Chemical Analysis Report

SO-DIST-2022-03-17-01

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

Event Description: **2022 SMP : Charlotte Harbor**
Request ID: **RQ-2022-03-21-40**
Customer: **SO-DIST**
Project ID: **SMP**

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FLDEP South District Office
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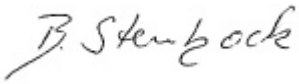
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 08-APR-2022 16:05



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: Trailer Park Canal **Collection Date/Time: 03/16/2022 10:05**

Field ID: G3SD0072 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313140	EPA 200.7 Rev. 4.4	Calcium	318		mg/L	P411446	
		Iron	120	U	ug/L	P411446	
		Magnesium	980		mg/L	P411446	
		Strontium	6.56E+03		ug/L	P411446	
		Tin	150	U	ug/L	P411446	
		Titanium	3.8	I	ug/L	P411446	
		Vanadium	8.0	U	ug/L	P411446	
		Zinc	20	U	ug/L	P411446	
	EPA 200.8 Rev. 5.4	Aluminum	49	I	ug/L	P411446	
		Antimony	0.21	I	ug/L	P411446	
		Arsenic	1.99		ug/L	P411446	
		Beryllium	0.040	U	ug/L	P411446	
		Cadmium	0.080	U	ug/L	P411446	
		Chromium	1.6	U	ug/L	P411446	
		Cobalt	0.10	I	ug/L	P411446	
		Copper	2.1	I	ug/L	P411446	
		Lead	2.0	U	ug/L	P411446	
		Manganese	8.0		ug/L	P411446	
		Molybdenum	9.2		ug/L	P411446	
		Nickel	2.0	U	ug/L	P411446	
		Selenium	0.80	U	ug/L	P411446	
		Silver	0.040	U	ug/L	P411446	
		Thallium	1.0	U	ug/L	P411446	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium and strontium are unavailable because of high analyte concentration in the QC sample.

Sample Location: Myakka cutoff (Western Portion) **Collection Date/Time: 03/16/2022 10:20**

Field ID: G3SD0073 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313101	EPA 180.1 Rev. 2.0	Turbidity	6.2		NTU	P411246	
	SM 2320 B-2011	Total Alkalinity	118		mg CaCO3/L	P411447	
	SM 2540 D-2011	TSS	18		mg/L	P411432	
	SM 4500 F-C-2011	Fluoride	1.1		mg F/L	P411455	
2313104	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P411493	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P411636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P411280	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P411412	
	SM 5310 B-2011	Organic Carbon	7.2		mg C/L	P411420	

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

Sample Location: FB **Collection Date/Time: 03/16/2022 10:26**

Field ID: FB_03162022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313107	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P411246	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P411445	
	SM 2540 D-2011	TSS	2	U	mg/L	P411431	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P411454	
2313108	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P411488	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P411465	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P411335	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P411458	
	SM 5310 B-2011	Organic Carbon	0.76	I	mg C/L	P411402	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 5310 B-2011: The result was confirmed on 03/24/2022.

Sample Location: Tippecanoe Bay North **Collection Date/Time: 03/16/2022 11:00**

Field ID: G3SD0218 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313102	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P411246	
	SM 2320 B-2011	Total Alkalinity	116	A	mg CaCO3/L	P411447	
	SM 2540 D-2011	TSS	4	I	mg/L	P411432	
	SM 4500 F-C-2011	Fluoride	1.0		mg F/L	P411455	
2313105	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P411493	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P411636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P411280	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P411459	
	SM 5310 B-2011	Organic Carbon	8.2		mg C/L	P411596	

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

Sample Location: Myakka River West **Collection Date/Time: 03/16/2022 11:45**

Field ID: G3SD0219 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313103	EPA 180.1 Rev. 2.0	Turbidity	2.4	A	NTU	P411246	
	SM 2320 B-2011	Total Alkalinity	111		mg CaCO3/L	P411447	
	SM 2540 D-2011	TSS	3	I	mg/L	P411432	
	SM 4500 F-C-2011	Fluoride	0.85		mg F/L	P411455	
2313106	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P411701	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P411467	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P411280	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P411459	
	SM 5310 B-2011	Organic Carbon	9.4		mg C/L	P411596	

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: P411246

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411446

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411446

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
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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 350.1 Rev. 2.0
Batch ID: P411488

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411493

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411701

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: P411465

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411280

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411412

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411459

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

Reference Method: SM 2320 B-2011
Batch ID: P411445

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P411447

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

Reference Method: SM 2540 D-2011
Batch ID: P411431

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P411432

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P411455

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P411402

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

Reference Method: SM 5310 B-2011
Batch ID: P411420

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

Reference Method: SM 5310 B-2011
Batch ID: P411596

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411446

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	105		P	85 - 115
Strontium	103		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	95.7		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411446

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.2		P	85 - 115
Antimony	98.2		P	85 - 115
Arsenic	96.6		P	85 - 115
Beryllium	92.4		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	95.1		P	85 - 115
Cobalt	96.7		P	85 - 115
Copper	93.7		P	85 - 115
Lead	95.0		P	85 - 115
Manganese	96.2		P	85 - 115
Molybdenum	96.8		P	85 - 115
Nickel	95.7		P	85 - 115
Selenium	97.0		P	85 - 115
Silver	97.8		P	85 - 115
Thallium	97.2		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411488

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411493

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411701

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411465

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411636

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411412

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411459

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

Reference Method: SM 2320 B-2011
Batch ID: P411445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.4		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P411447

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.9		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P411455

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P411402

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.9		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P411420

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

Reference Method: SM 5310 B-2011
Batch ID: P411596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313210	Iron	97.8	101	P/P	70 - 130
2313210	Tin	71.8	81.7	P/P	70 - 130
2313210	Titanium	94.5	96.5	P/P	70 - 130
2313210	Vanadium	95.7	95.4	P/P	70 - 130
2313210	Zinc	93.2	94.8	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313210	Aluminum	103	107	P/P	70 - 130
2313210	Antimony	98.6	100	P/P	70 - 130
2313210	Arsenic	109	110	P/P	70 - 130
2313210	Beryllium	106	106	P/P	70 - 130
2313210	Cadmium	89.8	94.2	P/P	70 - 130
2313210	Chromium	97.5	98.2	P/P	70 - 130
2313210	Cobalt	112	113	P/P	70 - 130
2313210	Copper	102	103	P/P	70 - 130
2313210	Lead	101	102	P/P	70 - 130
2313210	Manganese	95.1	96.2	P/P	70 - 130
2313210	Molybdenum	110	113	P/P	70 - 130
2313210	Nickel	108	111	P/P	70 - 130
2313210	Selenium	96.2	99.2	P/P	70 - 130
2313210	Silver	86.1	88.2	P/P	70 - 130
2313210	Thallium	103	106	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313089	Ammonia-N	96.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312725	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313106	Ammonia-N	98.0	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312782	Kjeldahl Nitrogen	98.9	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312936	Kjeldahl Nitrogen	107	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312725	Kjeldahl Nitrogen	101	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312936	NO2NO3-N	95.1	94.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313045	NO2NO3-N	99.4	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313059	Total-P	95.1	94.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313158	Total-P	106	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313105	Total-P	96.5	93.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313039	Fluoride	99.3	99.3	P/P	92 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P411455

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313102	Fluoride	98.8	100	P/P	92 - 107

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P411402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312784	Organic Carbon	95.4	94.3	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P411420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312721	Organic Carbon	89.2	88.7	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P411596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313198	Organic Carbon	93.4	95.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313103	Turbidity	16.7	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313210	Calcium	2.92	Spike	P	0 - 20
2313210	Iron	3.07	Spike	P	0 - 20
2313210	Magnesium	2.54	Spike	P	0 - 20
2313210	Strontium	2.43	Spike	P	0 - 20
2313210	Tin	12.9	Spike	P	0 - 20
2313210	Titanium	1.74	Spike	P	0 - 20
2313210	Vanadium	0.333	Spike	P	0 - 20
2313210	Zinc	1.72	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313210	Aluminum	3.50	Spike	P	0 - 20
2313210	Antimony	1.69	Spike	P	0 - 20
2313210	Arsenic	1.44	Spike	P	0 - 20
2313210	Beryllium	0.197	Spike	P	0 - 20
2313210	Cadmium	4.82	Spike	P	0 - 20
2313210	Chromium	0.735	Spike	P	0 - 20
2313210	Cobalt	1.20	Spike	P	0 - 20
2313210	Copper	0.935	Spike	P	0 - 20
2313210	Lead	1.61	Spike	P	0 - 20
2313210	Manganese	0.861	Spike	P	0 - 20
2313210	Molybdenum	1.95	Spike	P	0 - 20
2313210	Nickel	2.32	Spike	P	0 - 20
2313210	Selenium	3.11	Spike	P	0 - 20
2313210	Silver	2.46	Spike	P	0 - 20
2313210	Thallium	3.35	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411488

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313089	Ammonia-N	2.42	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312725	Ammonia-N	0.841	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313106	Ammonia-N	0.528	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312782	Kjeldahl Nitrogen	2.99	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312936	Kjeldahl Nitrogen	2.38	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312725	Kjeldahl Nitrogen	6.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312936	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313045	NO2NO3-N	0.355	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313059	Total-P	0.925	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313158	Total-P	5.12	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313105	Total-P	2.94	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P411445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313039	Total Alkalinity	1.78	Sample	P	0 - 5.2

Reference Method: SM 2320 B-2011
Batch ID: P411447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313102	Total Alkalinity	0.690	Sample	P	0 - 5.2

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313039	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 4500 F-C-2011
Batch ID: P411455

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313102	Fluoride	0.986	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P411402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312784	Organic Carbon	0.938	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P411420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312721	Organic Carbon	0.500	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P411596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313198	Organic Carbon	1.43	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: A111005
Included Lab Sample IDs: 2313101, 2313102, 2313103, 2313107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111021
Included Lab Sample IDs: 2313104, 2313105, 2313106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111053
Included Lab Sample IDs: 2313108

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

Reference Method: SM 5310 B-2011
Run ID: A111082
Included Lab Sample IDs: 2313108

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.4	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111087
Included Lab Sample IDs: 2313104

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	91.1	93.5	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A111098
Included Lab Sample IDs: 2313101, 2313102, 2313103, 2313107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.1	97.7	P/P	90 - 110
Total Alkalinity	97.7	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A111098
Included Lab Sample IDs: 2313101, 2313102, 2313103, 2313107

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111108
Included Lab Sample IDs: 2313108

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111108
Included Lab Sample IDs: 2313108

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111115
Included Lab Sample IDs: 2313104, 2313105

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111122
Included Lab Sample IDs: 2313140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.9	103	P/P	90 - 110
Antimony	97.0	98.7	P/P	90 - 110
Arsenic	101	102	P/P	90 - 110
Beryllium	97.4	102	P/P	90 - 110
Cadmium	98.6	99.7	P/P	90 - 110
Chromium	97.3	99.2	P/P	90 - 110
Cobalt	103	102	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	96.1	96.5	P/P	90 - 110
Manganese	98.9	99.4	P/P	90 - 110
Molybdenum	99.7	99.8	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Selenium	101	102	P/P	90 - 110
Silver	96.6	96.3	P/P	90 - 110
Thallium	99.0	99.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111123
Included Lab Sample IDs: 2313140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.8	99.2	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	99.7	99.7	P/P	90 - 110
Strontium	94.5	94.8	P/P	90 - 110
Tin	94.6	95.6	P/P	90 - 110
Titanium	95.2	94.8	P/P	90 - 110
Vanadium	95.0	94.8	P/P	90 - 110
Zinc	96.8	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111135
Included Lab Sample IDs: 2313104

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A111155
Included Lab Sample IDs: 2313105, 2313106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.0	95.8	P/P	90 - 110
Organic Carbon	97.2	93.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111157
Included Lab Sample IDs: 2313105, 2313106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110
Total-P	98.8	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111163
Included Lab Sample IDs: 2313108

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111178
Included Lab Sample IDs: 2313106, 2313108

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	P/P	90 - 110
Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111210
Included Lab Sample IDs: 2313106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111315
Included Lab Sample IDs: 2313104, 2313105

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.3	99.4	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		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity	96.9				16.7	
EPA 200.7 Rev. 4.4	Calcium	105					2.92
	Iron	106	97.8	101			3.07
	Magnesium	105					2.54
	Strontium	103					2.43
	Tin	104	71.8	81.7			12.9
	Titanium	103	94.5	96.5			1.74
	Vanadium	95.7	95.7	95.4			0.333
	Zinc	102	93.2	94.8			1.72
EPA 200.8 Rev. 5.4	Aluminum	98.2	103	107			3.50
	Antimony	98.2	98.6	100			1.69
	Arsenic	96.6	109	110			1.44
	Beryllium	92.4	106	106			0.197
	Cadmium	97.0	89.8	94.2			4.82
	Chromium	95.1	97.5	98.2			0.735
	Cobalt	96.7	112	113			1.20
	Copper	93.7	102	103			0.935
	Lead	95.0	101	102			1.61
	Manganese	96.2	95.1	96.2			0.861
	Molybdenum	96.8	110	113			1.95
	Nickel	95.7	108	111			2.32
	Selenium	97.0	96.2	99.2			3.11
	Silver	97.8	86.1	88.2			2.46
	Thallium	97.2	103	106			3.35
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	96.8	100			2.42
	Ammonia-N	99.0	102	103			0.841
	Ammonia-N	100	98.0	98.8			0.528
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	98.9	103			2.99
	Kjeldahl Nitrogen	104	107	104			2.38
	Kjeldahl Nitrogen	95.8	101	108			6.02
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	95.1	94.6			0.504
	NO2NO3-N	99.5	99.4	98.9			0.355
EPA 365.1 Rev. 2.0	Total-P	101	95.1	94.1			0.925
	Total-P	103	106	101			5.12
	Total-P	102	96.5	93.2			2.94
SM 2320 B-2011	Total Alkalinity	97.4				1.78	
	Total Alkalinity	96.9				0.690	
SM 4500 F-C-2011	Fluoride	101	99.3	99.3			0.0
	Fluoride	101	98.8	100			0.986
SM 5310 B-2011	Organic Carbon	93.9	95.4	94.3			0.938
	Organic Carbon	93.6	89.2	88.7			0.500
	Organic Carbon	97.2	93.4	95.1			1.43

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2313101, 2313102, 2313103, 2313107
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2313140
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2313140
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2313104, 2313105, 2313106, 2313108
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2313104, 2313105, 2313106, 2313108

Reference Method Descriptions

Method	Description	Associated Samples
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2313104, 2313105, 2313106, 2313108
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2313104, 2313105, 2313106, 2313108
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2313101, 2313102, 2313103, 2313107
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2313101, 2313102, 2313103, 2313107
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2313101, 2313102, 2313103, 2313107
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2313104, 2313105, 2313106, 2313108

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	03/17/2022			03/17/2022 14:58	Khloe J Berg	2313103
	03/17/2022			03/17/2022 15:26	Khloe J Berg	2313101
	03/17/2022			03/17/2022 15:27	Khloe J Berg	2313102
	03/17/2022			03/17/2022 15:28	Khloe J Berg	2313107
EPA 200.7 Rev. 4.4	03/17/2022	03/23/2022 10:20	Megan Whitefoot	03/24/2022 00:43	Josef B Mick	2313140
	03/17/2022	03/23/2022 10:20	Megan Whitefoot	03/24/2022 00:51	Josef B Mick	2313140
EPA 200.8 Rev. 5.4	03/17/2022	03/23/2022 10:20	Megan Whitefoot	03/23/2022 17:51	Alexander Thompson	2313140
	03/17/2022	03/23/2022 10:20	Megan Whitefoot	03/23/2022 19:18	Alexander Thompson	2313140
EPA 350.1 Rev. 2.0	03/17/2022			03/23/2022 12:16	Judith K. Clark	2313108
	03/17/2022			03/23/2022 12:18	Ping Hua	2313104
	03/17/2022			03/23/2022 12:20	Ping Hua	2313105
	03/17/2022			03/29/2022 10:37	Ping Hua	2313106
EPA 351.2 Rev. 2.0	03/17/2022	03/24/2022 16:16	Samantha L Bates	03/25/2022 16:20	Alexandra J Mattheus	2313108
	03/17/2022	03/24/2022 16:17	Samantha L Bates	03/25/2022 17:11	Alexandra J Mattheus	2313106
	03/17/2022	03/29/2022 08:58	Samantha L Bates	04/05/2022 12:14	Alexandra J Mattheus	2313104
	03/17/2022	03/29/2022 08:58	Samantha L Bates	04/05/2022 12:16	Alexandra J Mattheus	2313105
EPA 353.2 Rev. 2.0	03/17/2022			03/18/2022 11:00	Beverly Y. Sanders	2313104
	03/17/2022			03/18/2022 11:02	Beverly Y. Sanders	2313105
	03/17/2022			03/18/2022 11:03	Beverly Y. Sanders	2313106
	03/17/2022			03/21/2022 09:38	Beverly Y. Sanders	2313108
EPA 365.1 Rev. 2.0	03/17/2022	03/22/2022 15:55	Simonne.V. Calhoun	03/24/2022 11:53	Sarah A Nixon	2313104
	03/17/2022	03/23/2022 17:20	Simonne.V. Calhoun	03/25/2022 12:12	Sarah A Nixon	2313105
	03/17/2022	03/23/2022 17:20	Simonne.V. Calhoun	03/25/2022 12:18	Sarah A Nixon	2313106
	03/17/2022	03/23/2022 17:20	Simonne.V. Calhoun	03/25/2022 14:37	James L Waggerby	2313108
SM 2320 B-2011	03/17/2022			03/22/2022 20:28	Dale L. Simmons	2313107
	03/17/2022			03/22/2022 23:27	Dale L. Simmons	2313102
	03/17/2022			03/22/2022 23:41	Dale L. Simmons	2313101
	03/17/2022			03/22/2022 23:55	Dale L. Simmons	2313103
SM 2540 D-2011	03/17/2022			03/18/2022 16:00	Simonne.V. Calhoun	2313101, 2313102, 2313103, 2313107
SM 4500 F-C-2011	03/17/2022			03/22/2022 20:28	Dale L. Simmons	2313107
	03/17/2022			03/22/2022 21:41	Dale L. Simmons	2313102
	03/17/2022			03/22/2022 21:55	Dale L. Simmons	2313101
	03/17/2022			03/22/2022 22:01	Dale L. Simmons	2313103
SM 5310 B-2011	03/17/2022			03/22/2022 01:03	Touraj Touran	2313108
	03/17/2022			03/22/2022 09:56	Khloe J Berg	2313104
	03/17/2022			03/25/2022 01:31	Khloe J Berg	2313105
	03/17/2022			03/25/2022 02:22	Khloe J Berg	2313106