Chemical Analysis Report

NE-DIST-2019-04-11-04

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

Event Description: **LSJR Palatka**
Request ID: **RQ-2019-04-01-17**
Customer: **NE-DIST**
Project ID: **SMP**

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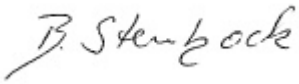
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 02-MAY-2019 18:13



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: MOCCASSIN BRANCH AT WINFORD MASTERS RD **Collection Date/Time: 04/10/2019 14:10**

Field ID: 20030557 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2077470	EPA 180.1 Rev. 2.0	Turbidity	4.1		NTU	P362003	
	EPA 300.0 Rev. 2.1	Chloride	65		mg Cl/L	P362299	
		Sulfate	88		mg SO4/L	P362302	
	SM 2120 B	Color (true)	200		PCU	P362030	
	SM 2320 B-97	Total Alkalinity	69		mg CaCO3/L	P362275	
	SM 2540 C-97	TDS	398		mg/L	P362629	
	SM 2540 D-97	TSS	2	I	mg/L	P362203	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P362278	
2077472	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P362561	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P362547	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P362492	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P362350	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P362315	
2077474	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P362018	
2077485	EPA 200.7 Rev. 4.4	Barium	20.3		ug/L	P362169	
		Calcium	49.2		mg/L	P362169	
		Iron	1.04E+03		ug/L	P362169	
		Magnesium	12.3		mg/L	P362169	
		Potassium	2.9		mg/L	P362169	
		Sodium	29.5		mg/L	P362169	
		Zinc	5.9	I	ug/L	P362169	
	EPA 200.8 Rev. 5.4	Aluminum	262		ug/L	P362169	
		Antimony	0.12	I	ug/L	P362169	
		Arsenic	0.89		ug/L	P362169	
		Boron**	41.7		ug/L	P362169	
		Cadmium	0.020	U	ug/L	P362169	
		Chromium	1.2	I	ug/L	P362169	
		Copper	1.25		ug/L	P362169	
		Lead	0.36	I	ug/L	P362169	
		Nickel	0.74	I	ug/L	P362169	
		Selenium	0.28	I	ug/L	P362169	
		Silver	0.010	U	ug/L	P362169	
		Thallium	0.10	U	ug/L	P362169	

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 BR. @ OLD SAN MATEO RD. **Collection Date/Time: 04/10/2019 11:45**

Field ID: 20030577 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2077476	EPA 180.1 Rev. 2.0	Turbidity	7.5	A	NTU	P362003	
	EPA 300.0 Rev. 2.1	Chloride	180		mg Cl/L	P362299	
		Sulfate	81		mg SO4/L	P362302	
	SM 2120 B	Color (true)	210		PCU	P362030	
	SM 2320 B-97	Total Alkalinity	71		mg CaCO3/L	P362275	
	SM 2540 C-97	TDS	583		mg/L	P362629	
	SM 2540 D-97	TSS	5	I	mg/L	P362203	
	SM 4500 F-C-97	Fluoride	0.28		mg F/L	P362278	
2077477	EPA 350.1 Rev. 2.0	Ammonia-N	0.059		mg N/L	P362561	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P362547	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P362493	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P362350	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P362313	
2077478	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P362018	
2077487	EPA 200.7 Rev. 4.4	Barium	22.6		ug/L	P362169	
		Calcium	53.5		mg/L	P362169	
		Iron	1.59E+03		ug/L	P362169	
		Magnesium	18.7		mg/L	P362169	
		Potassium	4.1		mg/L	P362169	
		Sodium	68.3		mg/L	P362169	
		Zinc	6.5	I	ug/L	P362169	
	EPA 200.8 Rev. 5.4	Aluminum	209		ug/L	P362169	
		Antimony	0.11	I	ug/L	P362169	
		Arsenic	0.95		ug/L	P362169	
		Boron**	50.9		ug/L	P362169	
		Cadmium	0.024	I	ug/L	P362169	
		Chromium	1.2	I	ug/L	P362169	
		Copper	1.59		ug/L	P362169	
		Lead	0.38	I	ug/L	P362169	
		Nickel	0.92	I	ug/L	P362169	
		Selenium	0.27	I	ug/L	P362169	
		Silver	0.010	U	ug/L	P362169	
		Thallium	0.10	U	ug/L	P362169	

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: Bull Creek Canal 0.5M Upstr of Dead Lake **Collection Date/Time: 04/10/2019 10:40**

Field ID: G2NE1182 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2077471	EPA 180.1 Rev. 2.0	Turbidity	5.5		NTU	P362003	
	EPA 300.0 Rev. 2.1	Chloride	280		mg Cl/L	P362299	
		Sulfate	100		mg SO4/L	P362302	
	SM 2120 B	Color (true)	150		PCU	P362030	
	SM 2320 B-97	Total Alkalinity	76		mg CaCO3/L	P362275	
	SM 2540 C-97	TDS	758		mg/L	P362629	
	SM 2540 D-97	TSS	6	I	mg/L	P362203	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P362278	
2077473	EPA 350.1 Rev. 2.0	Ammonia-N	0.061		mg N/L	P362561	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P362547	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P362492	
	EPA 365.1 Rev. 2.0	Total-P	0.36		mg P/L	P362350	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P362313	
2077475	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.27		mg P/L	P362018	
2077486	EPA 200.7 Rev. 4.4	Barium	30.2		ug/L	P362169	
		Calcium	69.2		mg/L	P362169	
		Iron	410		ug/L	P362169	
		Magnesium	26.2		mg/L	P362169	
		Potassium	4.7		mg/L	P362169	
		Sodium	102		mg/L	P362169	
		Zinc	5.0	U	ug/L	P362169	
	EPA 200.8 Rev. 5.4	Aluminum	138		ug/L	P362169	
		Antimony	0.12	I	ug/L	P362169	
		Arsenic	1.04		ug/L	P362169	
		Boron**	50.7		ug/L	P362169	
		Cadmium	0.039	I	ug/L	P362169	
		Chromium	0.64	I	ug/L	P362169	
		Copper	4.06		ug/L	P362169	
		Lead	0.35	I	ug/L	P362169	
		Nickel	0.50	U	ug/L	P362169	
		Selenium	0.20	U	ug/L	P362169	
		Silver	0.010	U	ug/L	P362169	
		Thallium	0.10	U	ug/L	P362169	

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: P362003

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362169

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P362169

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362299

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362302

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362561

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: P362547

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362492

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362493

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362350

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362018

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

Reference Method: SM 2120 B
Batch ID: P362030

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P362275

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

Reference Method: SM 2540 C-97
Batch ID: P362629

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P362203

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P362278

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P362313

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P362315

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: P362169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.9		P	85 - 115
Calcium	93.1		P	85 - 115
Iron	97.0		P	85 - 115
Magnesium	98.5		P	85 - 115
Potassium	92.5		P	85 - 115
Sodium	89.8		P	85 - 115
Zinc	98.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	87.4		P	85 - 115
Arsenic	90.7		P	85 - 115
Boron	101		P	85 - 115
Cadmium	90.3		P	85 - 115
Chromium	99.1		P	85 - 115
Copper	103		P	85 - 115
Lead	96.9		P	85 - 115
Nickel	104		P	85 - 115
Selenium	103		P	85 - 115
Silver	102		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362299

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362302

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362561

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362547

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362492

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362493

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: P362350

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: P362018

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

Reference Method: SM 2120 B
Batch ID: P362030

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

Reference Method: SM 2320 B-97
Batch ID: P362275

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P362278

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P362313

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.5		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P362315

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: P362169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077466	Barium	96.5	96.7	P/P	80 - 120
2077466	Calcium	92.2		P	80 - 120
2077466	Iron	95.7	97.7	P/P	80 - 120
2077466	Magnesium	93.7	97.6	P/P	80 - 120
2077466	Potassium	88.9	93.3	P/P	80 - 120
2077466	Sodium	91.2		P	80 - 120
2077466	Zinc	98.3	98.1	P/P	80 - 120
2077535	Barium	97.1		P	80 - 120
2077535	Calcium	92.6		P	80 - 120
2077535	Iron	96.0		P	80 - 120
2077535	Magnesium	93.7		P	80 - 120
2077535	Potassium	89.8		P	80 - 120
2077535	Sodium	93.5		P	80 - 120
2077535	Zinc	99.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077466	Aluminum	100	100	P/P	80 - 120
2077466	Antimony	108	107	P/P	80 - 120
2077466	Arsenic	92.0	92.5	P/P	80 - 120
2077466	Boron	100	99.4	P/P	80 - 120
2077466	Cadmium	92.0	89.5	P/P	80 - 120
2077466	Chromium	97.3	96.7	P/P	80 - 120
2077466	Copper	102	101	P/P	80 - 120
2077466	Lead	99.0	98.9	P/P	80 - 120
2077466	Nickel	105	104	P/P	80 - 120
2077466	Selenium	107	104	P/P	80 - 120
2077466	Silver	99.5	98.5	P/P	80 - 120
2077466	Thallium	110	111	P/P	80 - 120
2077535	Aluminum	99.6		P	80 - 120
2077535	Antimony	109		P	80 - 120
2077535	Arsenic	95.2		P	80 - 120
2077535	Boron	95.3		P	80 - 120
2077535	Cadmium	91.1		P	80 - 120
2077535	Chromium	96.9		P	80 - 120
2077535	Copper	103		P	80 - 120
2077535	Lead	99.9		P	80 - 120
2077535	Nickel	105		P	80 - 120
2077535	Selenium	108		P	80 - 120
2077535	Silver	99.5		P	80 - 120
2077535	Thallium	113		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077574	Chloride	101		P	90 - 110
2077580	Chloride	102		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077574	Sulfate	103		P	90 - 110
2077580	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362561

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077454	Ammonia-N	98.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362547

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077454	Kjeldahl Nitrogen	104	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077406	NO2NO3-N	99.3	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077477	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077451	Total-P	101	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077578	O-Phosphate-P	96.9	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P362278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077450	Fluoride	99.0	99.6	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P362313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077582	Organic Carbon	99.9	100	P/P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P362315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2077772	Organic Carbon	103	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P362003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077476	Turbidity	4.53	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077466	Barium	0.195	Spike	P	0 - 20
2077466	Calcium	1.75	Spike	P	0 - 20
2077466	Iron	2.01	Spike	P	0 - 20
2077466	Magnesium	2.16	Spike	P	0 - 20
2077466	Potassium	2.61	Spike	P	0 - 20
2077466	Sodium	2.22	Spike	P	0 - 20
2077466	Zinc	0.177	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077466	Aluminum	0.121	Spike	P	0 - 20
2077466	Antimony	0.675	Spike	P	0 - 20
2077466	Arsenic	0.476	Spike	P	0 - 20
2077466	Boron	0.702	Spike	P	0 - 20
2077466	Cadmium	2.78	Spike	P	0 - 20
2077466	Chromium	0.580	Spike	P	0 - 20
2077466	Copper	0.268	Spike	P	0 - 20
2077466	Lead	0.174	Spike	P	0 - 20
2077466	Nickel	0.935	Spike	P	0 - 20
2077466	Selenium	2.61	Spike	P	0 - 20
2077466	Silver	1.08	Spike	P	0 - 20
2077466	Thallium	0.810	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077574	Chloride	0.0275	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077574	Sulfate	0.196	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077454	Ammonia-N	1.48	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362547

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077454	Kjeldahl Nitrogen	0.388	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077406	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077477	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077451	Total-P	5.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362018

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077578	O-Phosphate-P	1.75	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P362030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077453	Color (true)	0.748	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P362275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077450	Total Alkalinity	0.356	Sample	P	0 - 2.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P362629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077389	TDS	1.51	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P362278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077450	Fluoride	0.527	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P362313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077582	Organic Carbon	0.286	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P362315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2077772	Organic Carbon	0.0	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 180.1 Rev. 2.0
Run ID: A90636
Included Lab Sample IDs: 2077470, 2077471, 2077476

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A90643
Included Lab Sample IDs: 2077474, 2077475, 2077478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.8	96.5	P/P	90 - 110
O-Phosphate-P	98.9	97.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A90648
Included Lab Sample IDs: 2077470, 2077471, 2077476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A90755
Included Lab Sample IDs: 2077485, 2077486, 2077487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.5	P/P	90 - 110
Barium	99.5	99.0	P/P	90 - 110
Calcium	95.7	95.0	P/P	90 - 110
Calcium	95.9	95.7	P/P	90 - 110
Iron	96.8	96.4	P/P	90 - 110
Iron	96.8	96.8	P/P	90 - 110
Magnesium	96.2	95.8	P/P	90 - 110
Magnesium	96.9	96.2	P/P	90 - 110
Potassium	94.3	94.4	P/P	90 - 110
Potassium	94.4	95.1	P/P	90 - 110
Sodium	92.3	94.4	P/P	90 - 110
Sodium	94.4	94.9	P/P	90 - 110
Zinc	98.5	98.0	P/P	90 - 110
Zinc	99.2	98.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A90759
Included Lab Sample IDs: 2077470, 2077471, 2077476

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

Reference Method: SM 4500 F-C-97
Run ID: A90759
Included Lab Sample IDs: 2077470, 2077471, 2077476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A90760
Included Lab Sample IDs: 2077470, 2077471, 2077476

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

Reference Method: SM 5310 B-00
Run ID: A90771
Included Lab Sample IDs: 2077472, 2077473, 2077477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110
Organic Carbon	106	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A90830
Included Lab Sample IDs: 2077472, 2077473, 2077477

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A90845
Included Lab Sample IDs: 2077472, 2077473, 2077477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A90870
Included Lab Sample IDs: 2077472, 2077473, 2077477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110
Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A90881
Included Lab Sample IDs: 2077472, 2077473, 2077477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	99.1	P/P	90 - 110
Kjeldahl Nitrogen	99.1	98.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A90981
Included Lab Sample IDs: 2077485, 2077486, 2077487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	91.1	91.5	P/P	90 - 110
Cadmium	90.5	90.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A91051
Included Lab Sample IDs: 2077485, 2077486, 2077487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.2	97.2	P/P	90 - 110
Antimony	103	103	P/P	90 - 110
Boron	95.9	93.5	P/P	90 - 110
Chromium	100	99.5	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	93.7	93.7	P/P	90 - 110
Nickel	101	102	P/P	90 - 110
Selenium	99.9	101	P/P	90 - 110
Silver	97.8	97.7	P/P	90 - 110
Thallium	100	99.9	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.53	
EPA 200.7 Rev. 4.4	Barium	99.9	96.5	96.7	97.1			0.195
	Calcium	93.1	92.2	92.6				1.75
	Iron	97.0	95.7	97.7	96.0			2.01
	Magnesium	98.5	93.7	97.6	93.7			2.16
	Potassium	92.5	88.9	93.3	89.8			2.61
	Sodium	89.8	91.2	93.5				2.22
	Zinc	98.9	98.3	98.1	99.6			0.177
EPA 200.8 Rev. 5.4	Aluminum	102	100	100	99.6			0.121
	Antimony	87.4	108	107	109			0.675
	Arsenic	90.7	92.0	92.5	95.2			0.476
	Boron	101	100	99.4	95.3			0.702
	Cadmium	90.3	92.0	89.5	91.1			2.78
	Chromium	99.1	97.3	96.7	96.9			0.580
	Copper	103	102	101	103			0.268
	Lead	96.9	99.0	98.9	99.9			0.174
	Nickel	104	105	104	105			0.935
	Selenium	103	107	104	108			2.61
	Silver	102	99.5	98.5	99.5			1.08
	Thallium	107	110	111	113			0.810
EPA 300.0 Rev. 2.1	Chloride	105	101	102			0.0275	
	Sulfate	106	103	103			0.196	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	98.2	101				1.48
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	104	105				0.388
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	99.3	99.3				0.0
	NO2NO3-N	99.0	96.2					0.0
EPA 365.1 Rev. 2.0	Total-P	100	101	95.4				5.31
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	96.9	99.1				1.75
SM 2120 B	Color (true)	101					0.748	
SM 2320 B-97	Total Alkalinity	101					0.356	
SM 2540 C-97	TDS						1.51	
SM 4500 F-C-97	Fluoride	97.6	99.0	99.6				0.527
SM 5310 B-00	Organic Carbon	98.5	99.9	100				0.286
	Organic Carbon	101	103	103				0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2077470, 2077471, 2077476
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2077485, 2077486, 2077487
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2077485, 2077486, 2077487
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2077470, 2077471, 2077476
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2077470, 2077471, 2077476
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2077472, 2077473, 2077477
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2077472, 2077473, 2077477
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2077472, 2077473, 2077477

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2077472, 2077473, 2077477
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2077474, 2077475, 2077478
SM 2120 B / E31780	True Color measured at 450 nm	2077470, 2077471, 2077476
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2077470, 2077471, 2077476
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2077470, 2077471, 2077476
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2077470, 2077471, 2077476
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2077470, 2077471, 2077476
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2077472, 2077473, 2077477

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	04/11/2019			04/11/2019 16:15	Adrian Shelby	2077470, 2077471, 2077476
EPA 200.7 Rev. 4.4	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/16/2019 13:52	Betina Topolski	2077485
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/16/2019 14:20	Betina Topolski	2077486
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/16/2019 14:28	Betina Topolski	2077487
EPA 200.8 Rev. 5.4	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/25/2019 00:35	Martin Acosta	2077485
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/25/2019 00:44	Martin Acosta	2077486
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/25/2019 00:54	Martin Acosta	2077487
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/27/2019 03:20	Martin Acosta	2077485
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/27/2019 03:29	Martin Acosta	2077486
	04/11/2019	04/15/2019 16:30	Elliott D. Healy	04/27/2019 03:39	Martin Acosta	2077487
EPA 300.0 Rev. 2.1	04/11/2019			04/17/2019 04:50	Lipi Saha	2077470
	04/11/2019			04/17/2019 05:02	Lipi Saha	2077471
	04/11/2019			04/17/2019 05:14	Lipi Saha	2077476
EPA 350.1 Rev. 2.0	04/11/2019			04/18/2019 10:41	Ping Hua	2077472
	04/11/2019			04/18/2019 10:42	Ping Hua	2077473
	04/11/2019			04/18/2019 10:50	Ping Hua	2077477
EPA 351.2 Rev. 2.0	04/11/2019	04/18/2019 12:15	Adrian Shelby	04/22/2019 12:40	Joseph Suarez	2077472
	04/11/2019	04/18/2019 12:15	Adrian Shelby	04/22/2019 12:45	Joseph Suarez	2077473
	04/11/2019	04/18/2019 12:15	Adrian Shelby	04/22/2019 12:46	Joseph Suarez	2077477
EPA 353.2 Rev. 2.0	04/11/2019			04/19/2019 09:45	Beverly Y. Sanders	2077472
	04/11/2019			04/19/2019 09:46	Beverly Y. Sanders	2077473
	04/11/2019			04/19/2019 09:53	Beverly Y. Sanders	2077477
EPA 365.1 Rev. 2.0	04/11/2019	04/17/2019 12:40	Sima Feizi	04/18/2019 16:54	Rosalyn Ballman	2077472
	04/11/2019	04/17/2019 12:40	Sima Feizi	04/18/2019 16:57	Rosalyn Ballman	2077473
	04/11/2019	04/17/2019 12:40	Sima Feizi	04/18/2019 16:58	Rosalyn Ballman	2077477
EPA 365.1 Rev. 2.0 dissolved	04/11/2019			04/11/2019 15:01	Jhamieka S. Greenwood	2077475
	04/11/2019			04/11/2019 15:49	Jhamieka S. Greenwood	2077474
	04/11/2019			04/11/2019 15:50	Jhamieka S. Greenwood	2077478
SM 2120 B	04/11/2019			04/11/2019 16:12	Mariam Hanna	2077470
	04/11/2019			04/11/2019 16:13	Mariam Hanna	2077471, 2077476
SM 2320 B-97	04/11/2019			04/16/2019 13:05	Samantha Davila	2077470
	04/11/2019			04/16/2019 13:18	Samantha Davila	2077471
	04/11/2019			04/16/2019 13:30	Samantha Davila	2077476
SM 2540 C-97	04/11/2019			04/12/2019 18:11	Mariam Hanna	2077470, 2077471, 2077476
SM 2540 D-97	04/11/2019			04/12/2019 18:23	Mariam Hanna	2077470, 2077471, 2077476
SM 4500 F-C-97	04/11/2019			04/16/2019 13:05	Samantha Davila	2077470
	04/11/2019			04/16/2019 13:18	Samantha Davila	2077471
	04/11/2019			04/16/2019 13:30	Samantha Davila	2077476
SM 5310 B-00	04/11/2019			04/16/2019 17:06	Julia Storbeck	2077473
	04/11/2019			04/16/2019 17:18	Julia Storbeck	2077477

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	04/11/2019			04/17/2019 07:25	Julia Storbeck	2077472