

Chemical Analysis Report

SE-DIST-2021-07-14-01

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

Event Description: **SMP - Okeechobee Monthly 07/20**
Request ID: **RQ-2021-07-12-38**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Colin Wright, Program Administrator

Date Certified: 11-AUG-2021 09:57

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light blue 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 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: Taylor Creek @ 39th St.

Collection Date/Time: 07/13/2021 11:30

Field ID: G1SE0024

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262166	EPA 180.1 Rev. 2.0	Turbidity	4.2	A	NTU	P400988	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P401360	
		Sulfate	12		mg SO4/L	P401363	
	SM 2120 B-2011	Color (true)	380		PCU	P400970	
	SM 2320 B-2011	Total Alkalinity	43		mg CaCO3/L	P401144	
	SM 2540 C-2011	TDS	204		mg/L	P401422	
	SM 2540 D-2011	TSS	6	I	mg/L	P401228	
	SM 4500 F-C-2011	Fluoride	0.076	I	mg F/L	P401147	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P401540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P402131	
2262167	EPA 353.2 Rev. 2.0	NO2NO3-N	0.071		mg N/L	P401149	
	EPA 365.1 Rev. 2.0	Total-P	0.52		mg P/L	P401395	
	SM 5310 B-2011	Organic Carbon	33		mg C/L	P401488	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.44		mg P/L	P400956	
	dissolved						

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lemkin Creek @ 78

Collection Date/Time: 07/13/2021 12:15

Field ID: G1SE0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262169	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P400988	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P401360	
		Sulfate	82		mg SO4/L	P401363	
		Color (true)	140		PCU	P400970	
	SM 2320 B-2011	Total Alkalinity	129		mg CaCO3/L	P401144	
	SM 2540 C-2011	TDS	601		mg/L	P401422	
	SM 2540 D-2011	TSS	4	I	mg/L	P401228	
	SM 4500 F-C-2011	Fluoride	0.14		mg F/L	P401147	
2262170	EPA 350.1 Rev. 2.0	Ammonia-N	0.19		mg N/L	P401540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P402131	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P401149	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P401395	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P401488	
2262171	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.19		mg P/L	P400956	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lettuce Creek @ 710

Collection Date/Time: 07/13/2021 13:05

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262182	EPA 200.7 Rev. 4.4	Barium	17.4		ug/L	P401018	
		Calcium	28.0		mg/L	P401018	
		Iron	1.26E+03		ug/L	P401018	
		Magnesium	13.1		mg/L	P401018	
		Manganese	31.6		ug/L	P401018	
		Potassium	5.6		mg/L	P401018	
		Sodium	90.4		mg/L	P401018	
	EPA 200.8 Rev. 5.4	Zinc	16	I	ug/L	P401018	
		Aluminum	255		ug/L	P401411	
		Antimony	0.13	I	ug/L	P401411	
		Arsenic	2.51		ug/L	P401411	
		Beryllium	0.023	I	ug/L	P401411	
		Boron**	53.8		ug/L	P401411	
		Cadmium	0.020	U	ug/L	P401411	
		Chromium	1.1	I	ug/L	P401411	
		Copper	1.74		ug/L	P401411	
		Lead	0.50		ug/L	P401411	
		Nickel	0.61	I	ug/L	P401411	
		Selenium	0.21	I	ug/L	P401411	
		Silver	0.010	U	ug/L	P401634	
		Thallium	0.10	U	ug/L	P401411	
	SM 2340B	Hardness	124		mg/L	P401018	

Sample Location: FB

Collection Date/Time: 07/13/2021 12:55

Field ID: FB_07132021

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262172	EPA 180.1 Rev. 2.0	Turbidity	0.15		NTU	P400988	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P401360	
		Sulfate	0.20	U	mg SO4/L	P401363	
		Color (true)	2.5	U	PCU	P400970	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P401144	
	SM 2540 C-2011	TDS	15	U	mg/L	P401420	
	SM 2540 D-2011	TSS	2	U	mg/L	P401226	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P401147	
2262173	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P401594	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P402131	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401149	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P401395	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P401488	
2262174	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P400956	
2262183	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P401018	
		Calcium	0.075	U	mg/L	P401018	
		Iron	30	U	ug/L	P401018	
		Magnesium	0.040	U	mg/L	P401018	
		Manganese	1.0	U	ug/L	P401018	
		Potassium	0.30	U	mg/L	P401018	
		Sodium	0.50	U	mg/L	P401018	
		Zinc	5.0	U	ug/L	P401018	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P401411	
		Antimony	0.050	U	ug/L	P401634	
		Arsenic	0.050	U	ug/L	P401411	
		Beryllium	0.010	U	ug/L	P401411	
		Boron**	102		ug/L	P401411	
		Cadmium	0.020	U	ug/L	P401411	
		Chromium	0.40	U	ug/L	P401411	
		Copper	0.40	U	ug/L	P401411	
		Lead	0.20	U	ug/L	P401411	
		Nickel	0.50	U	ug/L	P401411	
		Selenium	0.20	U	ug/L	P401411	
		Silver	0.010	U	ug/L	P401634	
		Thallium	0.10	U	ug/L	P401411	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 07/14/2021.

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The boron result was confirmed in the undigested sample on 07/23/2021.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P400988

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401018

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
Manganese	1.0	U	ug/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: P401411

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401634

Component	Result	Code	Units
Antimony	0.050	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401360

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401363

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401540

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402131

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401149

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401395

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400956

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

Reference Method: SM 2120 B-2011
Batch ID: P400970

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401144

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

Reference Method: SM 2540 C-2011
Batch ID: P401420

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P401422

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401226

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401228

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P401488

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: P401018

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Manganese	102		P	85 - 115
Potassium	101		P	85 - 115
Sodium	106		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	105		P	85 - 115
Antimony	108		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	106		P	85 - 115
Boron	105		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	99.0		P	85 - 115
Lead	102		P	85 - 115
Nickel	102		P	85 - 115
Selenium	102		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	96.5		P	85 - 115
Silver	113		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401360

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401363

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401540

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

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: P402131

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401149

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: P401395

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400956

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

Reference Method: SM 2120 B-2011
Batch ID: P400970

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

Reference Method: SM 2320 B-2011
Batch ID: P401144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P401488

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262059	Barium	106		P	80 - 120
2262059	Calcium	114		P	80 - 120
2262059	Iron	111		P	80 - 120
2262059	Magnesium	115		P	80 - 120
2262059	Manganese	105		P	80 - 120
2262059	Potassium	103		P	80 - 120
2262059	Sodium	108		P	80 - 120
2262059	Zinc	108		P	80 - 120
2262373	Barium	104	108	P/P	80 - 120
2262373	Calcium	109		P	80 - 120
2262373	Iron	108	112	P/P	80 - 120
2262373	Magnesium	107	114	P/P	80 - 120
2262373	Manganese	103	107	P/P	80 - 120
2262373	Potassium	98.9	104	P/P	80 - 120
2262373	Sodium	104		P	80 - 120
2262373	Zinc	107	111	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262058	Aluminum	106		P	80 - 120
2262058	Antimony	113		P	80 - 120
2262058	Arsenic	98.8		P	80 - 120
2262058	Beryllium	107		P	80 - 120
2262058	Boron	109		P	80 - 120
2262058	Cadmium	104		P	80 - 120
2262058	Chromium	102		P	80 - 120
2262058	Copper	95.6		P	80 - 120
2262058	Lead	103		P	80 - 120
2262058	Nickel	96.2		P	80 - 120
2262058	Selenium	101		P	80 - 120
2262058	Thallium	104		P	80 - 120
2262294	Aluminum	102	103	P/P	80 - 120
2262294	Antimony	107	108	P/P	80 - 120
2262294	Arsenic	100	99.4	P/P	80 - 120
2262294	Beryllium	104	106	P/P	80 - 120
2262294	Boron	104	107	P/P	80 - 120
2262294	Cadmium	102	103	P/P	80 - 120
2262294	Chromium	100	101	P/P	80 - 120
2262294	Copper	97.1	94.4	P/P	80 - 120
2262294	Lead	98.0	98.0	P/P	80 - 120
2262294	Nickel	93.0	91.5	P/P	80 - 120
2262294	Selenium	99.5	99.6	P/P	80 - 120
2262294	Thallium	105	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262058	Antimony	94.6	93.2	P/P	80 - 120
2262058	Silver	111	107	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262400	Antimony	96.6		P	80 - 120
2262400	Silver	111		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261754	Chloride	96.3		P	90 - 110
2262166	Chloride	96.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401363

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261754	Sulfate	96.4		P	90 - 110
2262166	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262034	Ammonia-N	99.4	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262354	Ammonia-N	99.0	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262156	NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262156	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262128	O-Phosphate-P	91.3	93.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262394	Fluoride	101	100	P/P	92 - 107

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P401488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262157	Organic Carbon	96.9	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P400988

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262166	Turbidity	3.79	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401018

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262373	Barium	3.67	Spike	P	0 - 20
2262373	Calcium	3.46	Spike	P	0 - 20
2262373	Iron	3.43	Spike	P	0 - 20
2262373	Magnesium	3.82	Spike	P	0 - 20
2262373	Manganese	3.43	Spike	P	0 - 20
2262373	Potassium	2.71	Spike	P	0 - 20
2262373	Sodium	2.39	Spike	P	0 - 20
2262373	Zinc	3.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262294	Aluminum	1.13	Spike	P	0 - 20
2262294	Antimony	0.763	Spike	P	0 - 20
2262294	Arsenic	1.00	Spike	P	0 - 20
2262294	Beryllium	1.60	Spike	P	0 - 20
2262294	Boron	2.01	Spike	P	0 - 20
2262294	Cadmium	1.16	Spike	P	0 - 20
2262294	Chromium	0.783	Spike	P	0 - 20
2262294	Copper	2.68	Spike	P	0 - 20
2262294	Lead	0.00119	Spike	P	0 - 20
2262294	Nickel	1.45	Spike	P	0 - 20
2262294	Selenium	0.119	Spike	P	0 - 20
2262294	Thallium	0.280	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262058	Antimony	1.48	Spike	P	0 - 20
2262058	Silver	4.16	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401360

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261754	Chloride	0.625	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261754	Sulfate	1.52	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262034	Ammonia-N	0.122	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262354	Ammonia-N	2.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P402131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262170	Kjeldahl Nitrogen	2.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P401149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262156	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P401395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262156	Total-P	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P400956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262128	O-Phosphate-P	1.78	Spike	P	0 - 20

Reference Method: SM 2120 B-2011

Batch ID: P400970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262154	Color (true)	1.25	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P401144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Total Alkalinity	0.291	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P401420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262071	TDS	3.64	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P401422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262155	TDS	2.09	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Fluoride	0.457	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P401488

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262157	Organic Carbon	1.58	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A106614

Included Lab Sample IDs: 2262168, 2262171, 2262174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.7	97.3	P/P	90 - 110
O-Phosphate-P	97.9	96.7	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A106621

Included Lab Sample IDs: 2262166, 2262169, 2262172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.9	P/P	90 - 115
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A106624

Included Lab Sample IDs: 2262166, 2262169, 2262172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A106679

Included Lab Sample IDs: 2262166, 2262169, 2262172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.0	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A106679

Included Lab Sample IDs: 2262166, 2262169, 2262172

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106682

Included Lab Sample IDs: 2262167, 2262170, 2262173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A106762

Included Lab Sample IDs: 2262166, 2262169, 2262172

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106786

Included Lab Sample IDs: 2262167, 2262170

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106790

Included Lab Sample IDs: 2262173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A106803

Included Lab Sample IDs: 2262167, 2262170, 2262173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	98.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106806

Included Lab Sample IDs: 2262182, 2262183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Aluminum	102	103	P/P	90 - 110
Arsenic	98.7	98.7	P/P	90 - 110
Arsenic	99.9	99.4	P/P	90 - 110
Beryllium	100	100	P/P	90 - 110
Beryllium	98.7	100	P/P	90 - 110
Boron	100	100	P/P	90 - 110
Boron	101	103	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Chromium	102	99.7	P/P	90 - 110
Copper	94.8	93.9	P/P	90 - 110
Copper	99.1	96.8	P/P	90 - 110
Lead	99.4	99.2	P/P	90 - 110
Lead	99.9	99.6	P/P	90 - 110
Nickel	100	97.7	P/P	90 - 110
Nickel	94.8	94.4	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Thallium	97.7	97.7	P/P	90 - 110
Thallium	98.4	97.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A106828

Included Lab Sample IDs: 2262167, 2262170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106829

Included Lab Sample IDs: 2262182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	108	109	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A106839

Included Lab Sample IDs: 2262182, 2262183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	102	P/P	90 - 110
Barium	99.9	100	P/P	95 - 105
Calcium	101	101	P/P	95 - 105
Calcium	103	103	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Iron	99.4	98.9	P/P	95 - 105
Magnesium	101	100	P/P	90 - 110
Magnesium	99.2	98.8	P/P	95 - 105
Manganese	101	101	P/P	95 - 105
Manganese	103	102	P/P	90 - 110
Potassium	98.6	98.9	P/P	90 - 110
Potassium	99.1	101	P/P	95 - 105
Sodium	100	101	P/P	95 - 105
Sodium	99.8	99.6	P/P	90 - 110
Zinc	100	101	P/P	95 - 105
Zinc	106	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A106850

Included Lab Sample IDs: 2262173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106941

Included Lab Sample IDs: 2262182, 2262183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	105	105	P/P	90 - 110
Silver	97.9	98.8	P/P	90 - 110
Silver	99.3	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107126

Included Lab Sample IDs: 2262167, 2262170, 2262173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	101	P/P	90 - 110
Kjeldahl Nitrogen	101	98.9	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					3.79	
EPA 200.7 Rev. 4.4	Barium	102	106	104	108		3.67
	Calcium	107	114	109			3.46
	Iron	106	111	108	112		3.43
	Magnesium	109	115	107	114		3.82
	Manganese	102	105	103	107		3.43
	Potassium	101	103	98.9	104		2.71
	Sodium	106	108	104			2.39
	Zinc	99.6	108	107	111		3.49
EPA 200.8 Rev. 5.4	Aluminum	105	102	103	106		1.13
	Antimony	108	107	108	113		0.763
	Antimony	96.5	94.6	93.2	96.6		1.48
	Arsenic	102	98.8	100	99.4		1.00
	Beryllium	106	104	106	107		1.60
	Boron	105	104	107	109		2.01
	Cadmium	101	102	103	104		1.16
	Chromium	101	100	101	102		0.783
	Copper	99.0	97.1	94.4	95.6		2.68
	Lead	102	98.0	98.0	103		0.0011
	Nickel	102	93.0	91.5	96.2		1.45
	Selenium	102	99.5	99.6	101		0.119
	Silver	113	111	107	111		4.16
	Thallium	103	105	105	104		0.280
EPA 300.0 Rev. 2.1	Chloride	100	96.3	96.4		0.625	
	Sulfate	100	96.4	99.1		1.52	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.4	99.6			0.122
	Ammonia-N	101	99.0	96.0			2.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106					2.34
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.0	98.0			0.0
EPA 365.1 Rev. 2.0	Total-P	105	103	104			0.504
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	91.3	93.1			1.78
SM 2120 B-2011	Color (true)	102				1.25	
SM 2320 B-2011	Total Alkalinity	101				0.291	
SM 2540 C-2011	TDS					3.64	
	TDS					2.09	
SM 4500 F-C-2011	Fluoride	99.5	101	100			0.457
SM 5310 B-2011	Organic Carbon	96.0	96.9	99.2			1.58

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2262166, 2262169, 2262172
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2262182, 2262183
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2262182, 2262183
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2262166, 2262169, 2262172
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2262166, 2262169, 2262172
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2262167, 2262170, 2262173
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2262167, 2262170, 2262173
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2262167, 2262170, 2262173
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2262167, 2262170, 2262173

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2262168, 2262171, 2262174
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2262166, 2262169, 2262172
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2262166, 2262169, 2262172
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2262182
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2262166, 2262169, 2262172
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2262166, 2262169, 2262172
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2262166, 2262169, 2262172
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2262167, 2262170, 2262173

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	07/14/2021			07/14/2021 16:49	Sarah A Nixon	2262166, 2262169, 2262172
EPA 200.7 Rev. 4.4	07/14/2021	07/15/2021 14:55	Elliott D. Healy	07/26/2021 12:47	Josef B Mick	2262183
	07/14/2021	07/15/2021 14:55	Elliott D. Healy	07/26/2021 15:43	Josef B Mick	2262182
EPA 200.8 Rev. 5.4	07/14/2021	07/22/2021 15:25	Elliott D. Healy	07/23/2021 17:14	Alexander Thompson	2262183
	07/14/2021	07/22/2021 15:25	Elliott D. Healy	07/23/2021 21:12	Alexander Thompson	2262182
	07/14/2021	07/22/2021 15:25	Elliott D. Healy	07/26/2021 15:43	Alexander Thompson	2262182
	07/14/2021	07/28/2021 12:45	Elliott D. Healy	07/29/2021 17:18	McKinley C Carter	2262183
	07/14/2021	07/28/2021 12:45	Elliott D. Healy	07/29/2021 19:55	McKinley C Carter	2262182
EPA 300.0 Rev. 2.1	07/14/2021			07/20/2021 19:24	Lipi Saha	2262166
	07/14/2021			07/20/2021 23:14	Lipi Saha	2262169
	07/14/2021			07/20/2021 23:26	Lipi Saha	2262172
EPA 350.1 Rev. 2.0	07/14/2021			07/26/2021 13:28	Roberta Tatti	2262167
	07/14/2021			07/26/2021 13:29	Roberta Tatti	2262170
	07/14/2021			07/27/2021 12:30	Roberta Tatti	2262173
EPA 351.2 Rev. 2.0	07/14/2021	08/06/2021 13:37	Benjamin T. Nordmann	08/09/2021 15:24	Virginia P. Brown	2262167
	07/14/2021	08/06/2021 13:37	Benjamin T. Nordmann	08/09/2021 15:25	Virginia P. Brown	2262170
	07/14/2021	08/06/2021 13:37	Benjamin T. Nordmann	08/09/2021 15:34	Virginia P. Brown	2262173
EPA 353.2 Rev. 2.0	07/14/2021			07/19/2021 09:30	Beverly Y. Sanders	2262167
	07/14/2021			07/19/2021 09:31	Beverly Y. Sanders	2262170
	07/14/2021			07/19/2021 09:32	Beverly Y. Sanders	2262173
EPA 365.1 Rev. 2.0	07/14/2021	07/22/2021 12:02	Shengyu Ding	07/23/2021 08:24	Shengyu Ding	2262167
	07/14/2021	07/22/2021 12:02	Shengyu Ding	07/23/2021 08:25	Shengyu Ding	2262170
	07/14/2021	07/22/2021 12:02	Shengyu Ding	07/23/2021 09:57	Shengyu Ding	2262173
EPA 365.1 Rev. 2.0 dissolved	07/14/2021			07/14/2021 15:49	Ping Hua	2262168
	07/14/2021			07/14/2021 15:53	Ping Hua	2262174
	07/14/2021			07/14/2021 16:03	Ping Hua	2262171
SM 2120 B-2011	07/14/2021			07/14/2021 17:56	Sarah A Nixon	2262169, 2262172
	07/14/2021			07/14/2021 18:14	Sarah A Nixon	2262166
SM 2320 B-2011	07/14/2021			07/17/2021 05:11	Dale L. Simmons	2262166
	07/14/2021			07/17/2021 05:26	Dale L. Simmons	2262169
	07/14/2021			07/17/2021 05:35	Dale L. Simmons	2262172
SM 2340B	07/14/2021			07/26/2021 15:43	Josef B Mick	2262182
SM 2540 C-2011	07/14/2021			07/16/2021 14:42	Yijie Li	2262166, 2262169, 2262172
SM 2540 D-2011	07/14/2021			07/16/2021 14:42	Yijie Li	2262166, 2262169, 2262172
SM 4500 F-C-2011	07/14/2021			07/17/2021 05:11	Dale L. Simmons	2262166
	07/14/2021			07/17/2021 05:26	Dale L. Simmons	2262169
	07/14/2021			07/17/2021 05:35	Dale L. Simmons	2262172
SM 5310 B-2011	07/14/2021			07/22/2021 05:59	Madeline Gruver	2262167
	07/14/2021			07/22/2021 06:12	Madeline Gruver	2262170
	07/14/2021			07/22/2021 06:27	Madeline Gruver	2262173