

Chemical Analysis Report

NW-DIST-2021-11-03-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

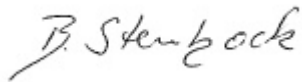
Event Description: **Bay Walton County Run**
Request ID: **RQ-2021-09-06-36**
Customer: **NW-DIST**
Project ID: **SMP**

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Date Certified: 19-NOV-2021 18:56



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: Gum Creek downstream of Bess Nook Rd

Collection Date/Time: 11/01/2021 11:30

Field ID: G3NW0452

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2287600	EPA 180.1 Rev. 2.0	Turbidity	2.8	A	NTU	P405973	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P406110	
		Sulfate	0.21	I	mg SO4/L	P406112	
	SM 2120 B-2011	Color (true)	150	A	PCU	P405914	
	SM 2320 B-2011	Total Alkalinity	1.2	I	mg CaCO3/L	P406171	
	SM 2540 C-2011	TDS	21	I	mg/L	P406360	
	SM 2540 D-2011	TSS	2	I	mg/L	P406375	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P406175	
2287601	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P406398	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P406121	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P406052	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P406046	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P406094	
2287602	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P405921	
2287617	EPA 200.7 Rev. 4.4	Barium	8.6		ug/L	P406043	
		Calcium	1.46		mg/L	P406043	
		Iron	1.06E+03		ug/L	P406043	
		Magnesium	0.82		mg/L	P406043	
		Manganese	57.6		ug/L	P406043	
		Potassium	0.49	I	mg/L	P406043	
		Sodium	1.5	I	mg/L	P406043	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P406043	
		Aluminum	315		ug/L	P406043	
		Antimony	0.050	U	ug/L	P406043	
		Arsenic	0.39		ug/L	P406043	
		Beryllium	0.010	U	ug/L	P406043	
		Boron**	13.1		ug/L	P406043	
		Cadmium	0.020	U	ug/L	P406043	
		Chromium	0.40	U	ug/L	P406043	
		Copper	0.40	U	ug/L	P406043	
		Lead	0.50		ug/L	P406043	
		Nickel	0.50	U	ug/L	P406043	
		Selenium	0.20	U	ug/L	P406043	
		Silver	0.010	U	ug/L	P406043	
		Thallium	0.10	U	ug/L	P406043	
		Hardness	7.0		mg/L	P406043	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable because of high analyte concentration in the QC sample.

Sample Location: Sikes Creek upstream of Bonifay Gritney Rd

Collection Date/Time: 11/01/2021 10:35

Field ID: G3NW0159

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2287604	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P406398	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P406121	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P406052	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P406046	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P406094	
2287605	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P405921	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Sample Location: Lafayette Creek

Collection Date/Time: 11/01/2021 13:50

Field ID: G3NW0455

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2287618	EPA 200.7 Rev. 4.4	Barium	6.0		ug/L	P406043	
		Calcium	1.46		mg/L	P406043	
		Iron	200		ug/L	P406043	
		Magnesium	0.50		mg/L	P406043	
		Manganese	5.4		ug/L	P406043	
		Potassium	0.52	I	mg/L	P406043	
		Sodium	3.0		mg/L	P406043	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P406043	
		Aluminum	151		ug/L	P406043	
		Antimony	0.050	U	ug/L	P406043	
		Arsenic	0.18	I	ug/L	P406043	
		Beryllium	0.013	I	ug/L	P406043	
		Boron**	10.9		ug/L	P406043	
		Cadmium	0.020	U	ug/L	P406043	
		Chromium	0.40	U	ug/L	P406043	
		Copper	0.40	U	ug/L	P406043	
		Lead	0.20	U	ug/L	P406043	
		Nickel	0.50	U	ug/L	P406043	
		Selenium	0.20	U	ug/L	P406043	
		Silver	0.010	U	ug/L	P406043	
		Thallium	0.10	U	ug/L	P406043	
	SM 2340B	Hardness	5.7		mg/L	P406043	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable because of high analyte concentration in the QC sample.

Sample Location: FB

Collection Date/Time: 11/01/2021 13:10

Field ID: FB_11012021

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2287606	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P405973	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P406110	
		Sulfate	0.20	U	mg SO4/L	P406112	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P405914	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P406171	
	SM 2540 C-2011	TDS	15	U	mg/L	P406359	
	SM 2540 D-2011	TSS	2	U	mg/L	P406374	
2287607	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P406175	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P406398	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P406121	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P406052	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P406046	
2287608	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P406094	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405921	
2287619	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P406043	
		Calcium	0.075	U	mg/L	P406043	
		Iron	30	U	ug/L	P406043	
		Magnesium	0.040	U	mg/L	P406043	
		Manganese	1.0	U	ug/L	P406043	
		Potassium	0.30	U	mg/L	P406043	
		Sodium	0.5	U	mg/L	P406043	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P406043	
		Aluminum	5.0	U	ug/L	P406043	
		Antimony	0.050	U	ug/L	P406043	
		Arsenic	0.050	U	ug/L	P406043	
		Beryllium	0.010	U	ug/L	P406043	
		Boron**	2.0	U	ug/L	P406043	
		Cadmium	0.020	U	ug/L	P406043	
		Chromium	0.40	U	ug/L	P406043	
		Copper	0.40	U	ug/L	P406043	
		Lead	0.20	U	ug/L	P406043	
		Nickel	0.50	U	ug/L	P406043	
		Selenium	0.20	U	ug/L	P406043	
		Silver	0.010	U	ug/L	P406043	
		Thallium	0.10	U	ug/L	P406043	
		Hardness	0.35	U	mg/L	P406043	

Ref. Method and Comment:

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

EPA 353.2 Rev. 2.0: The result was confirmed on 11/05/2021.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405973

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406043

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: P406043

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
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406110

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406112

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406398

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: P406121

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406052

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406046

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405921

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

Reference Method: SM 2120 B-2011
Batch ID: P405914

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P406171

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

Reference Method: SM 2540 C-2011
Batch ID: P406359

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P406360

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P406374

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P406375

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P406175

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P406094

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: P406043

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.5		P	85 - 115
Calcium	109		P	85 - 115
Iron	109		P	85 - 115
Magnesium	112		P	85 - 115
Manganese	103		P	85 - 115
Potassium	104		P	85 - 115
Sodium	112		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406043

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	103		P	85 - 115
Beryllium	100		P	85 - 115
Boron	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	101		P	85 - 115
Nickel	102		P	85 - 115
Selenium	103		P	85 - 115
Silver	104		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406110

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406112

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406398

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406121

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406052

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: P406046

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405921

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

Reference Method: SM 2120 B-2011
Batch ID: P405914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P406171

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P406175

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P406094

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P406043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287488	Barium	99.5		P	80 - 120
2287488	Iron	110		P	80 - 120
2287488	Magnesium	116		P	80 - 120
2287488	Manganese	102		P	80 - 120
2287488	Potassium	108		P	80 - 120
2287488	Sodium	107		P	80 - 120
2287488	Zinc	104		P	80 - 120
2288332	Barium	103	102	P/P	80 - 120
2288332	Iron	117		P	80 - 120
2288332	Magnesium	120	115	P/P	80 - 120
2288332	Manganese	108	107	P/P	80 - 120
2288332	Potassium	117	114	P/P	80 - 120
2288332	Sodium	119	114	P/P	80 - 120
2288332	Zinc	110	110	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P406043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287488	Aluminum	103		P	80 - 120
2287488	Antimony	109		P	80 - 120
2287488	Arsenic	103		P	80 - 120
2287488	Beryllium	102		P	80 - 120
2287488	Boron	102		P	80 - 120
2287488	Cadmium	104		P	80 - 120
2287488	Chromium	105		P	80 - 120
2287488	Copper	102		P	80 - 120
2287488	Lead	103		P	80 - 120
2287488	Nickel	102		P	80 - 120
2287488	Selenium	103		P	80 - 120
2287488	Silver	103		P	80 - 120
2287488	Thallium	107		P	80 - 120
2288332	Aluminum	103	99.3	P/P	80 - 120
2288332	Antimony	109	104	P/P	80 - 120
2288332	Arsenic	103	99.4	P/P	80 - 120
2288332	Beryllium	101	97.7	P/P	80 - 120
2288332	Boron	100	97.8	P/P	80 - 120
2288332	Cadmium	102	99.2	P/P	80 - 120
2288332	Chromium	104	100	P/P	80 - 120
2288332	Copper	101	96.8	P/P	80 - 120
2288332	Lead	101	97.5	P/P	80 - 120
2288332	Nickel	105	102	P/P	80 - 120
2288332	Selenium	103	99.4	P/P	80 - 120
2288332	Silver	105	105	P/P	80 - 120
2288332	Thallium	106	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406110

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287475	Chloride	98.2		P	90 - 110
2287920	Chloride	97.1		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287475	Sulfate	97.4		P	90 - 110
2287920	Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287180	Ammonia-N	96.8	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286698	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287476	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287477	Total-P	102	95.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287602	O-Phosphate-P	94.3	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P406175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287650	Fluoride	102	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P406094

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287601	Organic Carbon	93.6	91.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P405973

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287600	Turbidity	5.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P406043

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288332	Barium	0.986	Spike	P	0 - 20
2288332	Calcium	3.75	Spike	P	0 - 20
2288332	Iron	3.91	Spike	P	0 - 20
2288332	Magnesium	3.02	Spike	P	0 - 20
2288332	Manganese	0.788	Spike	P	0 - 20
2288332	Potassium	2.29	Spike	P	0 - 20
2288332	Sodium	2.60	Spike	P	0 - 20
2288332	Zinc	0.0220	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P406043

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288332	Aluminum	3.76	Spike	P	0 - 20
2288332	Antimony	4.02	Spike	P	0 - 20
2288332	Arsenic	1.82	Spike	P	0 - 20
2288332	Beryllium	2.84	Spike	P	0 - 20
2288332	Boron	2.01	Spike	P	0 - 20
2288332	Cadmium	2.68	Spike	P	0 - 20
2288332	Chromium	3.52	Spike	P	0 - 20
2288332	Copper	3.10	Spike	P	0 - 20
2288332	Lead	3.65	Spike	P	0 - 20
2288332	Nickel	3.11	Spike	P	0 - 20
2288332	Selenium	3.38	Spike	P	0 - 20
2288332	Silver	0.285	Spike	P	0 - 20
2288332	Thallium	2.76	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406110

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287475	Chloride	0.810	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406112

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287475	Sulfate	0.570	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406398

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287180	Ammonia-N	1.16	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406121

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286698	Kjeldahl Nitrogen	0.413	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P406052

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287476	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406046

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287477	Total-P	2.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P405921

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287602	O-Phosphate-P	1.41	Spike	P	0 - 20

Reference Method: SM 2120 B-2011

Batch ID: P405914

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287600	Color (true)	0.0545	Sample	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P406171

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287650	Total Alkalinity	1.33	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011

Batch ID: P406359

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287891	TDS	8.08	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P406360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287139	TDS	4.47	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P406175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287650	Fluoride	0.473	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P406094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287601	Organic Carbon	1.18	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A106110

Included Lab Sample IDs: 2287600, 2287606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Sulfate	98.7	101	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A108681

Included Lab Sample IDs: 2287600, 2287606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108682

Included Lab Sample IDs: 2287602, 2287605, 2287608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108699

Included Lab Sample IDs: 2287600, 2287606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108740

Included Lab Sample IDs: 2287601, 2287604, 2287607

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

Reference Method: SM 5310 B-2011

Run ID: A108767

Included Lab Sample IDs: 2287601, 2287604, 2287607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.9	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A108794

Included Lab Sample IDs: 2287600, 2287606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.1	99.6	P/P	90 - 110
Total Alkalinity	99.6	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A108794

Included Lab Sample IDs: 2287600, 2287606

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

Reference Method: SM 4500 F-C-2011

Run ID: A108794

Included Lab Sample IDs: 2287600, 2287606

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108800

Included Lab Sample IDs: 2287601, 2287604, 2287607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	106	P/P	90 - 110
Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108810

Included Lab Sample IDs: 2287617, 2287618, 2287619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.8	101	P/P	90 - 110
Barium	98.8	98.8	P/P	90 - 110
Calcium	103	107	P/P	90 - 110
Calcium	107	108	P/P	90 - 110
Iron	104	108	P/P	90 - 110
Iron	108	110	P/P	90 - 110
Magnesium	103	107	P/P	90 - 110
Magnesium	107	109	P/P	90 - 110
Manganese	102	105	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Potassium	102	104	P/P	90 - 110
Potassium	99.1	102	P/P	90 - 110
Zinc	103	106	P/P	90 - 110
Zinc	106	107	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108860

Included Lab Sample IDs: 2287617, 2287618, 2287619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	103	P/P	90 - 110
Aluminum	101	100	P/P	90 - 110
Aluminum	103	101	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Antimony	99.4	101	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Beryllium	96.4	99.3	P/P	90 - 110
Beryllium	97.4	98.4	P/P	90 - 110
Beryllium	99.3	97.4	P/P	90 - 110
Boron	102	103	P/P	90 - 110
Boron	102	102	P/P	90 - 110
Boron	103	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108860

Included Lab Sample IDs: 2287617, 2287618, 2287619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	98.3	99.5	P/P	90 - 110
Cadmium	99.5	99.8	P/P	90 - 110
Cadmium	99.8	99.3	P/P	90 - 110
Chromium	96.6	96.9	P/P	90 - 110
Chromium	96.9	98.3	P/P	90 - 110
Chromium	98.3	98.4	P/P	90 - 110
Copper	98.7	99.1	P/P	90 - 110
Copper	99.1	99.4	P/P	90 - 110
Copper	99.6	98.7	P/P	90 - 110
Lead	96.7	99.2	P/P	90 - 110
Lead	97.5	96.7	P/P	90 - 110
Lead	99.2	97.0	P/P	90 - 110
Nickel	98.7	99.1	P/P	90 - 110
Nickel	99.1	99.4	P/P	90 - 110
Nickel	99.3	98.7	P/P	90 - 110
Selenium	100	101	P/P	90 - 110
Selenium	101	103	P/P	90 - 110
Selenium	103	102	P/P	90 - 110
Silver	93.4	93.8	P/P	90 - 110
Silver	93.8	94.2	P/P	90 - 110
Silver	94.2	93.9	P/P	90 - 110
Thallium	101	97.7	P/P	90 - 110
Thallium	98.5	101	P/P	90 - 110
Thallium	99.2	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108867

Included Lab Sample IDs: 2287617, 2287618, 2287619

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108896

Included Lab Sample IDs: 2287601, 2287604, 2287607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108931

Included Lab Sample IDs: 2287601, 2287604, 2287607

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.4	96.4	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					5.82	
EPA 200.7 Rev. 4.4	Barium	99.5	99.5	103	102		0.986
	Calcium	109					3.75
	Iron	109	110	117			3.91
	Magnesium	112	116	120	115		3.02
	Manganese	103	102	108	107		0.788
	Potassium	104	108	117	114		2.29
	Sodium	112	107	119	114		2.60
	Zinc	107	104	110	110		0.0220
EPA 200.8 Rev. 5.4	Aluminum	103	103	99.3	103		3.76
	Antimony	105	109	104	109		4.02
	Arsenic	103	103	99.4	103		1.82
	Beryllium	100	101	97.7	102		2.84
	Boron	101	100	97.8	102		2.01
	Cadmium	100	102	99.2	104		2.68
	Chromium	101	104	100	105		3.52
	Copper	102	101	96.8	102		3.10
	Lead	101	101	97.5	103		3.65
	Nickel	102	105	102	102		3.11
	Selenium	103	103	99.4	103		3.38
	Silver	104	105	103	105		0.285
	Thallium	106	106	103	107		2.76
EPA 300.0 Rev. 2.1	Chloride	98.1	98.2	97.1		0.810	
	Sulfate	96.8	97.4	98.6		0.570	
EPA 350.1 Rev. 2.0	Ammonia-N	94.2	96.8	98.6			1.16
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	101	102			0.413
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	103	102	95.3			2.13
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	94.3	95.7			1.41
SM 2120 B-2011	Color (true)	99.8				0.0545	
SM 2320 B-2011	Total Alkalinity	99.5				1.33	
SM 2540 C-2011	TDS					8.08	
	TDS					4.47	
SM 4500 F-C-2011	Fluoride	102	102	101			0.473
SM 5310 B-2011	Organic Carbon	95.4	93.6	91.6			1.18

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2287600, 2287606
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2287617, 2287618, 2287619
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2287617, 2287618, 2287619
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2287600, 2287606
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2287600, 2287606
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2287601, 2287604, 2287607
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2287601, 2287604, 2287607
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2287601, 2287604, 2287607
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2287601, 2287604, 2287607
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2287602, 2287605, 2287608
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2287600, 2287606

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2287600, 2287606
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2287617, 2287618, 2287619
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2287600, 2287606
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2287600, 2287606
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2287600, 2287606
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2287601, 2287604, 2287607

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	11/03/2021			11/03/2021 11:01	Khloe J Berg	2287600
	11/03/2021			11/03/2021 11:03	Khloe J Berg	2287606
EPA 200.7 Rev. 4.4	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/09/2021 14:42	Josef B Mick	2287619
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/09/2021 16:24	Josef B Mick	2287617
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/09/2021 16:30	Josef B Mick	2287618
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 18:12	Josef B Mick	2287619
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 18:23	Josef B Mick	2287617
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 18:29	Josef B Mick	2287618
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 20:08	McKinley C Carter	2287619
EPA 200.8 Rev. 5.4	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 23:00	McKinley C Carter	2287617
	11/03/2021	11/05/2021 11:20	Emily M Philpot	11/10/2021 23:54	McKinley C Carter	2287618
EPA 300.0 Rev. 2.1	11/03/2021			11/05/2021 17:52	Roberta Tatti	2287600
	11/03/2021			11/05/2021 18:05	Roberta Tatti	2287606
EPA 350.1 Rev. 2.0	11/03/2021			11/16/2021 13:26	Ping Hua	2287601
	11/03/2021			11/16/2021 13:27	Ping Hua	2287604
	11/03/2021			11/16/2021 13:28	Ping Hua	2287607
EPA 351.2 Rev. 2.0	11/03/2021	11/08/2021 13:15	Benjamin T. Nordmann	11/09/2021 10:39	Alexandra J Mattheus	2287601
	11/03/2021	11/08/2021 13:15	Benjamin T. Nordmann	11/09/2021 10:40	Alexandra J Mattheus	2287604
	11/03/2021	11/08/2021 13:15	Benjamin T. Nordmann	11/09/2021 10:45	Alexandra J Mattheus	2287607
EPA 353.2 Rev. 2.0	11/03/2021			11/05/2021 10:42	Beverly Y. Sanders	2287601
	11/03/2021			11/05/2021 10:43	Beverly Y. Sanders	2287604
	11/03/2021			11/05/2021 10:44	Beverly Y. Sanders	2287607
EPA 365.1 Rev. 2.0	11/03/2021	11/05/2021 18:39	Madeline Gruver	11/10/2021 17:08	Sarah A Nixon	2287607
	11/03/2021	11/05/2021 18:39	Madeline Gruver	11/10/2021 17:10	Sarah A Nixon	2287601
	11/03/2021	11/05/2021 18:39	Madeline Gruver	11/10/2021 17:11	Sarah A Nixon	2287604
EPA 365.1 Rev. 2.0 dissolved	11/03/2021			11/03/2021 11:08	James L Waggeberby	2287602
	11/03/2021			11/03/2021 11:11	James L Waggeberby	2287605
	11/03/2021			11/03/2021 11:12	James L Waggeberby	2287608
SM 2120 B-2011	11/03/2021			11/03/2021 11:23	Benjamin T. Nordmann	2287606
	11/03/2021			11/03/2021 11:24	Benjamin T. Nordmann	2287600
SM 2320 B-2011	11/03/2021			11/05/2021 20:20	Dale L. Simmons	2287600
	11/03/2021			11/05/2021 21:02	Dale L. Simmons	2287606
SM 2340B	11/03/2021			11/09/2021 14:42	Josef B Mick	2287619
	11/03/2021			11/09/2021 16:24	Josef B Mick	2287617
	11/03/2021			11/09/2021 16:30	Josef B Mick	2287618
SM 2540 C-2011	11/03/2021			11/05/2021 15:08	Yijie Li	2287600, 2287606
SM 2540 D-2011	11/03/2021			11/05/2021 15:35	Yijie Li	2287600, 2287606
SM 4500 F-C-2011	11/03/2021			11/05/2021 20:20	Dale L. Simmons	2287600
	11/03/2021			11/05/2021 21:02	Dale L. Simmons	2287606
SM 5310 B-2011	11/03/2021			11/05/2021 14:43	Khloe J Berg	2287601

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	11/03/2021			11/05/2021 16:01	Khloe J Berg	2287604
	11/03/2021			11/05/2021 16:14	Khloe J Berg	2287607