Chemical Analysis Report

NE-DIST-2021-01-13-01

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

Event Description: **Bmap 2 2021 SMP**
Request ID: **RQ-2021-01-11-45**
Customer: **NE-DIST**
Project ID: **SMP**

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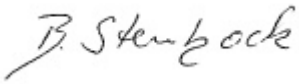
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 03-FEB-2021 18:13



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Trib to Open CR @ Windsor Park Dr. N **Collection Date/Time: 01/12/2021 11:40**

Field ID: 20030858 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2218820	EPA 200.7 Rev. 4.4	Barium	32.1		ug/L	P392428	
		Calcium	32.0		mg/L	P392428	
		Iron	200		ug/L	P392428	
		Magnesium	8.30		mg/L	P392428	
		Manganese	19.7		ug/L	P392428	
		Potassium	3.1		mg/L	P392428	
		Sodium	16.3		mg/L	P392428	
		Zinc	5.0	U	ug/L	P392428	
	EPA 200.8 Rev. 5.4	Aluminum	70		ug/L	P392428	
		Antimony	0.050	U	ug/L	P392428	
		Arsenic	0.71		ug/L	P392428	
		Beryllium	0.024	I	ug/L	P392428	
		Boron**	23.3		ug/L	P392428	
		Cadmium	0.077	I	ug/L	P392428	
		Chromium	0.40	U	ug/L	P392428	
		Copper	41.2		ug/L	P392428	
		Lead	0.76		ug/L	P392428	
		Nickel	0.50	U	ug/L	P392428	
		Selenium	0.20	U	ug/L	P392428	
		Silver	0.010	U	ug/L	P392428	
		Thallium	0.10	U	ug/L	P392428	
	SM 2340B	Hardness	114		mg/L	P392428	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 01/26/2021.

Sample Location: Open Creek at Powerlines East of Danforth Rd. Collection Date/Time: 01/12/2021 12:30

Field ID: 20030950 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2218803	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P392384	
	EPA 300.0 Rev. 2.1	Chloride	37		mg Cl/L	P392555	
		Sulfate	65		mg SO4/L	P392560	
	SM 2120 B-2011	Color (true)	31	A	PCU	P392352	
	SM 2320 B-2011	Total Alkalinity	80		mg CaCO3/L	P392583	
	SM 2540 C-2011	TDS	251		mg/L	P392808	
	SM 2540 D-2011	TSS	2	I	mg/L	P392891	
	SM 4500 F-C-2011	Fluoride	0.074	I	mg F/L	P392585	
2218804	EPA 350.1 Rev. 2.0	Ammonia-N	0.064		mg N/L	P392847	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P392831	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P392664	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P392594	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P392643	
2218805	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P392343	
2218819	EPA 200.7 Rev. 4.4	Barium	42.0		ug/L	P392428	
		Calcium	53.3		mg/L	P392428	
		Iron	410		ug/L	P392428	
		Magnesium	7.79		mg/L	P392428	
		Manganese	22.5		ug/L	P392428	
		Potassium	3.2		mg/L	P392428	
		Sodium	21.8		mg/L	P392428	
		Zinc	5.0	U	ug/L	P392428	
	EPA 200.8 Rev. 5.4	Aluminum	121		ug/L	P392428	
		Antimony	0.16	I	ug/L	P392428	
		Arsenic	0.83		ug/L	P392428	
		Boron**	31.7		ug/L	P392428	
		Cadmium	0.083		ug/L	P392428	
		Chromium	0.40	U	ug/L	P392428	
		Copper	4.04		ug/L	P392428	
		Lead	0.78		ug/L	P392428	
		Nickel	0.50	U	ug/L	P392428	
		Selenium	0.20	U	ug/L	P392428	
		Silver	0.010	U	ug/L	P392428	
		Thallium	0.10	U	ug/L	P392428	
	SM 2340B	Hardness	165		mg/L	P392428	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392384

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392428

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: P392428

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: P392555

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392847

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: P392831

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392664

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392594

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392343

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

Reference Method: SM 2120 B-2011
Batch ID: P392352

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P392583

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

Reference Method: SM 2540 C-2011
Batch ID: P392808

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P392891

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

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: P392643

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: P392428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.0		P	85 - 115
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Manganese	100		P	85 - 115
Potassium	100		P	85 - 115
Sodium	105		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.7		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	93.5		P	85 - 115
Boron	98.7		P	85 - 115
Cadmium	99.9		P	85 - 115
Chromium	107		P	85 - 115
Copper	96.6		P	85 - 115
Lead	103		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	100		P	85 - 115
Silver	109		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392831

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392664

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392594

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: P392343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.1		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P392352

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

Reference Method: SM 2320 B-2011
Batch ID: P392583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P392643

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218962	Barium	101		P	80 - 120
2218962	Calcium	102		P	80 - 120
2218962	Iron	108		P	80 - 120
2218962	Magnesium	108		P	80 - 120
2218962	Manganese	102		P	80 - 120
2218962	Potassium	103		P	80 - 120
2218962	Sodium	104		P	80 - 120
2218962	Zinc	102		P	80 - 120
2219222	Barium	101	103	P/P	80 - 120
2219222	Calcium	107	108	P/P	80 - 120
2219222	Iron	106	106	P/P	80 - 120
2219222	Magnesium	105	106	P/P	80 - 120
2219222	Manganese	101	103	P/P	80 - 120
2219222	Potassium	102	106	P/P	80 - 120
2219222	Sodium	103		P	80 - 120
2219222	Zinc	99.5	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218962	Aluminum	96.0		P	80 - 120
2218962	Antimony	100		P	80 - 120
2218962	Arsenic	97.0		P	80 - 120
2218962	Beryllium	88.0		P	80 - 120
2218962	Boron	89.8		P	80 - 120
2218962	Cadmium	93.4		P	80 - 120
2218962	Chromium	103		P	80 - 120
2218962	Copper	93.9		P	80 - 120
2218962	Lead	102		P	80 - 120
2218962	Nickel	95.4		P	80 - 120
2218962	Selenium	96.0		P	80 - 120
2218962	Silver	106		P	80 - 120
2218962	Thallium	103		P	80 - 120
2219222	Aluminum	96.4	96.9	P/P	80 - 120
2219222	Antimony	104	103	P/P	80 - 120
2219222	Arsenic	99.6	98.7	P/P	80 - 120
2219222	Beryllium	91.7	90.7	P/P	80 - 120
2219222	Boron	96.1	99.9	P/P	80 - 120
2219222	Cadmium	96.2	92.1	P/P	80 - 120
2219222	Chromium	103	103	P/P	80 - 120
2219222	Copper	96.5	96.1	P/P	80 - 120
2219222	Lead	103	103	P/P	80 - 120
2219222	Nickel	97.9	96.9	P/P	80 - 120
2219222	Selenium	96.6	96.8	P/P	80 - 120
2219222	Silver	110	109	P/P	80 - 120
2219222	Thallium	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

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: P392555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218770	Chloride	101		P	90 - 110
2219059	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218770	Sulfate	105		P	90 - 110
2219059	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218771	Ammonia-N	96.0	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218804	Kjeldahl Nitrogen	108	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218602	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218771	Total-P	105	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218604	O-Phosphate-P	97.2	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218606	Fluoride	98.6	99.3	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P392643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218945	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218662	Turbidity	0.738	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219222	Barium	1.87	Spike	P	0 - 20
2219222	Calcium	0.448	Spike	P	0 - 20
2219222	Iron	0.572	Spike	P	0 - 20
2219222	Magnesium	0.427	Spike	P	0 - 20
2219222	Manganese	1.60	Spike	P	0 - 20
2219222	Potassium	3.36	Spike	P	0 - 20
2219222	Sodium	1.89	Spike	P	0 - 20
2219222	Zinc	1.62	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219222	Aluminum	0.488	Spike	P	0 - 20
2219222	Antimony	0.378	Spike	P	0 - 20
2219222	Arsenic	0.847	Spike	P	0 - 20
2219222	Beryllium	1.06	Spike	P	0 - 20
2219222	Boron	3.17	Spike	P	0 - 20
2219222	Cadmium	4.37	Spike	P	0 - 20
2219222	Chromium	0.143	Spike	P	0 - 20
2219222	Copper	0.477	Spike	P	0 - 20
2219222	Lead	0.0331	Spike	P	0 - 20
2219222	Nickel	1.02	Spike	P	0 - 20
2219222	Selenium	0.212	Spike	P	0 - 20
2219222	Silver	1.24	Spike	P	0 - 20
2219222	Thallium	0.313	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218770	Chloride	0.357	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218770	Sulfate	0.499	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218771	Ammonia-N	3.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218804	Kjeldahl Nitrogen	0.453	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218602	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218771	Total-P	3.93	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218604	O-Phosphate-P	1.35	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P392352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218803	Color (true)	1.73	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218606	Total Alkalinity	2.35	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P392808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218770	TDS	5.45	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218606	Fluoride	0.467	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P392643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218945	Organic Carbon	0.927	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: A103033
Included Lab Sample IDs: 2218805

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.0	98.4	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A103037
Included Lab Sample IDs: 2218803

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A103056
Included Lab Sample IDs: 2218803

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A103099
Included Lab Sample IDs: 2218819, 2218820

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	98.7	98.9	P/P	90 - 110
Iron	98.9	98.9	P/P	90 - 110
Magnesium	98.6	98.1	P/P	90 - 110
Manganese	104	105	P/P	90 - 110
Potassium	99.2	99.8	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A103125
Included Lab Sample IDs: 2218803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	102	103	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A103129
Included Lab Sample IDs: 2218803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.4	97.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A103129
Included Lab Sample IDs: 2218803

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A103143
Included Lab Sample IDs: 2218804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103152
Included Lab Sample IDs: 2218804

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103197
Included Lab Sample IDs: 2218804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.3	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103199
Included Lab Sample IDs: 2218804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103222
Included Lab Sample IDs: 2218819, 2218820

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.8	98.7	P/P	90 - 110
Antimony	100	98.3	P/P	90 - 110
Arsenic	99.0	96.6	P/P	90 - 110
Beryllium	94.3	93.0	P/P	90 - 110
Boron	103	110	P/P	90 - 110
Chromium	106	104	P/P	90 - 110
Copper	95.5	93.8	P/P	90 - 110
Lead	99.9	99.4	P/P	90 - 110
Nickel	97.2	95.3	P/P	90 - 110
Selenium	98.0	98.3	P/P	90 - 110
Silver	106	104	P/P	90 - 110
Thallium	102	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103247
Included Lab Sample IDs: 2218804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103250
Included Lab Sample IDs: 2218819, 2218820

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	96.8	95.6	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.738	
EPA 200.7 Rev. 4.4	Barium	99.0	101	101	103			1.87
	Calcium	104	102	107	108			0.448
	Iron	102	108	106	106			0.572
	Magnesium	103	108	105	106			0.427
	Manganese	100	102	101	103			1.60
	Potassium	100	103	102	106			3.36
	Sodium	105	104	103				1.89
	Zinc	99.6	102	99.5	101			1.62
EPA 200.8 Rev. 5.4	Aluminum	98.7	96.4	96.9	96.0			0.488
	Antimony	105	104	103	100			0.378
	Arsenic	101	99.6	98.7	97.0			0.847
	Beryllium	93.5	91.7	90.7	88.0			1.06
	Boron	98.7	96.1	99.9	89.8			3.17
	Cadmium	99.9	96.2	92.1	93.4			4.37
	Chromium	107	103	103	103			0.143
	Copper	96.6	96.5	96.1	93.9			0.477
	Lead	103	103	103	102			0.0331
	Nickel	98.0	97.9	96.9	95.4			1.02
	Selenium	100	96.6	96.8	96.0			0.212
	Silver	109	110	109	106			1.24
	Thallium	102	102	102	103			0.313
EPA 300.0 Rev. 2.1	Chloride	103	101	103			0.357	
	Sulfate	104	105	104			0.499	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	96.0	99.6				3.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	108	108				0.453
EPA 353.2 Rev. 2.0	NO2NO3-N	101	101	101				0.0
EPA 365.1 Rev. 2.0	Total-P	103	105	109				3.93
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1	97.2	95.9				1.35
SM 2120 B-2011	Color (true)	101					1.73	
SM 2320 B-2011	Total Alkalinity	97.8					2.35	
SM 2540 C-2011	TDS						5.45	
SM 4500 F-C-2011	Fluoride	98.8	98.6	99.3				0.467
SM 5310 B-2011	Organic Carbon	98.8	102	101				0.927

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2218803
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2218819, 2218820
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2218819, 2218820
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2218803
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2218803
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2218804
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2218804
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2218804
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2218804
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2218805
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2218803
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2218803

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2218819, 2218820
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2218803
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2218803
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2218803
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2218804

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	01/13/2021			01/13/2021 15:34	Yen Ta	2218803
EPA 200.7 Rev. 4.4	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/15/2021 16:32	Betina Topolski	2218819
	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/15/2021 16:40	Betina Topolski	2218820
EPA 200.8 Rev. 5.4	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/25/2021 17:15	Alexander Thompson	2218819
	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/25/2021 17:23	Alexander Thompson	2218820
	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/26/2021 13:48	Alexander Thompson	2218819
	01/13/2021	01/14/2021 17:00	Elliott D. Healy	01/26/2021 13:53	Alexander Thompson	2218820
EPA 300.0 Rev. 2.1	01/13/2021			01/16/2021 08:01	Julia Storbeck	2218803
EPA 350.1 Rev. 2.0	01/13/2021			01/23/2021 14:49	Ping Hua	2218804
EPA 351.2 Rev. 2.0	01/13/2021	01/25/2021 12:37	Yen Ta	01/26/2021 14:53	Julia Storbeck	2218804
EPA 353.2 Rev. 2.0	01/13/2021			01/21/2021 09:04	Beverly Y. Sanders	2218804
EPA 365.1 Rev. 2.0	01/13/2021	01/20/2021 18:21	Madeline Gruver	01/22/2021 16:11	Shengyu Wang	2218804
EPA 365.1 Rev. 2.0 dissolved	01/13/2021			01/13/2021 14:36	Blanca Fach	2218805
SM 2120 B-2011	01/13/2021			01/13/2021 16:08	Benjamin T. Nordmann	2218803
SM 2320 B-2011	01/13/2021			01/15/2021 20:23	Dale L. Simmons	2218803
SM 2340B	01/13/2021			01/15/2021 16:32	Betina Topolski	2218819
	01/13/2021			01/15/2021 16:40	Betina Topolski	2218820
SM 2540 C-2011	01/13/2021			01/15/2021 15:02	Yijie Li	2218803
SM 2540 D-2011	01/13/2021			01/15/2021 15:02	Yijie Li	2218803
SM 4500 F-C-2011	01/13/2021			01/15/2021 20:23	Dale L. Simmons	2218803
SM 5310 B-2011	01/13/2021			01/19/2021 21:45	Touraj Touran	2218804