

Chemical Analysis Report

CEN-DIST-2023-03-02-01

Florida DEP Laboratory
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DOH Accreditation E31780

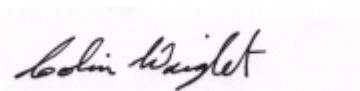
Event Description: **Run 3**
Request ID: **RQ-2023-02-27-18**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-MAR-2023 11:47

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored background.

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: Cow Creek at Osteen-Maytown Road

Collection Date/Time: 03/01/2023 11:06

Field ID: G2CE0086

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391332	EPA 200.7 Rev. 4.4	Calcium	5.32		mg/L	P426646	
		Iron	1.13E+03		ug/L	P426646	
		Magnesium	1.41		mg/L	P426646	
		Potassium	0.30	U	mg/L	P426646	
		Sodium	9.1		mg/L	P426646	
		Strontium	28.0		ug/L	P426646	
		Tin	3.0	U	ug/L	P426646	
		Titanium	1.5	I	ug/L	P426646	
		Vanadium	2.0	U	ug/L	P426646	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P426646	
		Aluminum	230		ug/L	P426646	
		Antimony	0.050	U	ug/L	P426646	
		Arsenic	0.34		ug/L	P426646	
		Barium	8.13		ug/L	P426646	
		Beryllium	0.012	I	ug/L	P426646	
		Boron	20.0		ug/L	P426646	
		Cadmium	0.020	U	ug/L	P426646	
		Chromium	0.40	U	ug/L	P426646	
		Cobalt	0.119		ug/L	P426646	
		Copper	0.40	U	ug/L	P426646	
		Lead	0.57		ug/L	P426646	
		Manganese	9.99		ug/L	P426646	
		Molybdenum	0.15	U	ug/L	P426646	
		Nickel	0.50	U	ug/L	P426646	
		Selenium	0.20	U	ug/L	P426646	
		Silver	0.010	U	ug/L	P426646	
		Thallium	0.10	U	ug/L	P426646	
	SM 2340 B-2011	Hardness	19.1		mg/L	P426646	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/07/2023.

Sample Location: Addison Creek @ US1

Collection Date/Time: 03/01/2023 12:33

Field ID: G5CE0111

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391323	DEP SOP: NU-094-1	Color (true)	54		PCU	P426623	
	EPA 180.1 Rev. 2.0	Turbidity	20		NTU	P426625	
	EPA 300.0 Rev. 2.1	Chloride	370		mg Cl/L	P427039	
		Sulfate	93		mg SO4/L	P427043	
	SM 2320 B-2011	Total Alkalinity	167		mg CaCO3/L	P427035	
	SM 2540 C-2015	TDS	966		mg/L	P427176	
	SM 2540 D-2015	TSS	5	I	mg/L	P426964	
	SM 4500-F- C-2011	Fluoride	0.084	I	mg F/L	P427162	
2391324	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P426732	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P426908	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P426859	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P426839	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P426935	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Unnamed Slough @ Zoltan Drive

Collection Date/Time: 03/01/2023 12:02

Field ID: G3CE0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391321	DEP SOP: NU-094-1	Color (true)	56		PCU	P426623	
	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P426625	
	EPA 300.0 Rev. 2.1	Chloride	93		mg Cl/L	P427000	
		Sulfate	48		mg SO4/L	P427003	
	SM 2320 B-2011	Total Alkalinity	130		mg CaCO3/L	P426900	
	SM 2540 C-2015	TDS	365		mg/L	P427176	
	SM 2540 D-2015	TSS	18		mg/L	P426964	
	SM 4500-F- C-2011	Fluoride	0.048	I	mg F/L	P426903	MS
2391322	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P426732	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P426908	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P426859	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P426839	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P426935	
2391331	EPA 200.7 Rev. 4.4	Calcium	68.8		mg/L	P426646	
		Iron	2.45E+03		ug/L	P426646	
		Magnesium	7.66		mg/L	P426646	
		Potassium	4.3		mg/L	P426646	
		Sodium	59.0		mg/L	P426646	
		Strontium	579		ug/L	P426646	
		Tin	3.0	U	ug/L	P426646	
	EPA 200.8 Rev. 5.4	Titanium	3.4		ug/L	P426646	
		Vanadium	4.6	I	ug/L	P426646	
		Zinc	5.0	U	ug/L	P426646	
		Aluminum	333		ug/L	P426646	
		Antimony	0.20		ug/L	P426646	
		Arsenic	4.16		ug/L	P426646	
		Barium	16.1		ug/L	P426646	
		Beryllium	0.042		ug/L	P426646	
		Boron	76.5		ug/L	P426646	
		Cadmium	0.020	U	ug/L	P426646	
		Chromium	1.0	I	ug/L	P426646	
		Cobalt	0.110		ug/L	P426646	
		Copper	1.07		ug/L	P426646	
		Lead	1.00		ug/L	P426646	
		Manganese	14.6		ug/L	P426646	
		Molybdenum	1.80		ug/L	P426646	
		Nickel	0.58	I	ug/L	P426646	
		Selenium	0.20	U	ug/L	P426646	
		Silver	0.010	U	ug/L	P426646	
		Thallium	0.10	U	ug/L	P426646	
	SM 2340 B-2011	Hardness	203		mg/L	P426646	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P426623

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426625

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426646

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: P426646

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: P427000

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: P427003

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427039

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427043

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426732

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426908

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426859

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426839

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

Reference Method: SM 2320 B-2011
Batch ID: P426900

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

Reference Method: SM 2320 B-2011
Batch ID: P427035

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-2015
Batch ID: P427176

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P426964

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P426903

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P426935

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: P426623

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426625

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	110		P	85 - 115
Iron	109		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	105		P	85 - 115
Sodium	106		P	85 - 115
Strontium	102		P	85 - 115
Tin	104		P	85 - 115
Titanium	106		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.9		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Barium	103		P	85 - 115
Beryllium	99.6		P	85 - 115
Boron	101		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	100		P	85 - 115
Copper	100		P	85 - 115
Lead	99.2		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	102		P	85 - 115
Selenium	105		P	85 - 115
Silver	100		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427000

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: P427003

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427039

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427043

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426732

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426908

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: P426859

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426839

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.3		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P426900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	94.8		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P427035

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.1		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 C-2015
Batch ID: P427176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	95.1		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P426964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	99.5		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P426903

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	103		P	96 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426935

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: P426646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2390788	Calcium	109		P	80 - 120
2390788	Iron	105	112	P/P	80 - 120
2390788	Magnesium	110		P	80 - 120
2390788	Potassium	98.2	104	P/P	80 - 120
2390788	Sodium	99.9	110	P/P	80 - 120
2390788	Strontium	98.7	105	P/P	80 - 120
2390788	Tin	101	105	P/P	80 - 120
2390788	Titanium	105	110	P/P	80 - 120
2390788	Vanadium	101	106	P/P	80 - 120
2390788	Zinc	97.3	102	P/P	80 - 120
2391077	Calcium	112		P	80 - 120
2391077	Iron	113		P	80 - 120
2391077	Magnesium	118		P	80 - 120
2391077	Potassium	108		P	80 - 120
2391077	Sodium	107		P	80 - 120
2391077	Strontium	107		P	80 - 120
2391077	Tin	106		P	80 - 120
2391077	Titanium	106		P	80 - 120
2391077	Vanadium	105		P	80 - 120
2391077	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P426646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2390788	Aluminum	101	100	P/P	80 - 120
2390788	Antimony	104	105	P/P	80 - 120
2390788	Arsenic	105	105	P/P	80 - 120
2390788	Barium	104	105	P/P	80 - 120
2390788	Beryllium	99.2	99.2	P/P	80 - 120
2390788	Boron	102	102	P/P	80 - 120
2390788	Cadmium	105	105	P/P	80 - 120
2390788	Chromium	102	102	P/P	80 - 120
2390788	Cobalt	100	99.3	P/P	80 - 120
2390788	Copper	98.7	99.2	P/P	80 - 120
2390788	Lead	99.7	100	P/P	80 - 120
2390788	Manganese	104	103	P/P	80 - 120
2390788	Molybdenum	102	103	P/P	80 - 120
2390788	Nickel	101	101	P/P	80 - 120
2390788	Selenium	105	105	P/P	80 - 120
2390788	Silver	101	102	P/P	80 - 120
2390788	Thallium	102	105	P/P	80 - 120
2391077	Aluminum	99.7		P	80 - 120
2391077	Antimony	102		P	80 - 120
2391077	Arsenic	103		P	80 - 120
2391077	Barium	104		P	80 - 120
2391077	Beryllium	96.8		P	80 - 120
2391077	Boron	101		P	80 - 120
2391077	Cadmium	105		P	80 - 120
2391077	Chromium	102		P	80 - 120
2391077	Cobalt	99.9		P	80 - 120
2391077	Copper	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391077	Lead	101		P	80 - 120
2391077	Manganese	104		P	80 - 120
2391077	Molybdenum	99.6		P	80 - 120
2391077	Nickel	101		P	80 - 120
2391077	Selenium	106		P	80 - 120
2391077	Silver	99.9		P	80 - 120
2391077	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427000

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391219	Chloride	95.8		P	90 - 110
2391259	Chloride	96.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427003

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391219	Sulfate	100		P	90 - 110
2391259	Sulfate	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391337	Chloride	97.0		P	90 - 110
2391346	Chloride	95.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391337	Sulfate	96.1		P	90 - 110
2391346	Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426732

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391231	Ammonia-N	97.4	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426908

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391265	Kjeldahl Nitrogen	94.7	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391322	NO2NO3-N	99.8	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391264	Total-P	101	98.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P426903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391088	Fluoride	105	104	F/P	94 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392889	Fluoride	100	101	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391264	Organic Carbon	96.4	97.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P426623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391058	Color (true)	0.808	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426625

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391172	Turbidity	3.73	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390788	Calcium	5.70	Spike	P	0 - 20
2390788	Iron	5.97	Spike	P	0 - 20
2390788	Magnesium	5.95	Spike	P	0 - 20
2390788	Potassium	5.53	Spike	P	0 - 20
2390788	Sodium	5.29	Spike	P	0 - 20
2390788	Strontium	6.01	Spike	P	0 - 20
2390788	Tin	4.55	Spike	P	0 - 20
2390788	Titanium	4.07	Spike	P	0 - 20
2390788	Vanadium	4.69	Spike	P	0 - 20
2390788	Zinc	3.80	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390788	Aluminum	0.178	Spike	P	0 - 20
2390788	Antimony	1.54	Spike	P	0 - 20
2390788	Arsenic	0.490	Spike	P	0 - 20
2390788	Barium	1.16	Spike	P	0 - 20
2390788	Beryllium	0.0194	Spike	P	0 - 20
2390788	Boron	0.0690	Spike	P	0 - 20
2390788	Cadmium	0.0892	Spike	P	0 - 20
2390788	Chromium	0.0778	Spike	P	0 - 20
2390788	Cobalt	0.991	Spike	P	0 - 20
2390788	Copper	0.496	Spike	P	0 - 20
2390788	Lead	0.738	Spike	P	0 - 20
2390788	Manganese	0.603	Spike	P	0 - 20
2390788	Molybdenum	0.700	Spike	P	0 - 20
2390788	Nickel	0.0782	Spike	P	0 - 20
2390788	Selenium	0.299	Spike	P	0 - 20
2390788	Silver	0.928	Spike	P	0 - 20
2390788	Thallium	2.25	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427000

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391219	Chloride	2.19	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391337	Chloride	0.715	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391337	Sulfate	1.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391231	Ammonia-N	0.193	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391265	Kjeldahl Nitrogen	4.16	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391322	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391264	Total-P	2.70	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P426900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391088	Total Alkalinity	0.711	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P427035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392889	Total Alkalinity	0.840	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P427176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390616	TDS	3.04	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P426903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391088	Fluoride	0.979	Spike	P	0 - 1.6

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392889	Fluoride	0.467	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P426935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391264	Organic Carbon	0.394	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A117767

Included Lab Sample IDs: 2391321, 2391323

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A117768

Included Lab Sample IDs: 2391321, 2391323

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A117821

Included Lab Sample IDs: 2391322, 2391324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	99.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A117833

Included Lab Sample IDs: 2391321, 2391323

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	95.5	P/P	90 - 110
Chloride	99.6	97.7	P/P	90 - 110
Sulfate	100	98.7	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117841

Included Lab Sample IDs: 2391331, 2391332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	104	P/P	90 - 110
Antimony	102	104	P/P	90 - 110
Arsenic	103	104	P/P	90 - 110
Barium	102	104	P/P	90 - 110
Beryllium	103	104	P/P	90 - 110
Boron	97.6	101	P/P	90 - 110
Cadmium	103	104	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Cobalt	99.4	100	P/P	90 - 110
Copper	99.2	100	P/P	90 - 110
Lead	97.8	99.6	P/P	90 - 110
Manganese	104	103	P/P	90 - 110
Molybdenum	99.4	99.8	P/P	90 - 110
Nickel	100	101	P/P	90 - 110
Selenium	107	108	P/P	90 - 110
Silver	100	100	P/P	90 - 110
Thallium	99.8	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A117872

Included Lab Sample IDs: 2391322, 2391324

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

Reference Method: SM 2320 B-2011

Run ID: A117887

Included Lab Sample IDs: 2391321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.6	94.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A117887

Included Lab Sample IDs: 2391321

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A117892

Included Lab Sample IDs: 2391322, 2391324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.6	96.0	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A117898

Included Lab Sample IDs: 2391322, 2391324

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

Reference Method: SM 2320 B-2011

Run ID: A117948

Included Lab Sample IDs: 2391323

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.8	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A117978

Included Lab Sample IDs: 2391322, 2391324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	99.6	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A117988

Included Lab Sample IDs: 2391323

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118045

Included Lab Sample IDs: 2391331, 2391332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	105	P/P	90 - 110
Iron	102	106	P/P	90 - 110
Magnesium	103	106	P/P	90 - 110
Potassium	101	104	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Strontium	98.6	98.4	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	99.5	100	P/P	90 - 110
Zinc	96.6	95.8	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)	98.9				0.808	
EPA 180.1 Rev. 2.0	Turbidity	100				3.73	
EPA 200.7 Rev. 4.4	Calcium	110	109	112			5.70
	Iron	109	105	112	113		5.97
	Magnesium	110	110	118			5.95
	Potassium	105	98.2	104	108		5.53
	Sodium	106	99.9	110	107		5.29
	Strontium	102	98.7	105	107		6.01
	Tin	104	101	105	106		4.55
	Titanium	106	105	110	106		4.07
	Vanadium	102	101	106	105		4.69
	Zinc	102	97.3	102	101		3.80
EPA 200.8 Rev. 5.4	Aluminum	99.9	101	100	99.7		0.178
	Antimony	102	104	105	102		1.54
	Arsenic	102	105	105	103		0.490
	Barium	103	104	105	104		1.16
	Beryllium	99.6	99.2	99.2	96.8		0.0194
	Boron	101	102	102	101		0.0690
	Cadmium	104	105	105	105		0.0892
	Chromium	100	102	102	102		0.0778
	Cobalt	100	100	99.3	99.9		0.991
	Copper	100	98.7	99.2	101		0.496
	Lead	99.2	99.7	100	101		0.738
	Manganese	102	104	103	104		0.603
	Molybdenum	101	102	103	99.6		0.700
	Nickel	102	101	101	101		0.0782
	Selenium	105	105	105	106		0.299
	Silver	100	101	102	99.9		0.928
	Thallium	102	102	105	103		2.25
EPA 300.0 Rev. 2.1	Chloride	101	95.8	96.2		2.19	
	Chloride	97.2	97.0	95.8		0.715	
	Sulfate	104	100	101			
	Sulfate	101	96.1	98.6		1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	97.4	97.2			0.193
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	94.7	100			4.16
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.8	99.8			0.0
EPA 365.1 Rev. 2.0	Total-P	98.3	101	98.0			2.70
SM 2320 B-2011	Total Alkalinity	94.8				0.711	
	Total Alkalinity	95.1				0.840	
SM 2540 C-2015	TDS	95.1				3.04	
SM 2540 D-2015	TSS	99.5					
SM 4500-F- C-2011	Fluoride	103	105	104			0.979
	Fluoride	99.8	100	101			0.467
SM 5310 B-2011	Organic Carbon	96.8	96.4	97.0			0.394

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2391321, 2391323
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2391321, 2391323
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2391331, 2391332

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2391331, 2391332
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2391321, 2391323
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2391321, 2391323
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2391322, 2391324
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2391322, 2391324
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2391322, 2391324
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2391322, 2391324
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2391321, 2391323
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2391331, 2391332
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2391321, 2391323
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2391321, 2391323
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2391321, 2391323
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2391322, 2391324

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	03/02/2023			03/02/2023 15:40	Alexis Price	2391321, 2391323
EPA 180.1 Rev. 2.0	03/02/2023			03/02/2023 14:43	Chandler E Cox	2391321
	03/02/2023			03/02/2023 14:44	Chandler E Cox	2391323
EPA 200.7 Rev. 4.4	03/02/2023	03/03/2023 13:20	George D Taylor	03/16/2023 17:06	Chase Roberts	2391331
	03/02/2023	03/03/2023 13:20	George D Taylor	03/16/2023 17:13	Chase Roberts	2391332
EPA 200.8 Rev. 5.4	03/02/2023	03/03/2023 13:20	George D Taylor	03/06/2023 19:23	Emily M Philpot	2391331
	03/02/2023	03/03/2023 13:20	George D Taylor	03/06/2023 19:31	Emily M Philpot	2391332
EPA 300.0 Rev. 2.1	03/02/2023			03/10/2023 08:52	Judith K. Clark	2391321
	03/02/2023			03/10/2023 14:46	Judith K. Clark	2391323
EPA 350.1 Rev. 2.0	03/02/2023			03/06/2023 12:33	Khloe J Berg	2391322
	03/02/2023			03/06/2023 12:34	Khloe J Berg	2391324
EPA 351.2 Rev. 2.0	03/02/2023	03/09/2023 14:00	Simonne.V. Calhoun	03/14/2023 12:28	Samantha L Bates	2391322
	03/02/2023	03/09/2023 14:00	Simonne.V. Calhoun	03/14/2023 12:30	Samantha L Bates	2391324
EPA 353.2 Rev. 2.0	03/02/2023			03/08/2023 10:37	Beverly Y. Sanders	2391322
	03/02/2023			03/08/2023 10:43	Beverly Y. Sanders	2391324
EPA 365.1 Rev. 2.0	03/02/2023	03/08/2023 02:00	Alexis Price	03/09/2023 10:37	James L Waggeberby	2391322
	03/02/2023	03/08/2023 02:00	Alexis Price	03/09/2023 10:38	James L Waggeberby	2391324
SM 2320 B-2011	03/02/2023			03/09/2023 02:21	Adam P Silver	2391321
	03/02/2023			03/11/2023 11:48	Dale L. Simmons	2391323
SM 2340 B-2011	03/02/2023			03/16/2023 17:06	Chase Roberts	2391331
	03/02/2023			03/16/2023 17:13	Chase Roberts	2391332
SM 2540 C-2015	03/02/2023			03/03/2023 15:41	Yijie Li	2391321, 2391323
SM 2540 D-2015	03/02/2023			03/03/2023 15:41	Yijie Li	2391321, 2391323
SM 4500-F- C-2011	03/02/2023			03/09/2023 02:21	Adam P Silver	2391321
	03/02/2023			03/15/2023 00:01	Dale L. Simmons	2391323
SM 5310 B-2011	03/02/2023			03/08/2023 23:11	Khloe J Berg	2391322
	03/02/2023			03/08/2023 23:26	Khloe J Berg	2391324