Chemical Analysis Report

NE-DIST-2021-09-02-01

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

Event Description: **Nassau West 2**
Request ID: **RQ-2021-08-09-25**
Customer: **NE-DIST**
Project ID: **SMP**

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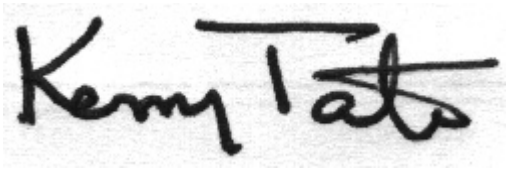
Date Certified: 27-SEP-2021 11:28



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: South Prong St.Marys at Richardson Rd **Collection Date/Time: 09/01/2021 12:15**

Field ID: G4NE0307 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2273295	EPA 200.7 Rev. 4.4	Barium	16.8		ug/L	P403326	
		Calcium	1.91		mg/L	P403326	
		Iron	1.94E+03		ug/L	P403326	
		Magnesium	0.92		mg/L	P403326	
		Manganese	22.4		ug/L	P403326	
		Potassium	0.30	U	mg/L	P403326	
		Sodium	3.6		mg/L	P403326	
		Zinc	5.0	U	ug/L	P403326	
	EPA 200.8 Rev. 5.4	Aluminum	797		ug/L	P403326	
		Antimony	0.050	U	ug/L	P403326	
		Arsenic	0.47		ug/L	P403326	
		Beryllium	0.039	I	ug/L	P403326	
		Boron**	16.9		ug/L	P403326	
		Cadmium	0.020	U	ug/L	P403326	
		Chromium	0.80	I	ug/L	P403326	
		Copper	0.40	U	ug/L	P403326	
		Lead	0.77		ug/L	P403326	
		Nickel	0.89	I	ug/L	P403326	
		Selenium	0.20	U	ug/L	P403326	
		Silver	0.010	U	ug/L	P403326	
		Thallium	0.10	U	ug/L	P403326	
	SM 2340B	Hardness	8.5		mg/L	P403326	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/09/2021.

Sample Location: ST MARYS S PRONG @ US 90 **Collection Date/Time: 09/01/2021 14:50**

Field ID: 19010021 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2273276	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P403333	
	EPA 300.0 Rev. 2.1	Chloride	7.1		mg Cl/L	P403499	
		Sulfate	0.75		mg SO4/L	P403500	
	SM 2120 B-2011	Color (true)	510		PCU	P403335	
	SM 2320 B-2011	Total Alkalinity	2.2	I	mg CaCO3/L	P403437	
	SM 2540 C-2011	TDS	89		mg/L	P403573	
	SM 2540 D-2011	TSS	4	I	mg/L	P403569	
	SM 4500 F-C-2011	Fluoride	0.042	I	mg F/L	P403438	
2273277	EPA 350.1 Rev. 2.0	Ammonia-N	0.062		mg N/L	P403421	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P403449	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.094		mg N/L	P403349	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P403427	
	SM 5310 B-2011	Organic Carbon	39		mg C/L	P403549	
2273278	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.058		mg P/L	P403337	
2273293	EPA 200.7 Rev. 4.4	Barium	20.5		ug/L	P403326	
		Calcium	4.20		mg/L	P403326	
		Iron	2.03E+03		ug/L	P403326	
		Magnesium	1.33		mg/L	P403326	
		Potassium	0.71	I	mg/L	P403326	
		Sodium	4.4		mg/L	P403326	
		Zinc	7.3	I	ug/L	P403326	
	EPA 200.8 Rev. 5.4	Aluminum	854		ug/L	P403326	
		Antimony	0.050	U	ug/L	P403326	
		Arsenic	0.65		ug/L	P403326	
		Boron**	19.1		ug/L	P403326	
		Cadmium	0.020	U	ug/L	P403326	
		Chromium	0.99	I	ug/L	P403326	
		Copper	0.67	I	ug/L	P403326	
		Lead	1.02		ug/L	P403326	
		Nickel	0.95	I	ug/L	P403326	
		Selenium	0.20	U	ug/L	P403326	
		Silver	0.010	U	ug/L	P403326	
		Thallium	0.10	U	ug/L	P403326	
	SM 2340B	Hardness	16.0		mg/L	P403326	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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 and relative percent difference are unavailable because of analytical difficulties.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/09/2021.

Sample Location: DEEP CR @ US 90 **Collection Date/Time: 09/01/2021 15:30**

Field ID: 19010085 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2273279	EPA 180.1 Rev. 2.0	Turbidity	6.5		NTU	P403333	
	EPA 300.0 Rev. 2.1	Chloride	7.6		mg Cl/L	P403499	
		Sulfate	2.4		mg SO4/L	P403500	
	SM 2120 B-2011	Color (true)	490		PCU	P403335	
	SM 2320 B-2011	Total Alkalinity	12		mg CaCO3/L	P403437	
	SM 2540 C-2011	TDS	105		mg/L	P403573	
	SM 2540 D-2011	TSS	5	I	mg/L	P403569	
	SM 4500 F-C-2011	Fluoride	0.049	I	mg F/L	P403438	
2273280	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P403421	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P403449	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.069		mg N/L	P403349	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P403427	
	SM 5310 B-2011	Organic Carbon	35		mg C/L	P403549	
2273281	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P403337	
2273294	EPA 200.7 Rev. 4.4	Barium	16.8		ug/L	P403326	
		Calcium	8.14		mg/L	P403326	
		Iron	2.03E+03		ug/L	P403326	
		Magnesium	1.67		mg/L	P403326	
		Potassium	1.1	I	mg/L	P403326	
		Sodium	5.7		mg/L	P403326	
		Zinc	13	I	ug/L	P403326	
	EPA 200.8 Rev. 5.4	Aluminum	588		ug/L	P403326	
		Antimony	0.096	I	ug/L	P403326	
		Arsenic	0.73		ug/L	P403326	
		Boron**	30.9		ug/L	P403326	
		Cadmium	0.020	U	ug/L	P403326	
		Chromium	1.4	I	ug/L	P403326	
		Copper	2.56		ug/L	P403326	
		Lead	1.06		ug/L	P403326	
		Nickel	1.0	I	ug/L	P403326	
		Selenium	0.20	I	ug/L	P403326	
		Silver	0.010	U	ug/L	P403326	
		Thallium	0.10	U	ug/L	P403326	
	SM 2340B	Hardness	27.2		mg/L	P403326	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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 and relative percent difference are unavailable because of analytical difficulties.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/09/2021.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P403333

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403326

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: P403326

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: P403499

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403500

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403421

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: P403449

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403349

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403427

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403337

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

Reference Method: SM 2120 B-2011
Batch ID: P403335

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P403437

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

Reference Method: SM 2540 C-2011
Batch ID: P403573

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P403569

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P403438

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P403549

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: P403326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	102		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Manganese	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	99.4		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	99.0		P	85 - 115
Beryllium	100		P	85 - 115
Boron	95.1		P	85 - 115
Cadmium	96.0		P	85 - 115
Chromium	101		P	85 - 115
Copper	101		P	85 - 115
Lead	103		P	85 - 115
Nickel	99.9		P	85 - 115
Selenium	99.4		P	85 - 115
Silver	110		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403499

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403500

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403421

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403449

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403427

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: P403337

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

Reference Method: SM 2120 B-2011
Batch ID: P403335

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P403437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P403438

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

Reference Method: SM 5310 B-2011
Batch ID: P403549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273156	Barium	104	102	P/P	80 - 120
2273156	Calcium	104		P	80 - 120
2273156	Iron	111	107	P/P	80 - 120
2273156	Magnesium	112	108	P/P	80 - 120
2273156	Manganese	105	101	P/P	80 - 120
2273156	Potassium	105	101	P/P	80 - 120
2273156	Sodium	107	105	P/P	80 - 120
2273156	Zinc	105	104	P/P	80 - 120
2273239	Barium	104		P	80 - 120
2273239	Calcium	107		P	80 - 120
2273239	Iron	109		P	80 - 120
2273239	Magnesium	109		P	80 - 120
2273239	Manganese	105		P	80 - 120
2273239	Potassium	101		P	80 - 120
2273239	Sodium	103		P	80 - 120
2273239	Zinc	113		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273156	Aluminum	100	97.1	P/P	80 - 120
2273156	Antimony	105	102	P/P	80 - 120
2273156	Arsenic	99.0	96.1	P/P	80 - 120
2273156	Beryllium	101	97.3	P/P	80 - 120
2273156	Boron	97.5	95.8	P/P	80 - 120
2273156	Cadmium	98.5	96.1	P/P	80 - 120
2273156	Chromium	104	99.8	P/P	80 - 120
2273156	Copper	100	95.6	P/P	80 - 120
2273156	Lead	104	101	P/P	80 - 120
2273156	Nickel	99.9	95.3	P/P	80 - 120
2273156	Selenium	98.1	95.6	P/P	80 - 120
2273156	Silver	108	108	P/P	80 - 120
2273156	Thallium	106	103	P/P	80 - 120
2273239	Aluminum	99.7		P	80 - 120
2273239	Antimony	106		P	80 - 120
2273239	Arsenic	100		P	80 - 120
2273239	Beryllium	97.3		P	80 - 120
2273239	Boron	99.6		P	80 - 120
2273239	Cadmium	98.0		P	80 - 120
2273239	Chromium	102		P	80 - 120
2273239	Copper	97.3		P	80 - 120
2273239	Lead	105		P	80 - 120
2273239	Nickel	97.5		P	80 - 120
2273239	Selenium	96.4		P	80 - 120
2273239	Silver	104		P	80 - 120
2273239	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273152	Chloride	99.6		P	90 - 110
2273276	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403500

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273152	Sulfate	100		P	90 - 110
2273276	Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403421

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273358	Ammonia-N	98.2	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403349

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273335	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273268	O-Phosphate-P	100	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P403438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273302	Fluoride	97.6	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273256	Organic Carbon	95.6	95.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P403333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273273	Turbidity	12.4	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273156	Barium	1.82	Spike	P	0 - 20
2273156	Calcium	3.89	Spike	P	0 - 20
2273156	Iron	3.32	Spike	P	0 - 20
2273156	Magnesium	3.21	Spike	P	0 - 20
2273156	Manganese	2.70	Spike	P	0 - 20
2273156	Potassium	3.50	Spike	P	0 - 20
2273156	Sodium	1.29	Spike	P	0 - 20
2273156	Zinc	1.14	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273156	Aluminum	3.02	Spike	P	0 - 20
2273156	Antimony	2.82	Spike	P	0 - 20
2273156	Arsenic	2.95	Spike	P	0 - 20
2273156	Beryllium	3.35	Spike	P	0 - 20
2273156	Boron	1.69	Spike	P	0 - 20
2273156	Cadmium	2.45	Spike	P	0 - 20
2273156	Chromium	4.05	Spike	P	0 - 20
2273156	Copper	4.65	Spike	P	0 - 20
2273156	Lead	3.08	Spike	P	0 - 20
2273156	Nickel	4.69	Spike	P	0 - 20
2273156	Selenium	2.56	Spike	P	0 - 20
2273156	Silver	0.248	Spike	P	0 - 20
2273156	Thallium	2.60	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273152	Chloride	0.969	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273358	Ammonia-N	1.02	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273335	NO2NO3-N	0.496	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273268	O-Phosphate-P	0.495	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P403335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273302	Color (true)	0.772	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P403437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273302	Total Alkalinity	1.28	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P403573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273264	TDS	1.01	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P403438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273302	Fluoride	1.90	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P403549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273256	Organic Carbon	0.137	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A107623
Included Lab Sample IDs: 2273276, 2273279

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

Reference Method: SM 2120 B-2011
Run ID: A107624
Included Lab Sample IDs: 2273276, 2273279

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107625
Included Lab Sample IDs: 2273278, 2273281

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A107639
Included Lab Sample IDs: 2273277, 2273280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107663
Included Lab Sample IDs: 2273277, 2273280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A107666
Included Lab Sample IDs: 2273293, 2273294, 2273295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.0	98.4	P/P	90 - 110
Antimony	100	102	P/P	90 - 110
Arsenic	95.1	95.4	P/P	90 - 110
Beryllium	94.0	90.8	P/P	90 - 110
Boron	99.4	98.8	P/P	90 - 110
Cadmium	95.6	97.6	P/P	90 - 110
Chromium	97.4	100	P/P	90 - 110
Copper	92.5	91.9	P/P	90 - 110
Lead	97.8	98.6	P/P	90 - 110
Nickel	92.2	93.0	P/P	90 - 110
Selenium	94.1	96.2	P/P	90 - 110
Thallium	102	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A107669
Included Lab Sample IDs: 2273276, 2273279

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A107669
Included Lab Sample IDs: 2273276, 2273279

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107673
Included Lab Sample IDs: 2273277, 2273280

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A107686
Included Lab Sample IDs: 2273293, 2273294, 2273295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	93.7	94.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A107687
Included Lab Sample IDs: 2273293, 2273294, 2273295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.0	101	P/P	90 - 110
Calcium	102	103	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Manganese	104	106	P/P	90 - 110
Potassium	97.9	98.5	P/P	90 - 110
Sodium	99.2	100	P/P	90 - 110
Zinc	106	109	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A107690
Included Lab Sample IDs: 2273276, 2273279

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	100	100	P/P	90 - 110
Sulfate	99.6	99.7	P/P	90 - 110
Sulfate	99.6	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107697
Included Lab Sample IDs: 2273277, 2273280

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

Reference Method: SM 5310 B-2011
Run ID: A107704
Included Lab Sample IDs: 2273277, 2273280

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.0	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						12.4	
EPA 200.7 Rev. 4.4	Barium	101	104	104	102			1.82
	Calcium	102	104	107				3.89
	Iron	106	111	107	109			3.32
	Magnesium	107	112	108	109			3.21
	Manganese	103	105	101	105			2.70
	Potassium	101	105	101	101			3.50
	Sodium	99.4	107	105	103			1.29
	Zinc	100	105	104	113			1.14
EPA 200.8 Rev. 5.4	Aluminum	97.9	100	97.1	99.7			3.02
	Antimony	103	105	102	106			2.82
	Arsenic	99.0	99.0	96.1	100			2.95
	Beryllium	100	101	97.3	97.3			3.35
	Boron	95.1	97.5	95.8	99.6			1.69
	Cadmium	96.0	98.5	96.1	98.0			2.45
	Chromium	101	104	99.8	102			4.05
	Copper	101	100	95.6	97.3			4.65
	Lead	103	104	101	105			3.08
	Nickel	99.9	99.9	95.3	97.5			4.69
	Selenium	99.4	98.1	95.6	96.4			2.56
	Silver	110	108	108	104			0.248
	Thallium	103	106	103	107			2.60
EPA 300.0 Rev. 2.1	Chloride	100	99.6	99.5			0.969	
	Sulfate	100	100	99.9				
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	98.2	96.8				1.02
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103						
EPA 353.2 Rev. 2.0	NO2NO3-N	103	100	101				0.496
EPA 365.1 Rev. 2.0	Total-P	105						
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	100	99.2				0.495
SM 2120 B-2011	Color (true)	99.1					0.772	
SM 2320 B-2011	Total Alkalinity	103					1.28	
SM 2540 C-2011	TDS						1.01	
SM 4500 F-C-2011	Fluoride	99.5	97.6	100				1.90
SM 5310 B-2011	Organic Carbon	94.8	95.6	95.4				0.137

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2273276, 2273279
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2273293, 2273294, 2273295
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2273293, 2273294, 2273295
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2273276, 2273279
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2273276, 2273279
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2273277, 2273280
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2273277, 2273280
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2273277, 2273280
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2273277, 2273280
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2273278, 2273281
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2273276, 2273279
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2273276, 2273279

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2273293, 2273294, 2273295
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2273276, 2273279
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2273276, 2273279
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2273276, 2273279
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2273277, 2273280

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/02/2021			09/02/2021 13:29	Sarah A Nixon	2273276, 2273279
EPA 200.7 Rev. 4.4	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 16:09	Josef B Mick	2273293
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 16:16	Josef B Mick	2273294
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 16:24	Josef B Mick	2273295
EPA 200.8 Rev. 5.4	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/03/2021 19:10	McKinley C Carter	2273293
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/03/2021 19:19	McKinley C Carter	2273294
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/03/2021 19:28	McKinley C Carter	2273295
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 19:43	Alexander Thompson	2273293
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 19:49	Alexander Thompson	2273294
	09/02/2021	09/02/2021 15:05	Elliott D. Healy	09/08/2021 19:55	Alexander Thompson	2273295
EPA 300.0 Rev. 2.1	09/02/2021			09/08/2021 14:42	Roberta Tatti	2273276
	09/02/2021			09/08/2021 17:44	Roberta Tatti	2273279
EPA 350.1 Rev. 2.0	09/02/2021			09/07/2021 13:04	Ping Hua	2273277
	09/02/2021			09/07/2021 13:05	Ping Hua	2273280
EPA 351.2 Rev. 2.0	09/02/2021	09/08/2021 16:15	Benjamin T. Nordmann	09/09/2021 12:17	Alexandra J Mattheus	2273277
	09/02/2021	09/08/2021 16:15	Benjamin T. Nordmann	09/09/2021 12:19	Alexandra J Mattheus	2273280
EPA 353.2 Rev. 2.0	09/02/2021			09/03/2021 10:09	Beverly Y. Sanders	2273277
	09/02/2021			09/03/2021 10:10	Beverly Y. Sanders	2273280
EPA 365.1 Rev. 2.0	09/02/2021	09/07/2021 15:50	Simonne.V. Calhoun	09/08/2021 10:57	Shengyu Ding	2273277
	09/02/2021	09/07/2021 15:50	Simonne.V. Calhoun	09/08/2021 10:58	Shengyu Ding	2273280
EPA 365.1 Rev. 2.0 dissolved	09/02/2021			09/02/2021 16:52	James L Waggerby	2273278
	09/02/2021			09/02/2021 16:53	James L Waggerby	2273281
SM 2120 B-2011	09/02/2021			09/02/2021 15:20	Sarah A Nixon	2273276
	09/02/2021			09/02/2021 15:22	Sarah A Nixon	2273279
SM 2320 B-2011	09/02/2021			09/07/2021 21:03	Sarah A Nixon	2273276
	09/02/2021			09/07/2021 21:15	Sarah A Nixon	2273279
SM 2340B	09/02/2021			09/08/2021 16:09	Josef B Mick	2273293
	09/02/2021			09/08/2021 16:16	Josef B Mick	2273294
	09/02/2021			09/08/2021 16:24	Josef B Mick	2273295
SM 2540 C-2011	09/02/2021			09/03/2021 14:31	Yijie Li	2273276, 2273279
SM 2540 D-2011	09/02/2021			09/03/2021 14:31	Yijie Li	2273276, 2273279
SM 4500 F-C-2011	09/02/2021			09/07/2021 21:03	Sarah A Nixon	2273276
	09/02/2021			09/07/2021 21:15	Sarah A Nixon	2273279
SM 5310 B-2011	09/02/2021			09/09/2021 03:58	Madeline Gruver	2273277
	09/02/2021			09/09/2021 04:11	Madeline Gruver	2273280