

Chemical Analysis Report

NE-DIST-2018-09-27-02

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

Event Description: **LSJR SouthWest 2**
Request ID: **RQ-2018-09-24-07**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 25-OCT-2018 11:41

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: NE ROC DI

Collection Date/Time: 09/26/2018 09:35

Field ID: BLANK 09262018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028803	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P352473	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P352729	
	SM 2120 B	Color (true)	2.5	U	PCU	P352384	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P352908	
	SM 2540 C-97	TDS	15	U	mg/L	P353177	
	SM 2540 D-97	TSS	2	U	mg/L	P353075	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353028	
2028804	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P353011	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P352544	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352699	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P352462	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P352976	
2028805	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352433	
2028826	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P352534	
		Iron	30	U	ug/L	P352534	
		Magnesium	0.040	U	mg/L	P352534	
		Potassium	0.30	U	mg/L	P352534	
		Sodium	0.50	U	mg/L	P352534	
		Zinc	5.0	U	ug/L	P352534	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P352534	
		Cadmium	0.020	U	ug/L	P352534	
		Chromium	0.40	U	ug/L	P352534	
		Copper	0.20	U	ug/L	P352534	
		Lead	0.050	U	ug/L	P352534	
		Nickel	0.20	U	ug/L	P352534	
		Silver	0.010	U	ug/L	P352534	

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: MILL CR @ SR 16

Collection Date/Time: 09/26/2018 10:45

Field ID: 20030474

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028794	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P352473	
	EPA 300.0 Rev. 2.1	Chloride	92		mg Cl/L	P352728	
		Sulfate	79		mg SO4/L	P352729	
	SM 2120 B	Color (true)	38		PCU	P352384	
	SM 2320 B-97	Total Alkalinity	129		mg CaCO3/L	P352905	
	SM 2540 C-97	TDS	443	A	mg/L	P353177	
	SM 2540 D-97	TSS	2	UA	mg/L	P353075	
	SM 4500 F-C-97	Fluoride	0.38		mg F/L	P352723	
2028795	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P353011	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P352544	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.39		mg N/L	P352494	
	EPA 365.1 Rev. 2.0	Total-P	0.42		mg P/L	P352461	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P352976	
2028796	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.34		mg P/L	P352433	

Ref. Method and Comment:

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

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: PETERS CREEK CULVERT SR 315

Collection Date/Time: 09/26/2018 09:15

Field ID: 20030388

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028797	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P352473	
	EPA 300.0 Rev. 2.1	Chloride	8.3		mg Cl/L	P352728	
		Sulfate	3.5		mg SO4/L	P352729	
		Color (true)	120	A	PCU	P352384	
	SM 2320 B-97	Total Alkalinity	2.9		mg CaCO3/L	P352908	
	SM 2540 C-97	TDS	52		mg/L	P353177	
	SM 2540 D-97	TSS	2	U	mg/L	P353075	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353028	
2028799	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P353011	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P352544	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352494	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P352462	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P352976	
2028801	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P352433	
2028824	EPA 200.7 Rev. 4.4	Calcium	3.09		mg/L	P352534	
		Iron	490		ug/L	P352534	
		Magnesium	0.72		mg/L	P352534	
		Potassium	0.33	I	mg/L	P352534	
		Sodium	5.1		mg/L	P352534	
		Zinc	5.0	U	ug/L	P352534	
	EPA 200.8 Rev. 5.4	Arsenic	0.25		ug/L	P352534	
		Cadmium	0.020	U	ug/L	P352534	
		Chromium	0.40	U	ug/L	P352534	
		Copper	0.20	U	ug/L	P352534	
		Lead	0.21		ug/L	P352534	
		Nickel	0.23	I	ug/L	P352534	
		Silver	0.010	U	ug/L	P352534	

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: PETERS CREEK AT SR # 16

Collection Date/Time: 09/26/2018 09:50

Field ID: 20030403

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028798	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P352473	
	EPA 300.0 Rev. 2.1	Chloride	8.2		mg Cl/L	P352728	
		Sulfate	3.7		mg SO4/L	P352729	
		Color (true)	200		PCU	P352384	
	SM 2320 B-97	Total Alkalinity	6.1		mg CaCO3/L	P352908	
	SM 2540 C-97	TDS	67		mg/L	P353177	
	SM 2540 D-97	TSS	2	U	mg/L	P353075	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P353028	
2028800	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P353011	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P352544	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P352494	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P352462	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P352976	
2028802	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P352433	
2028825	EPA 200.7 Rev. 4.4	Calcium	5.05		mg/L	P352534	
		Iron	460		ug/L	P352534	
		Magnesium	0.87		mg/L	P352534	
		Potassium	0.45	I	mg/L	P352534	
		Sodium	4.8		mg/L	P352534	
		Zinc	5.0	U	ug/L	P352534	
	EPA 200.8 Rev. 5.4	Arsenic	0.28		ug/L	P352534	
		Cadmium	0.020	U	ug/L	P352534	
		Chromium	0.40	U	ug/L	P352534	
		Copper	0.20	U	ug/L	P352534	
		Lead	0.25		ug/L	P352534	
		Nickel	0.23	I	ug/L	P352534	
		Silver	0.010	U	ug/L	P352534	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352473

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352534

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: P352534

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: P352728

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352729

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353011

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352544

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: P352494

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352699

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352461

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352462

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352433

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

Reference Method: SM 2120 B
Batch ID: P352384

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P352905

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

Reference Method: SM 2320 B-97
Batch ID: P352908

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

Reference Method: SM 2540 C-97
Batch ID: P353177

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P353075

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P352723

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P353028

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P352976

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: P352534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	95.4		P	85 - 115
Iron	92.9		P	85 - 115
Magnesium	99.1		P	85 - 115
Potassium	97.8		P	85 - 115
Sodium	97.9		P	85 - 115
Zinc	93.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	109		P	85 - 115
Chromium	106		P	85 - 115
Copper	106		P	80 - 120
Lead	107		P	85 - 115
Nickel	102		P	85 - 115
Silver	108		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352728

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353011

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352544

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352494

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352699

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352461

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352462

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352433

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

Reference Method: SM 2120 B
Batch ID: P352384

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.6		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P352905

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

Reference Method: SM 2320 B-97
Batch ID: P352908

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

Reference Method: SM 4500 F-C-97
Batch ID: P352723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P353028

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P352976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028663	Calcium	95.8		P	80 - 120
2028663	Iron	93.2		P	80 - 120
2028663	Magnesium	101		P	80 - 120
2028663	Potassium	103		P	80 - 120
2028663	Sodium	96.6		P	80 - 120
2028663	Zinc	95.1		P	80 - 120
2028883	Calcium	91.5	90.0	P/P	80 - 120
2028883	Iron	90.0	87.0	P/P	80 - 120
2028883	Magnesium	95.8	93.4	P/P	80 - 120
2028883	Potassium	96.6	94.2	P/P	80 - 120
2028883	Sodium	91.8	87.3	P/P	80 - 120
2028883	Zinc	91.9	88.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028663	Arsenic	104		P	80 - 120
2028663	Cadmium	104		P	80 - 120
2028663	Chromium	104		P	80 - 120
2028663	Copper	104		P	80 - 120
2028663	Lead	104		P	80 - 120
2028663	Nickel	102		P	80 - 120
2028663	Silver	106		P	80 - 120
2028883	Arsenic	103	101	P/P	80 - 120
2028883	Cadmium	110	105	P/P	80 - 120
2028883	Chromium	108	104	P/P	80 - 120
2028883	Copper	103	100	P/P	80 - 120
2028883	Lead	107	104	P/P	80 - 120
2028883	Nickel	100	98.6	P/P	80 - 120
2028883	Silver	107	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352728

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028746	Chloride	98.7		P	90 - 110
2028861	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028746	Sulfate	95.8		P	90 - 110
2028861	Sulfate	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353011

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028790	Ammonia-N	97.6	98.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028795	Kjeldahl Nitrogen	99.0	97.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352494

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028790	NO2NO3-N	98.8	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352699

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028841	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028842	Total-P	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028714	O-Phosphate-P	99.1	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P352723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2029484	Fluoride	100	99.2	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P353028

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028976	Fluoride	98.3	98.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028840	Organic Carbon	98.0	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028788	Turbidity	8.03	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028883	Calcium	1.18	Spike	P	0 - 20
2028883	Iron	3.18	Spike	P	0 - 20
2028883	Magnesium	2.26	Spike	P	0 - 20
2028883	Potassium	2.52	Spike	P	0 - 20
2028883	Sodium	2.83	Spike	P	0 - 20
2028883	Zinc	4.33	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028883	Arsenic	1.86	Spike	P	0 - 20
2028883	Cadmium	5.01	Spike	P	0 - 20
2028883	Chromium	3.63	Spike	P	0 - 20
2028883	Copper	2.49	Spike	P	0 - 20
2028883	Lead	2.46	Spike	P	0 - 20
2028883	Nickel	1.46	Spike	P	0 - 20
2028883	Silver	1.60	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028746	Chloride	0.204	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028746	Sulfate	1.54	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028790	Ammonia-N	0.922	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028795	Kjeldahl Nitrogen	0.746	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028790	NO2NO3-N	0.870	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352699

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028841	NO2NO3-N	0.442	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028795	Total-P	0.223	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028842	Total-P	2.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028714	O-Phosphate-P	1.00	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P352384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028797	Color (true)	0.597	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P352905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2029484	Total Alkalinity	0.0763	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P352908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028976	Total Alkalinity	1.36	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P353177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028794	TDS	0.903	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P352723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2029484	Fluoride	0.983	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P353028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028976	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P352976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028840	Organic Carbon	0.160	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: A86754

Included Lab Sample IDs: 2028794, 2028797, 2028798, 2028803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.3	98.0	P/P	90 - 115
Color (true)	99.2	99.5	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86767

Included Lab Sample IDs: 2028796, 2028801, 2028802, 2028805

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.4	97.2	P/P	90 - 110
O-Phosphate-P	98.5	99.5	P/P	90 - 110
O-Phosphate-P	98.8	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86787

Included Lab Sample IDs: 2028794, 2028797, 2028798, 2028803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86790

Included Lab Sample IDs: 2028795, 2028799, 2028800

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86831

Included Lab Sample IDs: 2028799, 2028800, 2028804

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86833

Included Lab Sample IDs: 2028795

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86839

Included Lab Sample IDs: 2028794, 2028797, 2028798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	101	99.9	P/P	90 - 110
Sulfate	99.9	98.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86849

Included Lab Sample IDs: 2028824, 2028825, 2028826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.8	96.1	P/P	90 - 110
Calcium	97.3	96.8	P/P	95 - 105
Iron	97.4	95.9	P/P	90 - 110
Iron	98.2	97.4	P/P	95 - 105
Magnesium	98.3	97.0	P/P	90 - 110
Magnesium	98.7	98.3	P/P	95 - 105
Potassium	98.6	99.6	P/P	95 - 105
Potassium	99.6	98.1	P/P	90 - 110
Sodium	99.1	97.9	P/P	90 - 110
Sodium	99.7	99.1	P/P	95 - 105
Zinc	100	101	P/P	95 - 105
Zinc	101	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86890

Included Lab Sample IDs: 2028804

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

Reference Method: SM 4500 F-C-97

Run ID: A86892

Included Lab Sample IDs: 2028794

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	105	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86924

Included Lab Sample IDs: 2028795, 2028799, 2028800, 2028804

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

Reference Method: SM 2320 B-97

Run ID: A86962

Included Lab Sample IDs: 2028794, 2028797, 2028798, 2028803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A86991

Included Lab Sample IDs: 2028795, 2028799, 2028800, 2028804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.9	94.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87005

Included Lab Sample IDs: 2028824, 2028825, 2028826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	100	P/P	90 - 110
Arsenic	99.1	99.9	P/P	90 - 110
Cadmium	103	106	P/P	90 - 110
Cadmium	106	103	P/P	90 - 110
Chromium	102	105	P/P	90 - 110
Chromium	105	102	P/P	90 - 110
Copper	104	100	P/P	90 - 110
Lead	103	105	P/P	90 - 110
Lead	105	104	P/P	90 - 110
Nickel	102	99.8	P/P	90 - 110
Nickel	99.5	101	P/P	90 - 110
Silver	102	104	P/P	90 - 110
Silver	104	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87010

Included Lab Sample IDs: 2028795, 2028799, 2028800, 2028804

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

Reference Method: SM 4500 F-C-97

Run ID: A87013

Included Lab Sample IDs: 2028797, 2028798, 2028803

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87239

Included Lab Sample IDs: 2028826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	99.7	99.6	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			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					8.03	
EPA 200.7 Rev. 4.4	Calcium	95.4	95.8	91.5	90.0		1.18
	Iron	92.9	93.2	90.0	87.0		3.18
	Magnesium	99.1	101	95.8	93.4		2.26
	Potassium	97.8	103	96.6	94.2		2.52
	Sodium	97.9	96.6	91.8	87.3		2.83
	Zinc	93.4	95.1	91.9	88.0		4.33
EPA 200.8 Rev. 5.4	Arsenic	103	104	103	101		1.86
	Cadmium	109	104	110	105		5.01
	Chromium	106	104	108	104		3.63
	Copper	106	104	103	100		2.49
	Lead	107	104	107	104		2.46
	Nickel	102	102	100	98.6		1.46
	Silver	108	106	107	105		1.60
EPA 300.0 Rev. 2.1	Chloride	102	98.7	102		0.204	
	Sulfate	98.2	95.8	97.5		1.54	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	97.6	98.6			0.922
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	99.0	97.7			0.746
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.8	97.8			0.870
	NO2NO3-N	99.0	101	102			0.442
EPA 365.1 Rev. 2.0	Total-P	102					0.223
	Total-P	104	102	100			2.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.1	97.7			1.00
SM 2120 B	Color (true)	97.6				0.597	
SM 2320 B-97	Total Alkalinity	103				0.0763	
	Total Alkalinity	103				1.36	
SM 2540 C-97	TDS					0.903	
SM 4500 F-C-97	Fluoride	99.8	100	99.2			0.983
	Fluoride	99.4	98.3	98.3			0.0
SM 5310 B-00	Organic Carbon	97.9	98.0	97.8			0.160

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2028794, 2028797, 2028798, 2028803
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2028824, 2028825, 2028826
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2028824, 2028825, 2028826
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2028794, 2028797, 2028798
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2028794, 2028797, 2028798, 2028803
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2028795, 2028799, 2028800, 2028804
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2028795, 2028799, 2028800, 2028804
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2028795, 2028799, 2028800, 2028804
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2028795, 2028799, 2028800, 2028804
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2028796, 2028801, 2028802, 2028805
SM 2120 B / E31780	True Color measured at 450 nm	2028794, 2028797, 2028798, 2028803

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2028794, 2028797, 2028798, 2028803
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2028794, 2028797, 2028798, 2028803
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2028794, 2028797, 2028798, 2028803
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2028794, 2028797, 2028798, 2028803
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2028795, 2028799, 2028800, 2028804

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	09/27/2018			09/27/2018 15:54	Megan Treadwell	2028794, 2028797, 2028798, 2028803
EPA 200.7 Rev. 4.4	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/02/2018 13:00	Betina Topolski	2028826
	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/02/2018 14:05	Betina Topolski	2028824
	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/02/2018 14:10	Betina Topolski	2028825
EPA 200.8 Rev. 5.4	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/09/2018 01:25	Allison Taylor	2028826
	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/09/2018 04:57	Allison Taylor	2028824
	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/09/2018 05:06	Allison Taylor	2028825
	09/27/2018	10/01/2018 14:40	Elliott D. Healy	10/22/2018 18:13	Allison Taylor	2028826
EPA 300.0 Rev. 2.1	09/27/2018			10/03/2018 19:00	Lipi Saha	2028794
	09/27/2018			10/03/2018 19:12	Lipi Saha	2028797
	09/27/2018			10/03/2018 19:25	Lipi Saha	2028798
	09/27/2018			10/03/2018 21:41	Lipi Saha	2028803
EPA 350.1 Rev. 2.0	09/27/2018			10/03/2018 11:51	Ping Hua	2028795
	09/27/2018			10/03/2018 11:52	Ping Hua	2028799
	09/27/2018			10/03/2018 11:54	Ping Hua	2028800
	09/27/2018			10/03/2018 11:55	Ping Hua	2028804
EPA 351.2 Rev. 2.0	09/27/2018	10/01/2018 11:45	Adrian Shelby	10/04/2018 15:39	Joseph Suarez	2028795
	09/27/2018	10/01/2018 11:45	Adrian Shelby	10/04/2018 15:47	Joseph Suarez	2028799
	09/27/2018	10/01/2018 11:45	Adrian Shelby	10/04/2018 15:49	Joseph Suarez	2028800
	09/27/2018	10/01/2018 11:45	Adrian Shelby	10/04/2018 15:50	Joseph Suarez	2028804
EPA 353.2 Rev. 2.0	09/27/2018			09/28/2018 15:11	Lauren Bottorf	2028795
	09/27/2018			09/28/2018 15:12	Lauren Bottorf	2028799
	09/27/2018			09/28/2018 15:13	Lauren Bottorf	2028800
	09/27/2018			10/03/2018 12:04	Lauren Bottorf	2028804
EPA 365.1 Rev. 2.0	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 09:31	Beverly Y. Sanders	2028795
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:13	Beverly Y. Sanders	2028804
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:20	Beverly Y. Sanders	2028799
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:21	Beverly Y. Sanders	2028800
EPA 365.1 Rev. 2.0 dissolved	09/27/2018			09/27/2018 15:52	Julia Storbeck	2028801
	09/27/2018			09/27/2018 15:57	Julia Storbeck	2028802
	09/27/2018			09/27/2018 15:58	Julia Storbeck	2028805
	09/27/2018			09/27/2018 16:50	Julia Storbeck	2028796
SM 2120 B	09/27/2018			09/27/2018 14:21	DeAsia Armster	2028794
	09/27/2018			09/27/2018 14:23	DeAsia Armster	2028797
	09/27/2018			09/27/2018 14:24	DeAsia Armster	2028803
	09/27/2018			09/27/2018 14:49	DeAsia Armster	2028798
SM 2320 B-97	09/27/2018			10/08/2018 01:24	Dale L. Simmons	2028794
	09/27/2018			10/08/2018 03:16	Dale L. Simmons	2028797
	09/27/2018			10/08/2018 03:24	Dale L. Simmons	2028798
	09/27/2018			10/08/2018 03:31	Dale L. Simmons	2028803

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 C-97	09/27/2018			10/01/2018 11:35	DeAsia Armster	2028794, 2028797, 2028798, 2028803
SM 2540 D-97	09/27/2018			10/01/2018 11:35	DeAsia Armster	2028794, 2028797, 2028798, 2028803
SM 4500 F-C-97	09/27/2018			10/03/2018 03:11	Dale L. Simmons	2028794
	09/27/2018			10/09/2018 15:11	Dale L. Simmons	2028797
	09/27/2018			10/09/2018 15:16	Dale L. Simmons	2028798
	09/27/2018			10/09/2018 15:20	Dale L. Simmons	2028803
SM 5310 B-00	09/27/2018			10/04/2018 05:26	Megan Treadwell	2028795
	09/27/2018			10/04/2018 05:39	Megan Treadwell	2028799
	09/27/2018			10/04/2018 05:52	Megan Treadwell	2028800
	09/27/2018			10/04/2018 06:06	Megan Treadwell	2028804