B
Batch ID: P323116

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P323882

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P323653

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P323884

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
 Batch ID: P323898

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P323329

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: P323340

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	106		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P323340

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.8		P	85 - 115
Cadmium	98.0		P	85 - 115
Chromium	99.0		P	85 - 115
Copper	97.5		P	85 - 115
Lead	98.0		P	85 - 115
Nickel	98.8		P	85 - 115
Silver	97.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323484

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323489

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P323131

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P3234113

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: P323318

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P323319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P323302

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P323108

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2320 B-97
 Batch ID: P323882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P323898

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P323329

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P323340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P323340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887202	Calcium	108	106	P/P	80 - 120
1887202	Iron	108	106	P/P	80 - 120
1887202	Magnesium	112	110	P/P	80 - 120
1887202	Potassium	102	101	P/P	80 - 120
1887202	Sodium	104		P	80 - 120
1887202	Zinc	105	105	P/P	80 - 120
1887309	Calcium	105		P	80 - 120
1887309	Iron	105		P	80 - 120
1887309	Magnesium	109		P	80 - 120
1887309	Potassium	101		P	80 - 120
1887309	Sodium	103		P	80 - 120
1887309	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P323340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887202	Arsenic	97.9	97.3	P/P	80 - 120
1887202	Cadmium	99.0	97.3	P/P	80 - 120
1887202	Chromium	98.5	97.6	P/P	80 - 120
1887202	Copper	96.4	95.9	P/P	80 - 120
1887202	Lead	100	99.0	P/P	80 - 120
1887202	Nickel	96.1	95.2	P/P	80 - 120
1887202	Silver	96.4	97.2	P/P	80 - 120
1887309	Arsenic	96.4		P	80 - 120
1887309	Cadmium	96.9		P	80 - 120
1887309	Chromium	97.7		P	80 - 120
1887309	Copper	94.6		P	80 - 120
1887309	Lead	100		P	80 - 120
1887309	Nickel	94.1		P	80 - 120
1887309	Silver	96.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887181	Sulfate	101		P	90 - 110
1887286	Sulfate	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887181	Chloride	103		P	90 - 110
1887286	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P323131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887282	Ammonia-N	103	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3234113

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887283	Kjeldahl Nitrogen	85.2	88.0	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323318

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887260	NO2NO3-N	100	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887292	NO2NO3-N	99.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887323	Total-P	102	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323108

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887285	O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P323898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888757	Fluoride	101	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P323329

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887224	Organic Carbon	103	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887280	Turbidity	1.24	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887370	Turbidity	0.548	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887202	Calcium	1.19	Spike	P	0 - 20
1887202	Iron	1.50	Spike	P	0 - 20
1887202	Magnesium	1.23	Spike	P	0 - 20
1887202	Potassium	1.39	Spike	P	0 - 20
1887202	Sodium	0.280	Spike	P	0 - 20
1887202	Zinc	0.632	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887202	Arsenic	0.662	Spike	P	0 - 20
1887202	Cadmium	1.73	Spike	P	0 - 20
1887202	Chromium	0.846	Spike	P	0 - 20
1887202	Copper	0.565	Spike	P	0 - 20
1887202	Lead	1.27	Spike	P	0 - 20
1887202	Nickel	0.978	Spike	P	0 - 20
1887202	Silver	0.861	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887286	Sulfate	0.438	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887286	Chloride	0.286	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887282	Ammonia-N	0.944	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3234113

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887283	Kjeldahl Nitrogen	2.72	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323318

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887260	NO2NO3-N	1.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887292	NO2NO3-N	0.621	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887323	Total-P	4.36	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887285	O-Phosphate-P	0.504	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P323116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887318	Color (true)	1.38	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P323882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888757	Total Alkalinity	1.07	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P323653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887320	TDS	3.77	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P323898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888757	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P323329

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887224	Organic Carbon	0.537	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: A75721
Included Lab Sample IDs: 1887325, 1887326, 1887327, 1887328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	97.5	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A75722
Included Lab Sample IDs: 1887317, 1887318, 1887319, 1887320

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75725
Included Lab Sample IDs: 1887321, 1887322, 1887323, 1887324

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75732
Included Lab Sample IDs: 1887317, 1887318, 1887319, 1887320

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A75759
Included Lab Sample IDs: 1887321, 1887322, 1887323, 1887324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.0	94.5	P/P	90 - 110
NO2NO3-N	96.5	94.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A75769

Included Lab Sample IDs: 1887321, 1887322, 1887323, 1887324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75777

Included Lab Sample IDs: 1887321, 1887322, 1887323, 1887324

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75780

Included Lab Sample IDs: 1887317, 1887318, 1887319, 1887320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	99.2	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75891

Included Lab Sample IDs: 1887342, 1887343, 1887344, 1887345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.8	96.9	P/P	90 - 110
Cadmium	98.6	97.1	P/P	90 - 110
Chromium	99.6	97.9	P/P	90 - 110
Copper	97.7	96.6	P/P	90 - 110
Lead	96.8	96.1	P/P	90 - 110
Nickel	98.4	96.4	P/P	90 - 110
Silver	95.2	95.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75951

Included Lab Sample IDs: 1887342, 1887343, 1887344, 1887345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	101	P/P	90 - 110
Calcium	98.6	100	P/P	90 - 110
Iron	100	101	P/P	90 - 110
Iron	99.2	100	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	102	103	P/P	90 - 110
Potassium	103	104	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Sodium	103	103	P/P	90 - 110
Zinc	96.0	96.7	P/P	90 - 110
Zinc	96.5	96.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A75952

Included Lab Sample IDs: 1887317, 1887318, 1887319, 1887320

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

Reference Method: SM 4500 F-C-97

Run ID: A75952

Included Lab Sample IDs: 1887317, 1887318, 1887319, 1887320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76054

Included Lab Sample IDs: 1887321, 1887322, 1887323, 1887324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	102	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				1.24	
	Turbidity				0.548	
EPA 200.7 Rev. 4.4	Calcium	106	108 106 105			1.19
	Iron	106	108 106 105			1.50
	Magnesium	110	112 110 109			1.23
	Potassium	103	102 101 101			1.39
	Sodium	104	104 103			0.280
	Zinc	101	105 105 103			0.632
EPA 200.8 Rev. 5.4	Arsenic	98.8	97.9 97.3 96.4			0.662
	Cadmium	98.0	99.0 97.3 96.9			1.73
	Chromium	99.0	98.5 97.6 97.7			0.846
	Copper	97.5	96.4 95.9 94.6			0.565
	Lead	98.0	100 100 99.0			1.27
	Nickel	98.8	96.1 95.2 94.1			0.978
	Silver	97.2	96.4 97.2 96.5			0.861
EPA 300.0 Rev. 2.1	Chloride	104	102 103		0.286	
	Sulfate	100	99.7 101		0.438	
EPA 350.1 Rev. 2.0	Ammonia-N	104	103 104			0.944
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	85.2 88.0			2.72
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100 99.0			1.01
	NO2NO3-N	98.5	99.5 98.5			0.621
EPA 365.1 Rev. 2.0	Total-P	100	102 96.4			4.36
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	99.4 98.9			0.504
SM 2120 B	Color (true)				1.38	
SM 2320 B-97	Total Alkalinity	103			1.07	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
SM 2540 C-97	TDS				3.77	
SM 4500 F-C-97	Fluoride	97.1	101	101		0.0
SM 5310 B-00	Organic Carbon	101	103	102		0.537

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1887317, 1887318, 1887319, 1887320
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1887342, 1887343, 1887344, 1887345
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1887342, 1887343, 1887344, 1887345
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1887317, 1887318, 1887319, 1887320
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1887317, 1887318, 1887319, 1887320
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1887321, 1887322, 1887323, 1887324
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1887321, 1887322, 1887323, 1887324
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1887321, 1887322, 1887323, 1887324
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1887321, 1887322, 1887323, 1887324
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1887325, 1887326, 1887327, 1887328
SM 2120 B / E31780	True Color measured at 450 nm	1887317, 1887318, 1887319, 1887320
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1887317, 1887318, 1887319, 1887320
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1887317, 1887318, 1887319, 1887320
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1887317, 1887318, 1887319, 1887320
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1887317, 1887318, 1887319, 1887320
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1887321, 1887322, 1887323, 1887324

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	04/11/2017			04/11/2017 16:14	Blanca Fach	1887317, 1887318, 1887319, 1887320
EPA 200.7 Rev. 4.4	04/11/2017	04/13/2017	Elliott D. Healy	04/21/2017	Martin Acosta	1887342, 1887343, 1887344, 1887345
EPA 200.8 Rev. 5.4	04/11/2017	04/13/2017	Elliott D. Healy	04/19/2017	Betina Topolski	1887342, 1887343, 1887344, 1887345
EPA 300.0 Rev. 2.1	04/11/2017			04/15/2017	Ping Hua	1887317, 1887318, 1887319, 1887320
EPA 350.1 Rev. 2.0	04/11/2017			04/11/2017	Julie Michelle Frank	1887321, 1887322, 1887323, 1887324
EPA 351.2 Rev. 2.0	04/11/2017	04/27/2017	Adrian Shelby	04/28/2017	Joseph Suarez	1887321, 1887322, 1887323, 1887324
EPA 353.2 Rev. 2.0	04/11/2017			04/13/2017	Beverly Y. Sanders	1887321, 1887322, 1887323, 1887324
EPA 365.1 Rev. 2.0	04/11/2017	04/13/2017	Adrian Shelby	04/13/2017	Lipi Saha	1887321, 1887322, 1887323, 1887324
EPA 365.1 Rev. 2.0 dissolved	04/11/2017			04/11/2017 15:04	Lipi Saha	1887325
	04/11/2017			04/11/2017 15:05	Lipi Saha	1887326, 1887327
	04/11/2017			04/11/2017 15:06	Lipi Saha	1887328
SM 2120 B	04/11/2017			04/11/2017 16:44	Julia Storbeck	1887318
	04/11/2017			04/11/2017 16:47	Julia Storbeck	1887317
	04/11/2017			04/11/2017 16:48	Julia Storbeck	1887319
	04/11/2017			04/11/2017 16:49	Julia Storbeck	1887320
SM 2320 B-97	04/11/2017			04/22/2017	Dale L. Simmons	1887317, 1887318, 1887319, 1887320
SM 2540 C-97	04/11/2017			04/14/2017	Yijie Li	1887317, 1887318, 1887319, 1887320
SM 2540 D-97	04/11/2017			04/14/2017	Yijie Li	1887317, 1887318, 1887319, 1887320
SM 4500 F-C-97	04/11/2017			04/22/2017	Dale L. Simmons	1887317, 1887318, 1887319, 1887320
SM 5310 B-00	04/11/2017			04/12/2017	Julie Michelle Frank	1887321, 1887322, 1887323, 1887324