

Chemical Analysis Report

NE-DIST-2017-01-05-01

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

Event Description: **LSJR SW**
Request ID: **RQ-2017-01-02-54**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite B 200
Jacksonville, FL 32256
Attn: Jeremy Parrish

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Certified by: Colin Wright, Program Administrator

Date Certified: 02-FEB-2017 10:06

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: St. Johns River @ Alpine Grove dock

Collection Date/Time: 01/04/2017 12:12

Field ID: G2NE1129 01042017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1861466	EPA 180.1 Rev. 2.0	Turbidity	7.6		NTU	P317814	
	EPA 300.0 Rev. 2.1	Chloride	220		mg Cl/L	P318404	
		Sulfate	60		mg SO4/L	P318403	
	SM 2120 B	Color (true)	74		PCU	P317809	
	SM 2320 B-97	Total Alkalinity	70		mg CaCO3/L	P317915	
	SM 2540 C-97	TDS	550		mg/L	P318413	
	SM 2540 D-97	TSS	11		mg/L	P318205	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P317918	
1861468	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P317986	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P317827	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.044		mg N/L	P318241	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P317885	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P317927	
1861470	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P317797	
1861477	EPA 200.7 Rev. 4.4	Calcium	44.8		mg/L	P318041	
		Iron	310		ug/L	P318041	
		Magnesium	18.1		mg/L	P318041	
		Potassium	4.9		mg/L	P318041	
		Sodium	119		mg/L	P318041	
		Zinc	5.0	U	ug/L	P318041	
	EPA 200.8 Rev. 5.4	Arsenic	1.68		ug/L	P318041	
		Cadmium	0.020	U	ug/L	P318041	
		Chromium	0.66		ug/L	P318041	
		Copper	1.36		ug/L	P318041	
		Lead	0.50		ug/L	P318041	
		Nickel	0.34		ug/L	P318041	
		Silver	0.0050	U	ug/L	P318041	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: St. Johns River @ Alpine Grove dock dup

Collection Date/Time: 01/04/2017 12:20

Field ID: G2NE1129 01042017 dup

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1861467	EPA 180.1 Rev. 2.0	Turbidity	7.2		NTU	P317814	
	EPA 300.0 Rev. 2.1	Chloride	220		mg Cl/L	P318404	
		Sulfate	59		mg SO4/L	P318403	
	SM 2120 B	Color (true)	74		PCU	P317809	
	SM 2320 B-97	Total Alkalinity	70		mg CaCO3/L	P317915	
	SM 2540 C-97	TDS	546		mg/L	P318414	
	SM 2540 D-97	TSS	12		mg/L	P318206	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P317918	
1861469	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P317986	

Field ID: G2NE1129 01042017 dup

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1861469	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P317828	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P318241	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P317885	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P317927	
1861471	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.029		mg P/L	P317797	
1861478	EPA 200.7 Rev. 4.4	Calcium	45.5		mg/L	P318041	
		Iron	300		ug/L	P318041	
		Magnesium	18.4		mg/L	P318041	
		Potassium	4.9		mg/L	P318041	
		Sodium	122		mg/L	P318041	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P318041	
		Arsenic	1.72		ug/L	P318041	
		Cadmium	0.020	U	ug/L	P318041	
		Chromium	0.66		ug/L	P318041	
		Copper	1.36		ug/L	P318041	
		Lead	0.48		ug/L	P318041	
		Nickel	0.32		ug/L	P318041	
		Silver	0.0050	U	ug/L	P318041	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Un.Branch at Old Brit Rd

Collection Date/Time: 01/04/2017 11:00

Field ID: G2NE114001042017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1861472	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P317814	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P318149	
		Sulfate	5.8		mg SO4/L	P318152	
		Color (true)	190		PCU	P317810	
	SM 2320 B-97	Total Alkalinity	2.5		mg CaCO3/L	P317915	
	SM 2540 C-97	TDS	57		mg/L	P318414	
	SM 2540 D-97	TSS	2	U	mg/L	P318206	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P317918	
1861473	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P317986	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P317828	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P318241	
	EPA 365.1 Rev. 2.0	Total-P	0.42		mg P/L	P317885	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P317927	
1861474	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.37		mg P/L	P317797	

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: P317814

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318041

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: P318041

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318149

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318152

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318403

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318404

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317986

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317827

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317828

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318241

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: P317885

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317797

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

Reference Method: SM 2120 B
Batch ID: P317809

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P317810

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P317915

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P318413

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P318414

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P318205

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P318206

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P317918

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P317927

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: P318041

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	93.0		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	103		P	85 - 115
Zinc	87.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318041

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.9		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318041

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	96.7		P	85 - 115
Chromium	93.0		P	85 - 115
Copper	97.9		P	85 - 115
Lead	98.2		P	85 - 115
Nickel	98.6		P	85 - 115
Silver	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318149

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318152

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318403

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318404

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317986

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.2		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318241

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: P317885

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317797

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

Reference Method: SM 2320 B-97
Batch ID: P317915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P317918

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P317927

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318041

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860761	Calcium	104		P	80 - 120
1860761	Iron	107		P	80 - 120
1860761	Magnesium	107		P	80 - 120
1860761	Potassium	105		P	80 - 120
1860761	Sodium	104		P	80 - 120
1860761	Zinc	100		P	80 - 120
1861373	Calcium	99.8		P	80 - 120
1861373	Iron	107	106	P/P	80 - 120
1861373	Magnesium	101		P	80 - 120
1861373	Potassium	107		P	80 - 120
1861373	Zinc	102	100	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318041

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860761	Arsenic	94.0		P	80 - 120
1860761	Cadmium	96.0		P	80 - 120
1860761	Chromium	94.1		P	80 - 120
1860761	Copper	91.6		P	80 - 120
1860761	Lead	96.9		P	80 - 120
1860761	Nickel	94.4		P	80 - 120
1860761	Silver	96.4		P	80 - 120
1861373	Arsenic	103	102	P/P	80 - 120
1861373	Cadmium	99.8	99.9	P/P	80 - 120
1861373	Chromium	89.6	89.8	P/P	80 - 120
1861373	Copper	93.7	94.3	P/P	80 - 120
1861373	Lead	101	102	P/P	80 - 120
1861373	Nickel	95.0	95.3	P/P	80 - 120
1861373	Silver	96.3	96.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861472	Chloride	100		P	90 - 110
1861483	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861472	Sulfate	97.7		P	90 - 110
1861483	Sulfate	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861484	Sulfate	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861484	Chloride	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861443	Ammonia-N	96.0	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861394	Kjeldahl Nitrogen	104	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P317828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861510	Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P318241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861468	NO2NO3-N	101	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P317885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861469	Total-P	96.4	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P317797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861470	O-Phosphate-P	101	98.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P317918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861545	Fluoride	94.0	95.1	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P317927

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861468	Organic Carbon	94.4	94.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P317814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861436	Turbidity	7.69	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P318041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861373	Calcium	3.27	Spike	P	0 - 20
1861373	Iron	1.27	Spike	P	0 - 20
1861373	Magnesium	1.42	Spike	P	0 - 20
1861373	Potassium	0.0604	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861373	Sodium	3.43	Spike	P	0 - 20
1861373	Zinc	1.81	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861373	Arsenic	0.436	Spike	P	0 - 20
1861373	Cadmium	0.174	Spike	P	0 - 20
1861373	Chromium	0.272	Spike	P	0 - 20
1861373	Copper	0.557	Spike	P	0 - 20
1861373	Lead	1.08	Spike	P	0 - 20
1861373	Nickel	0.233	Spike	P	0 - 20
1861373	Silver	0.213	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861483	Chloride	0.0891	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861483	Sulfate	0.342	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861484	Sulfate	0.549	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861484	Chloride	0.0576	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861443	Ammonia-N	1.08	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861394	Kjeldahl Nitrogen	0.452	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861510	Kjeldahl Nitrogen	0.937	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861468	NO2NO3-N	0.820	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861469	Total-P	0.764	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861470	O-Phosphate-P	1.50	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P317809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861438	Color (true)	2.22	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P317810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861530	Color (true)	4.53	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P317915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861545	Total Alkalinity	0.671	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P318413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861358	TDS	0.390	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P318414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861507	TDS	2.72	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P317918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861545	Fluoride	1.02	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P317927

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861468	Organic Carbon	0.0610	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: A73756
Included Lab Sample IDs: 1861470, 1861471, 1861474

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.8	96.8	P/P	90 - 110
O-Phosphate-P	97.8	97.4	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A73759
Included Lab Sample IDs: 1861466, 1861467, 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115
Color (true)	98.7	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A73761
Included Lab Sample IDs: 1861466, 1861467, 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A73761

Included Lab Sample IDs: 1861466, 1861467, 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: SM 2320 B-97

Run ID: A73806

Included Lab Sample IDs: 1861466, 1861467, 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A73806

Included Lab Sample IDs: 1861466, 1861467, 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A73807

Included Lab Sample IDs: 1861468, 1861469, 1861473

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73823

Included Lab Sample IDs: 1861468, 1861469, 1861473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73827

Included Lab Sample IDs: 1861468, 1861469, 1861473

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73829

Included Lab Sample IDs: 1861468, 1861469, 1861473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73881

Included Lab Sample IDs: 1861472

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73881

Included Lab Sample IDs: 1861472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	94.4	98.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A73888

Included Lab Sample IDs: 1861477, 1861478

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A73913

Included Lab Sample IDs: 1861477, 1861478

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73921

Included Lab Sample IDs: 1861468, 1861469, 1861473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A73980

Included Lab Sample IDs: 1861477, 1861478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.8	96.1	P/P	90 - 110
Cadmium	97.6	96.8	P/P	90 - 110
Chromium	92.4	92.2	P/P	90 - 110
Copper	96.7	94.7	P/P	90 - 110
Lead	97.4	96.1	P/P	90 - 110
Nickel	98.2	96.3	P/P	90 - 110
Silver	102	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73993

Included Lab Sample IDs: 1861466, 1861467

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	100	P/P	90 - 110
Sulfate	92.7	97.6	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						7.69	
EPA 200.7 Rev. 4.4	Calcium	104	104	99.8				3.27
	Iron	93.0	107	107	106			1.27
	Magnesium	104	107	101				1.42
	Potassium	104	105	107				0.0604
	Sodium	103	104					3.43
	Zinc	87.6	100	102	100			1.81
EPA 200.8 Rev. 5.4	Arsenic	99.9	94.0	103	102			0.436
	Cadmium	96.7	96.0	99.8	99.9			0.174
	Chromium	93.0	94.1	89.6	89.8			0.272
	Copper	97.9	91.6	94.3	93.7			0.557
	Lead	98.2	96.9	101	102			1.08
	Nickel	98.6	94.4	95.0	95.3			0.233
	Silver	98.7	96.4	96.3	96.5			0.213
EPA 300.0 Rev. 2.1	Chloride	101	99.4	100			0.0891	
	Chloride	103	104				0.0576	
	Sulfate	98.8	98.2	97.7			0.342	
	Sulfate	99.3	101				0.549	
EPA 350.1 Rev. 2.0	Ammonia-N	101	96.0	97.2				1.08
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.1	104	104				0.452
	Kjeldahl Nitrogen	93.2	103	105				0.937
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	99.8				0.820
EPA 365.1 Rev. 2.0	Total-P	99.2	96.4	97.3				0.764
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	101	98.7				1.50
SM 2120 B	Color (true)						2.22	
	Color (true)						4.53	
SM 2320 B-97	Total Alkalinity	104					0.671	
SM 2540 C-97	TDS						0.390	
	TDS						2.72	
SM 4500 F-C-97	Fluoride	96.0	94.0	95.1				1.02
SM 5310 B-00	Organic Carbon	93.2	94.4	94.6				0.0610

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1861466, 1861467, 1861472
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1861477, 1861478
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1861477, 1861478
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1861466, 1861467, 1861472
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1861466, 1861467, 1861472
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1861468, 1861469, 1861473
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1861468, 1861469, 1861473
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1861468, 1861469, 1861473
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1861468, 1861469, 1861473
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1861470, 1861471, 1861474

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2120 B / E31780	True Color measured at 450 nm	1861466, 1861467, 1861472
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1861466, 1861467, 1861472
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1861466, 1861467, 1861472
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1861466, 1861467, 1861472
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1861466, 1861467, 1861472
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1861468, 1861469, 1861473

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	01/05/2017			01/05/2017 16:07	Sima Feizi	1861466, 1861467, 1861472
EPA 200.7 Rev. 4.4	01/05/2017	01/10/2017	Elliott D. Healy	01/12/2017	Joshua Ayres	1861477, 1861478
EPA 200.8 Rev. 5.4	01/05/2017	01/10/2017	Elliott D. Healy	01/18/2017	Betina Topolski	1861477, 1861478
EPA 300.0 Rev. 2.1	01/05/2017			01/11/2017	Ping Hua	1861472
	01/05/2017			01/19/2017	Ping Hua	1861466, 1861467
EPA 350.1 Rev. 2.0	01/05/2017			01/09/2017	Sofia Elnemr	1861468, 1861469, 1861473
EPA 351.2 Rev. 2.0	01/05/2017	01/06/2017	Adrian Shelby	01/09/2017	Joseph Suarez	1861468, 1861469, 1861473
EPA 353.2 Rev. 2.0	01/05/2017			01/13/2017	Beverly Y. Sanders	1861468, 1861469, 1861473
EPA 365.1 Rev. 2.0	01/05/2017	01/06/2017	Vijayalakshmi Reddy	01/09/2017	Beverly Y. Sanders	1861468, 1861469, 1861473
EPA 365.1 Rev. 2.0 dissolved	01/05/2017			01/05/2017 13:47	Lipi Saha	1861470
	01/05/2017			01/05/2017 13:50	Lipi Saha	1861471
	01/05/2017			01/05/2017 14:15	Lipi Saha	1861474
SM 2120 B	01/05/2017			01/05/2017 15:35	Jared I. Manley	1861466, 1861467
	01/05/2017			01/05/2017 16:03	Jared I. Manley	1861472
SM 2320 B-97	01/05/2017			01/07/2017	Dale L. Simmons	1861466, 1861467, 1861472
SM 2540 C-97	01/05/2017			01/09/2017	Sima Feizi	1861466, 1861467, 1861472
SM 2540 D-97	01/05/2017			01/09/2017	Sima Feizi	1861466, 1861467, 1861472
SM 4500 F-C-97	01/05/2017			01/07/2017	Dale L. Simmons	1861466, 1861467, 1861472
SM 5310 B-00	01/05/2017			01/06/2017	Julie Michelle Frank	1861468, 1861469, 1861473