Chemical Analysis Report

SE-DIST-2023-02-14-02

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **SMP - G2SE0077 recovery**
Request ID: **RQ-2023-02-13-50**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Colin Wright, Program Administrator

Date Certified: 09-MAR-2023 10:03

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: St. Lucie Canal near I-95 **Collection Date/Time: 02/13/2023 14:00**

Field ID: G2SE0077 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2387014	DEP SOP: NU-094-1	Color (true)	42		PCU	P425791	
	EPA 180.1 Rev. 2.0	Turbidity	28		NTU	P425794	
	EPA 300.0 Rev. 2.1	Chloride	88		mg Cl/L	P426336	
		Sulfate	31		mg SO4/L	P426339	
	SM 2320 B-2011	Total Alkalinity	130		mg CaCO3/L	P426063	
	SM 2540 C-2015	TDS	348		mg/L	P426459	
	SM 2540 D-2015	TSS	24		mg/L	P426313	
	SM 4500-F- C-2011	Fluoride	0.20		mg F/L	P426065	
2387015	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P426176	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P425913	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.42		mg N/L	P425944	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P425932	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P426023	
2387023	EPA 200.7 Rev. 4.4	Calcium	54.8		mg/L	P425970	
		Iron	1.52E+03		ug/L	P425970	
		Magnesium	11.9		mg/L	P425970	
		Potassium	5.5		mg/L	P425970	
		Sodium	43.1		mg/L	P425970	
		Strontium	691		ug/L	P425970	
		Tin	3.0	U	ug/L	P425970	
		Titanium	27.6		ug/L	P425970	
		Vanadium	3.3	I	ug/L	P425970	
		Zinc	5.0	U	ug/L	P425970	
	EPA 200.8 Rev. 5.4	Aluminum	755		ug/L	P425970	
		Antimony	0.12	I	ug/L	P425970	
		Arsenic	1.48		ug/L	P425970	
		Barium	28.4		ug/L	P425970	
		Beryllium	0.060		ug/L	P425970	
		Boron	61.5		ug/L	P425970	
		Cadmium	0.020	U	ug/L	P425970	
		Chromium	1.6		ug/L	P425970	
		Cobalt	0.261		ug/L	P425970	
		Copper	2.34		ug/L	P425970	
		Lead	1.03		ug/L	P425970	
		Manganese	24.9		ug/L	P425970	
		Molybdenum	1.12		ug/L	P425970	
		Nickel	0.95	I	ug/L	P425970	
		Selenium	0.27	I	ug/L	P425970	
		Silver	0.010	U	ug/L	P426231	
		Thallium	0.10	U	ug/L	P425970	
	SM 2340 B-2011	Hardness	186		mg/L	P425970	

Ref. Method and Comment:
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: P425791

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P425794

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425970

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: P425970

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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426231

Component	Result	Code	Units
Silver	0.010	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426336

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426339

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426176

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425913

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425944

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425932

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

Reference Method: SM 2320 B-2011
Batch ID: P426063

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

Reference Method: SM 2540 C-2015
Batch ID: P426459

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P426313

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P426065

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P426023

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: P425791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P425794

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	102		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	95.2		P	85 - 115
Sodium	98.5		P	85 - 115
Strontium	99.6		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	99.9		P	85 - 115
Barium	101		P	85 - 115
Beryllium	97.5		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	102		P	85 - 115
Copper	99.9		P	85 - 115
Lead	100		P	85 - 115
Manganese	98.9		P	85 - 115
Molybdenum	98.9		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.4		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	97.5		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426336

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426339

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425913

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: P425944

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: P425932

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

Reference Method: SM 2320 B-2011
Batch ID: P426063

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	94.2		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P426459

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	106		P	89 - 110

Reference Method: SM 2540 D-2015
Batch ID: P426313

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	94.3		P	85 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P426065

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

Reference Method: SM 5310 B-2011
Batch ID: P426023

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386597	Calcium	97.2		P	80 - 120
2386597	Iron	101	99.1	P/P	80 - 120
2386597	Magnesium	97.0		P	80 - 120
2386597	Potassium	92.6	91.5	P/P	80 - 120
2386597	Sodium	98.3		P	80 - 120
2386597	Strontium	97.5	97.9	P/P	80 - 120
2386597	Tin	102	101	P/P	80 - 120
2386597	Titanium	101	102	P/P	80 - 120
2386597	Vanadium	101	101	P/P	80 - 120
2386597	Zinc	104	104	P/P	80 - 120
2387854	Calcium	103		P	80 - 120
2387854	Iron	102		P	80 - 120
2387854	Magnesium	101		P	80 - 120
2387854	Potassium	101		P	80 - 120
2387854	Sodium	101		P	80 - 120
2387854	Strontium	98.5		P	80 - 120
2387854	Tin	101		P	80 - 120
2387854	Titanium	100		P	80 - 120
2387854	Vanadium	101		P	80 - 120
2387854	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386597	Aluminum	98.6	98.5	P/P	80 - 120
2386597	Antimony	103	103	P/P	80 - 120
2386597	Arsenic	99.4	98.7	P/P	80 - 120
2386597	Barium	101	100	P/P	80 - 120
2386597	Beryllium	97.3	97.4	P/P	80 - 120
2386597	Boron	101	102	P/P	80 - 120
2386597	Cadmium	101	100	P/P	80 - 120
2386597	Chromium	103	103	P/P	80 - 120
2386597	Cobalt	99.9	98.9	P/P	80 - 120
2386597	Copper	95.6	95.3	P/P	80 - 120
2386597	Lead	101	99.6	P/P	80 - 120
2386597	Manganese	102	101	P/P	80 - 120
2386597	Molybdenum	101	99.6	P/P	80 - 120
2386597	Nickel	100	101	P/P	80 - 120
2386597	Selenium	93.6	93.3	P/P	80 - 120
2386597	Thallium	103	102	P/P	80 - 120
2387854	Aluminum	98.6		P	80 - 120
2387854	Antimony	103		P	80 - 120
2387854	Arsenic	99.5		P	80 - 120
2387854	Barium	101		P	80 - 120
2387854	Beryllium	94.7		P	80 - 120
2387854	Boron	103		P	80 - 120
2387854	Cadmium	100		P	80 - 120
2387854	Chromium	101		P	80 - 120
2387854	Cobalt	99.0		P	80 - 120
2387854	Copper	97.5		P	80 - 120
2387854	Lead	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387854	Manganese	99.1		P	80 - 120
2387854	Molybdenum	99.5		P	80 - 120
2387854	Nickel	99.7		P	80 - 120
2387854	Selenium	97.5		P	80 - 120
2387854	Thallium	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386816	Silver	98.3	98.3	P/P	80 - 120
2387854	Silver	98.7		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386877	Chloride	104		P	90 - 110
2387009	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386877	Sulfate	94.3		P	90 - 110
2387009	Sulfate	109		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426176

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386838	Ammonia-N	97.8	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386921	Kjeldahl Nitrogen	92.3	114	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2386921	NO2NO3-N	94.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387087	Total-P	103	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P426065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387009	Fluoride	101	101	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387115	Organic Carbon	95.0	96.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P425791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387284	Color (true)	0.838	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P425794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387057	Turbidity	0.518	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386597	Calcium	0.345	Spike	P	0 - 20
2386597	Iron	1.46	Spike	P	0 - 20
2386597	Magnesium	1.68	Spike	P	0 - 20
2386597	Potassium	1.03	Spike	P	0 - 20
2386597	Sodium	0.0337	Spike	P	0 - 20
2386597	Strontium	0.329	Spike	P	0 - 20
2386597	Tin	0.777	Spike	P	0 - 20
2386597	Titanium	0.149	Spike	P	0 - 20
2386597	Vanadium	0.323	Spike	P	0 - 20
2386597	Zinc	0.263	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386597	Aluminum	0.0930	Spike	P	0 - 20
2386597	Antimony	0.0664	Spike	P	0 - 20
2386597	Arsenic	0.691	Spike	P	0 - 20
2386597	Barium	0.754	Spike	P	0 - 20
2386597	Beryllium	0.0848	Spike	P	0 - 20
2386597	Boron	0.569	Spike	P	0 - 20
2386597	Cadmium	1.32	Spike	P	0 - 20
2386597	Chromium	0.149	Spike	P	0 - 20
2386597	Cobalt	0.978	Spike	P	0 - 20
2386597	Copper	0.405	Spike	P	0 - 20
2386597	Lead	1.28	Spike	P	0 - 20
2386597	Manganese	0.952	Spike	P	0 - 20
2386597	Molybdenum	1.09	Spike	P	0 - 20
2386597	Nickel	0.696	Spike	P	0 - 20
2386597	Selenium	0.358	Spike	P	0 - 20
2386597	Thallium	0.876	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386816	Silver	0.0528	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386877	Chloride	1.94	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386877	Sulfate	3.03	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386838	Ammonia-N	0.821	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386921	Kjeldahl Nitrogen	12.6	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386921	NO2NO3-N	0.380	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387087	Total-P	0.0462	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P426063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387009	Total Alkalinity	0.478	Sample	P	0 - 3.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2015
Batch ID: P426459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2386878	TDS	7.32	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P426065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387009	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P426023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387115	Organic Carbon	0.834	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: A117436
Included Lab Sample IDs: 2387014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.0	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A117437
Included Lab Sample IDs: 2387014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117480
Included Lab Sample IDs: 2387015

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

Reference Method: SM 5310 B-2011
Run ID: A117520
Included Lab Sample IDs: 2387015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.1	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A117531
Included Lab Sample IDs: 2387014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.6	95.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117531
Included Lab Sample IDs: 2387014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117557
Included Lab Sample IDs: 2387023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.8	99.0	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	98.8	98.3	P/P	90 - 110
Barium	99.2	100	P/P	90 - 110
Beryllium	98.6	96.4	P/P	90 - 110
Boron	97.6	96.8	P/P	90 - 110
Cadmium	99.3	99.3	P/P	90 - 110
Chromium	101	99.9	P/P	90 - 110
Cobalt	98.9	97.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117557
Included Lab Sample IDs: 2387023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	96.8	96.1	P/P	90 - 110
Lead	99.7	99.9	P/P	90 - 110
Manganese	101	100	P/P	90 - 110
Molybdenum	98.0	98.2	P/P	90 - 110
Nickel	98.5	97.0	P/P	90 - 110
Selenium	99.5	98.9	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117566
Included Lab Sample IDs: 2387015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.2	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117572
Included Lab Sample IDs: 2387015

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A117607
Included Lab Sample IDs: 2387014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	105	102	P/P	90 - 110
Sulfate	108	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A117613
Included Lab Sample IDs: 2387023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.5	P/P	90 - 110
Iron	99.7	98.4	P/P	90 - 110
Magnesium	100	98.5	P/P	90 - 110
Potassium	98.4	97.0	P/P	90 - 110
Sodium	99.4	97.3	P/P	90 - 110
Strontium	99.9	100	P/P	90 - 110
Tin	102	99.5	P/P	90 - 110
Titanium	99.9	98.4	P/P	90 - 110
Vanadium	100	98.9	P/P	90 - 110
Zinc	106	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117625
Included Lab Sample IDs: 2387015

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117625
Included Lab Sample IDs: 2387015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117640
Included Lab Sample IDs: 2387023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	95.6	96.7	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
DEP SOP: NU-094-1	Color (true)	103					0.838	
EPA 180.1 Rev. 2.0	Turbidity	102					0.518	
EPA 200.7 Rev. 4.4	Calcium	100	97.2	103				0.345
	Iron	102	101	99.1	102			1.46
	Magnesium	100	97.0	101				1.68
	Potassium	95.2	92.6	91.5	101			1.03
	Sodium	98.5	98.3	101				0.0337
	Strontium	99.6	97.5	97.9	98.5			0.329
	Tin	104	102	101	101			0.777
	Titanium	103	101	102	100			0.149
	Vanadium	101	101	101	101			0.323
	Zinc	107	104	104	108			0.263
EPA 200.8 Rev. 5.4	Aluminum	100	98.6	98.5	98.6			0.0930
	Antimony	101	103	103	103			0.0664
	Arsenic	99.9	99.4	98.7	99.5			0.691
	Barium	101	101	100	101			0.754
	Beryllium	97.5	97.3	97.4	94.7			0.0848
	Boron	98.6	101	102	103			0.569
	Cadmium	99.2	101	100	100			1.32
	Chromium	102	103	103	101			0.149
	Cobalt	102	99.0	99.9	98.9			0.978
	Copper	99.9	95.6	95.3	97.5			0.405
	Lead	100	101	99.6	101			1.28
	Manganese	98.9	102	101	99.1			0.952
	Molybdenum	98.9	101	99.6	99.5			1.09
	Nickel	103	100	101	99.7			0.696
	Selenium	99.4	93.6	93.3	97.5			0.358
	Silver	97.5	98.3	98.3	98.7			0.0528
	Thallium	102	103	102	104			0.876
EPA 300.0 Rev. 2.1	Chloride	101	104	105			1.94	
	Sulfate	105	94.3	109			3.03	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	97.8	97.0				0.821
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	92.3	114				12.6
EPA 353.2 Rev. 2.0	NO2NO3-N	102	94.2					0.380
EPA 365.1 Rev. 2.0	Total-P	104	103	103				0.0462
SM 2320 B-2011	Total Alkalinity	94.2					0.478	
SM 2540 C-2015	TDS	106					7.32	
SM 2540 D-2015	TSS	94.3						
SM 4500-F- C-2011	Fluoride	99.8	101	101				0.0
SM 5310 B-2011	Organic Carbon	94.3	95.0	96.1				0.834

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2387014
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2387014
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2387023
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2387023
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2387014
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2387014
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2387015

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2387015
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2387015
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2387015
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2387014
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2387023
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2387014
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2387014
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2387014
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2387015

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	02/14/2023			02/14/2023 16:01	Alexis Price	2387014
EPA 180.1 Rev. 2.0	02/14/2023			02/14/2023 14:55	Anna M. Plaviak	2387014
EPA 200.7 Rev. 4.4	02/14/2023	02/17/2023 10:50	George D Taylor	02/22/2023 14:05	McKinley C Carter	2387023
EPA 200.8 Rev. 5.4	02/14/2023	02/17/2023 10:50	George D Taylor	02/20/2023 18:33	Conrad Hartmann	2387023
	02/14/2023	02/22/2023 13:20	George D Taylor	02/23/2023 14:45	Conrad Hartmann	2387023
EPA 300.0 Rev. 2.1	02/14/2023			02/24/2023 00:46	Anna M. Plaviak	2387014
EPA 350.1 Rev. 2.0	02/14/2023			02/21/2023 12:54	Ping Hua	2387015
EPA 351.2 Rev. 2.0	02/14/2023	02/16/2023 11:30	Simonne.V. Calhoun	02/23/2023 11:56	Judith K. Clark	2387015
EPA 353.2 Rev. 2.0	02/14/2023			02/16/2023 10:43	Beverly Y. Sanders	2387015
EPA 365.1 Rev. 2.0	02/14/2023	02/16/2023 16:29	Adam P Silver	02/17/2023 10:09	James L Waggerby	2387015
SM 2320 B-2011	02/14/2023			02/17/2023 22:50	Dale L. Simmons	2387014
SM 2340 B-2011	02/14/2023			02/22/2023 14:05	McKinley C Carter	2387023
SM 2540 C-2015	02/14/2023			02/17/2023 15:46	Yijie Li	2387014
SM 2540 D-2015	02/14/2023			02/17/2023 15:46	Yijie Li	2387014
SM 4500-F- C-2011	02/14/2023			02/17/2023 22:50	Dale L. Simmons	2387014
SM 5310 B-2011	02/14/2023			02/17/2023 05:23	Elise M. Gillis	2387015