

Chemical Analysis Report

CEN-DIST-2022-05-03-01

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

Event Description: **Run 11**
Request ID: **RQ-2022-04-04-50**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 23-MAY-2022 09:45



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: Roberts Branch @ Curryville Rd

Collection Date/Time: 05/02/2022 11:01

Field ID: G3CE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2323386	DEP SOP: NU-094-1	Color (true)**	350		PCU	P413300	
	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P413297	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P413787	
		Sulfate	1.6		mg SO4/L	P413790	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P413565	
	SM 2540 C-2011	TDS	94		mg/L	P413686	
	SM 2540 D-2011	TSS	3	I	mg/L	P413679	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P413567	
2323387	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P413436	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P413657	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.026		mg N/L	P413483	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P413545	
	SM 5310 B-2011	Organic Carbon	32		mg C/L	P413819	
2323392	EPA 200.7 Rev. 4.4	Calcium	3.82		mg/L	P413386	
		Iron	470		ug/L	P413386	
		Magnesium	1.16		mg/L	P413386	
		Potassium	0.85	I	mg/L	P413386	
		Sodium	8.4		mg/L	P413386	
		Strontium	22.5		ug/L	P413386	
		Tin	3.0	U	ug/L	P413386	
		Titanium	2.2	I	ug/L	P413386	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P413386	
		Zinc	5.7	I	ug/L	P413386	
		Aluminum	440		ug/L	P413386	
		Antimony	0.050	U	ug/L	P413386	
		Arsenic	0.36		ug/L	P413386	
		Barium	9.28		ug/L	P413386	
		Beryllium	0.021	I	ug/L	P413386	
		Boron**	19.0		ug/L	P413386	
		Cadmium	0.020	U	ug/L	P413386	
		Chromium	0.49	I	ug/L	P413386	
		Cobalt	0.109		ug/L	P413386	
		Copper	0.40	U	ug/L	P413386	
		Lead	0.35	I	ug/L	P413386	
		Manganese	5.02		ug/L	P413386	
		Molybdenum	0.15	U	ug/L	P413386	
		Nickel	0.50	U	ug/L	P413386	
		Selenium	0.20	U	ug/L	P413386	
		Silver	0.010	U	ug/L	P413386	
		Thallium	0.10	U	ug/L	P413386	
		SM 2340 B-2011	Hardness	14.3		mg/L	P413386

Ref. Method and Comment:

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

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

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P413300

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413297

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413386

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	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: P413386

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	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
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 300.0 Rev. 2.1
Batch ID: P413787

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413790

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413436

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413545

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

Reference Method: SM 2320 B-2011
Batch ID: P413565

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

Reference Method: SM 2540 C-2011
Batch ID: P413686

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413679

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413567

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: P413819

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P413300

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.2		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413297

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413386

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	104		P	85 - 115
Sodium	99.9		P	85 - 115
Strontium	103		P	85 - 115
Tin	103		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.7		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413386

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.9		P	85 - 115
Antimony	98.6		P	85 - 115
Arsenic	99.4		P	85 - 115
Barium	103		P	85 - 115
Beryllium	94.4		P	85 - 115
Boron	98.7		P	85 - 115
Cadmium	96.7		P	85 - 115
Chromium	97.5		P	85 - 115
Cobalt	99.1		P	85 - 115
Copper	97.7		P	85 - 115
Lead	98.4		P	85 - 115
Manganese	98.3		P	85 - 115
Molybdenum	98.9		P	85 - 115
Nickel	98.9		P	85 - 115
Selenium	99.5		P	85 - 115
Silver	96.6		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413787

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413436

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413483

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: P413545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.6		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P413565

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.3		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413567

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P413819

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P413386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323733	Calcium	97.7		P	80 - 120
2323733	Iron	103		P	80 - 120
2323733	Magnesium	99.2		P	80 - 120
2323733	Potassium	100		P	80 - 120
2323733	Sodium	97.0		P	80 - 120
2323733	Strontium	100		P	80 - 120
2323733	Tin	99.4		P	80 - 120
2323733	Titanium	102		P	80 - 120
2323733	Vanadium	98.0		P	80 - 120
2323733	Zinc	103		P	80 - 120
2324070	Calcium	95.5		P	80 - 120
2324070	Iron	105	103	P/P	80 - 120
2324070	Magnesium	96.5		P	80 - 120
2324070	Potassium	105	102	P/P	80 - 120
2324070	Sodium	96.1		P	80 - 120
2324070	Strontium	106	104	P/P	80 - 120
2324070	Tin	106	102	P/P	80 - 120
2324070	Titanium	105	103	P/P	80 - 120
2324070	Vanadium	101	98.9	P/P	80 - 120
2324070	Zinc	105	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P413386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323733	Aluminum	95.3		P	80 - 120
2323733	Antimony	101		P	80 - 120
2323733	Arsenic	97.8		P	80 - 120
2323733	Barium	102		P	80 - 120
2323733	Beryllium	90.1		P	80 - 120
2323733	Boron	97.9		P	80 - 120
2323733	Cadmium	98.7		P	80 - 120
2323733	Chromium	99.4		P	80 - 120
2323733	Cobalt	95.4		P	80 - 120
2323733	Copper	93.8		P	80 - 120
2323733	Lead	98.6		P	80 - 120
2323733	Manganese	99.4		P	80 - 120
2323733	Molybdenum	102		P	80 - 120
2323733	Nickel	96.0		P	80 - 120
2323733	Selenium	95.6		P	80 - 120
2323733	Silver	94.8		P	80 - 120
2323733	Thallium	104		P	80 - 120
2324070	Aluminum	95.2	95.9	P/P	80 - 120
2324070	Antimony	101	102	P/P	80 - 120
2324070	Arsenic	98.9	99.1	P/P	80 - 120
2324070	Barium	103	104	P/P	80 - 120
2324070	Beryllium	94.6	93.4	P/P	80 - 120
2324070	Boron	98.8	99.5	P/P	80 - 120
2324070	Cadmium	101	101	P/P	80 - 120
2324070	Chromium	99.0	99.5	P/P	80 - 120
2324070	Cobalt	97.1	96.7	P/P	80 - 120
2324070	Copper	93.4	93.7	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P413386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324070	Lead	97.8	98.4	P/P	80 - 120
2324070	Manganese	98.8	100	P/P	80 - 120
2324070	Molybdenum	101	103	P/P	80 - 120
2324070	Nickel	97.3	97.0	P/P	80 - 120
2324070	Selenium	97.3	97.5	P/P	80 - 120
2324070	Silver	96.0	97.5	P/P	80 - 120
2324070	Thallium	103	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P413787

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323736	Chloride	101		P	90 - 110
2323869	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P413790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323736	Sulfate	94.6		P	90 - 110
2323869	Sulfate	93.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323358	Ammonia-N	102	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323358	NO2NO3-N	95.4	95.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323535	Total-P	103	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Batch ID: P413567

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323243	Fluoride	100	99.2	P/P	92 - 107

Reference Method: SM 5310 B-2011

Batch ID: P413819

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324925	Organic Carbon	96.0	98.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P413300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323805	Color (true)	0.465	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323471	Turbidity	0.565	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324070	Calcium	0.626	Spike	P	0 - 20
2324070	Iron	1.69	Spike	P	0 - 20
2324070	Magnesium	0.0269	Spike	P	0 - 20
2324070	Potassium	1.89	Spike	P	0 - 20
2324070	Sodium	0.243	Spike	P	0 - 20
2324070	Strontium	1.49	Spike	P	0 - 20
2324070	Tin	4.19	Spike	P	0 - 20
2324070	Titanium	2.36	Spike	P	0 - 20
2324070	Vanadium	1.65	Spike	P	0 - 20
2324070	Zinc	2.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324070	Aluminum	0.809	Spike	P	0 - 20
2324070	Antimony	1.06	Spike	P	0 - 20
2324070	Arsenic	0.233	Spike	P	0 - 20
2324070	Barium	0.711	Spike	P	0 - 20
2324070	Beryllium	1.27	Spike	P	0 - 20
2324070	Boron	0.598	Spike	P	0 - 20
2324070	Cadmium	0.105	Spike	P	0 - 20
2324070	Chromium	0.471	Spike	P	0 - 20
2324070	Cobalt	0.434	Spike	P	0 - 20
2324070	Copper	0.371	Spike	P	0 - 20
2324070	Lead	0.658	Spike	P	0 - 20
2324070	Manganese	1.66	Spike	P	0 - 20
2324070	Molybdenum	1.35	Spike	P	0 - 20
2324070	Nickel	0.322	Spike	P	0 - 20
2324070	Selenium	0.205	Spike	P	0 - 20
2324070	Silver	1.51	Spike	P	0 - 20
2324070	Thallium	0.293	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323736	Chloride	0.756	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323736	Sulfate	0.471	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323358	Ammonia-N	1.91	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323554	Kjeldahl Nitrogen	0.590	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323358	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323535	Total-P	0.408	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323243	Total Alkalinity	1.45	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P413686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324087	TDS	2.92	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P413567

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323243	Fluoride	0.480	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P413819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324925	Organic Carbon	1.63	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: A111883

Included Lab Sample IDs: 2323386

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

Reference Method: DEP SOP: NU-094-1

Run ID: A111884

Included Lab Sample IDs: 2323386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A111943

Included Lab Sample IDs: 2323387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.1	96.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111947

Included Lab Sample IDs: 2323392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.3	97.7	P/P	90 - 110
Antimony	99.8	101	P/P	90 - 110
Arsenic	97.8	96.8	P/P	90 - 110
Barium	99.2	99.5	P/P	90 - 110
Beryllium	95.6	94.2	P/P	90 - 110
Boron	97.8	97.1	P/P	90 - 110
Cadmium	99.4	99.8	P/P	90 - 110
Chromium	98.5	99.0	P/P	90 - 110
Cobalt	95.7	94.8	P/P	90 - 110
Copper	96.4	95.4	P/P	90 - 110
Lead	96.6	95.8	P/P	90 - 110
Manganese	98.6	99.4	P/P	90 - 110
Molybdenum	97.9	97.4	P/P	90 - 110
Nickel	96.2	95.5	P/P	90 - 110
Selenium	99.2	99.5	P/P	90 - 110
Silver	99.1	98.7	P/P	90 - 110
Thallium	96.7	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A111958

Included Lab Sample IDs: 2323387

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111983

Included Lab Sample IDs: 2323392

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111983

Included Lab Sample IDs: 2323392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.1	101	P/P	90 - 110
Iron	99.7	101	P/P	90 - 110
Magnesium	99.1	101	P/P	90 - 110
Potassium	98.2	98.9	P/P	90 - 110
Sodium	98.0	98.4	P/P	90 - 110
Strontium	99.7	101	P/P	90 - 110
Tin	104	99.9	P/P	90 - 110
Titanium	104	99.9	P/P	90 - 110
Vanadium	102	102	P/P	90 - 110
Zinc	106	101	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A111988

Included Lab Sample IDs: 2323386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.0	96.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A111988

Included Lab Sample IDs: 2323386

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112031

Included Lab Sample IDs: 2323387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.4	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112112

Included Lab Sample IDs: 2323387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.8	99.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A112115

Included Lab Sample IDs: 2323386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A112128

Included Lab Sample IDs: 2323387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.8	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	99.2				0.465	
EPA 180.1 Rev. 2.0	Turbidity	95.9				0.565	
EPA 200.7 Rev. 4.4	Calcium	103	97.7	95.5			0.626
	Iron	104	103	105	103		1.69
	Magnesium	100	99.2	96.5			0.0269
	Potassium	104	100	105	102		1.89
	Sodium	99.9	97.0	96.1			0.243
	Strontium	103	100	106	104		1.49
	Tin	103	99.4	106	102		4.19
	Titanium	103	102	105	103		2.36
	Vanadium	96.7	98.0	101	98.9		1.65
	Zinc	103	103	105	103		2.16
EPA 200.8 Rev. 5.4	Aluminum	98.9	95.2	95.9	95.3		0.809
	Antimony	98.6	101	102	101		1.06
	Arsenic	99.4	98.9	99.1	97.8		0.233
	Barium	103	103	104	102		0.711
	Beryllium	94.4	94.6	93.4	90.1		1.27
	Boron	98.7	98.8	99.5	97.9		0.598
	Cadmium	96.7	101	101	98.7		0.105
	Chromium	97.5	99.0	99.5	99.4		0.471
	Cobalt	99.1	97.1	96.7	95.4		0.434
	Copper	97.7	93.4	93.7	93.8		0.371
	Lead	98.4	97.8	98.4	98.6		0.658
	Manganese	98.3	98.8	100	99.4		1.66
	Molybdenum	98.9	101	103	102		1.35
	Nickel	98.9	97.3	97.0	96.0		0.322
	Selenium	99.5	97.3	97.5	95.6		0.205
	Silver	96.6	96.0	97.5	94.8		1.51
	Thallium	101	103	103	104		0.293
EPA 300.0 Rev. 2.1	Chloride	101	101	101		0.756	
	Sulfate	98.9	94.6	93.9		0.471	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	102	105			1.91
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					0.590
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	95.4	95.9			0.501
EPA 365.1 Rev. 2.0	Total-P	98.6	103	103			0.408
SM 2320 B-2011	Total Alkalinity	98.3				1.45	
SM 2540 C-2011	TDS					2.92	
SM 4500-F- C-2011	Fluoride	98.7	100	99.2			0.480
SM 5310 B-2011	Organic Carbon	96.8	96.0	98.2			1.63

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2323386
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2323386
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2323392
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2323392
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2323386
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2323386
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2323387
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2323387

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2323387
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2323387
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2323386
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2323392
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2323386
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2323386
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2323386
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2323387

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	05/03/2022			05/03/2022 15:38	Samantha L Bates	2323386
EPA 180.1 Rev. 2.0	05/03/2022			05/03/2022 14:32	Khloe J Berg	2323386
EPA 200.7 Rev. 4.4	05/03/2022	05/05/2022 10:30	Megan Whitefoot	05/06/2022 15:50	McKinley C Carter	2323392
EPA 200.8 Rev. 5.4	05/03/2022	05/05/2022 10:30	Megan Whitefoot	05/05/2022 18:14	Alexander Thompson	2323392
EPA 300.0 Rev. 2.1	05/03/2022			05/12/2022 20:09	Anna M. Plaviak	2323386
EPA 350.1 Rev. 2.0	05/03/2022			05/05/2022 16:15	Judith K. Clark	2323387
EPA 351.2 Rev. 2.0	05/03/2022	05/11/2022 15:45	Samantha L Bates	05/12/2022 15:43	Alexandra J Mattheus	2323387
EPA 353.2 Rev. 2.0	05/03/2022			05/06/2022 09:54	Beverly Y. Sanders	2323387
EPA 365.1 Rev. 2.0	05/03/2022	05/09/2022 14:45	Simonne.V. Calhoun	05/10/2022 12:41	Sarah A Nixon	2323387
SM 2320 B-2011	05/03/2022			05/05/2022 03:01	Dale L. Simmons	2323386
SM 2340 B-2011	05/03/2022			05/06/2022 15:50	McKinley C Carter	2323392
SM 2540 C-2011	05/03/2022			05/05/2022 14:39	Yijie Li	2323386
SM 2540 D-2011	05/03/2022			05/05/2022 14:39	Yijie Li	2323386
SM 4500-F- C-2011	05/03/2022			05/05/2022 03:01	Dale L. Simmons	2323386
SM 5310 B-2011	05/03/2022			05/12/2022 20:17	Judith K. Clark	2323387