Chemical Analysis Report

SO-DIST-2023-03-02-02

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

Event Description: **2023 SMP: Continuous Deploy**
Request ID: **RQ-2023-02-27-11**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
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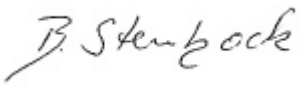
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 24-MAR-2023 16:23



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: YuccaFlatwoods Mid **Collection Date/Time: 03/01/2023 09:25**

Field ID: G2SD0052 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391198	EPA 180.1 Rev. 2.0	Turbidity	7.8		NTU	P426625	
	SM 2320 B-2011	Total Alkalinity	149		mg CaCO3/L	P426973	
	SM 2540 D-2015	TSS	19		mg/L	P426967	
	SM 4500-F- C-2011	Fluoride	1.2		mg F/L	P426974	
2391199	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P426793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P426850	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P426668	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P426888	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P426797	

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: CLEVELAND CEMETARY DITCH @ RIVERSIDE RD **Collection Date/Time: 03/01/2023 10:30**

Field ID: G3SD0076 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391200	EPA 180.1 Rev. 2.0	Turbidity	55		NTU	P426625	
	SM 2320 B-2011	Total Alkalinity	270		mg CaCO3/L	P426973	
	SM 2540 D-2015	TSS	33		mg/L	P426967	
	SM 4500-F- C-2011	Fluoride	0.19		mg F/L	P427162	
2391201	EPA 350.1 Rev. 2.0	Ammonia-N	0.82		mg N/L	P426793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P426850	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.62		mg N/L	P426668	
	EPA 365.1 Rev. 2.0	Total-P	0.44		mg P/L	P426888	
	SM 5310 B-2011	Organic Carbon	23		mg C/L	P426797	
2391206	EPA 200.7 Rev. 4.4	Calcium	148		mg/L	P426978	
		Iron	2.58E+03		ug/L	P426978	
		Magnesium	64.5		mg/L	P426978	
		Strontium	1.20E+03		ug/L	P426978	
		Tin	9.0	U	ug/L	P426978	
		Titanium	186		ug/L	P426978	
		Vanadium	16	I	ug/L	P426978	
		Zinc	15	U	ug/L	P426978	
	EPA 200.8 Rev. 5.4	Aluminum	2.14E+03		ug/L	P427303	
		Antimony	1.33		ug/L	P426978	
		Arsenic	22.3		ug/L	P426978	
		Beryllium	0.14	I	ug/L	P426978	
		Cadmium	0.080	U	ug/L	P426978	
		Chromium	11	I	ug/L	P426978	
		Cobalt	0.43		ug/L	P426978	
		Copper	1.6	U	ug/L	P426978	
		Lead	2.0		ug/L	P426978	
		Manganese	71.8		ug/L	P426978	
		Molybdenum	7.5		ug/L	P426978	
		Nickel	2.5	I	ug/L	P426978	
		Selenium	0.91	I	ug/L	P426978	
		Silver	0.040	U	ug/L	P426978	
		Thallium	0.40	U	ug/L	P426978	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The aluminum result was confirmed in the undigested sample on 03/13/2023. The beryllium result was confirmed on 03/20/2023.

Quality Assurance Report
Method Blank Results

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: P426978

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426978

Component	Result	Code	Units
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427303

Component	Result	Code	Units
Aluminum	5.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426793

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426850

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426668

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426888

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

Reference Method: SM 2320 B-2011
Batch ID: P426973

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

Reference Method: SM 2540 D-2015
Batch ID: P426967

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P426974

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: P426797

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: 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: P426978

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	102		P	85 - 115
Strontium	101		P	85 - 115
Tin	96.0		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.5		P	85 - 115
Zinc	97.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426978

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	97.8		P	85 - 115
Arsenic	97.3		P	85 - 115
Beryllium	87.0		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	99.2		P	85 - 115
Cobalt	96.5		P	85 - 115
Copper	95.6		P	85 - 115
Lead	96.4		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	94.8		P	85 - 115
Nickel	98.2		P	85 - 115
Selenium	98.1		P	85 - 115
Silver	96.7		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427303

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426793

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426850

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426888

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

Reference Method: SM 2320 B-2011
Batch ID: P426973

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.9		P	94 - 106

Reference Method: SM 2540 D-2015
Batch ID: P426967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	101		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P426974

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		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: P426797

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392119	Iron	96.3	98.0	P/P	70 - 130
2392119	Strontium	101	103	P/P	70 - 130
2392119	Tin	86.6	86.1	P/P	70 - 130
2392119	Titanium	100	104	P/P	70 - 130
2392119	Vanadium	97.5	101	P/P	70 - 130
2392119	Zinc	94.2	95.9	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392119	Antimony	106	105	P/P	70 - 130
2392119	Arsenic	109	108	P/P	70 - 130
2392119	Beryllium	97.2	92.4	P/P	70 - 130
2392119	Cadmium	101	98.7	P/P	70 - 130
2392119	Chromium	98.1	97.6	P/P	70 - 130
2392119	Cobalt	108	106	P/P	70 - 130
2392119	Copper	112	110	P/P	70 - 130
2392119	Lead	102	101	P/P	70 - 130
2392119	Manganese	93.1	92.2	P/P	70 - 130
2392119	Molybdenum	108	107	P/P	70 - 130
2392119	Nickel	112	111	P/P	70 - 130
2392119	Selenium	106	104	P/P	70 - 130
2392119	Silver	94.8	93.1	P/P	70 - 130
2392119	Thallium	108	105	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394376	Aluminum	108	108	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391104	Ammonia-N	99.4	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391407	Kjeldahl Nitrogen	106	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391104	NO2NO3-N	104	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391407	Total-P	98.8	97.6	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P426974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389690	Fluoride	98.7	98.7	P/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: P426797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391105	Organic Carbon	85.5	88.3	P/P	85 - 115

Quality Assurance Report
Precision

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: P426978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392119	Calcium	0.367	Spike	P	0 - 20
2392119	Iron	1.62	Spike	P	0 - 20
2392119	Magnesium	0.261	Spike	P	0 - 20
2392119	Strontium	1.06	Spike	P	0 - 20
2392119	Tin	0.618	Spike	P	0 - 20
2392119	Titanium	3.92	Spike	P	0 - 20
2392119	Vanadium	3.13	Spike	P	0 - 20
2392119	Zinc	1.83	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392119	Antimony	0.516	Spike	P	0 - 20
2392119	Arsenic	0.879	Spike	P	0 - 20
2392119	Beryllium	5.11	Spike	P	0 - 20
2392119	Cadmium	2.20	Spike	P	0 - 20
2392119	Chromium	0.512	Spike	P	0 - 20
2392119	Cobalt	2.20	Spike	P	0 - 20
2392119	Copper	1.50	Spike	P	0 - 20
2392119	Lead	1.01	Spike	P	0 - 20
2392119	Manganese	0.771	Spike	P	0 - 20
2392119	Molybdenum	1.25	Spike	P	0 - 20
2392119	Nickel	1.11	Spike	P	0 - 20
2392119	Selenium	1.26	Spike	P	0 - 20
2392119	Silver	1.80	Spike	P	0 - 20
2392119	Thallium	2.63	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394376	Aluminum	0.314	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391104	Ammonia-N	1.24	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391407	Kjeldahl Nitrogen	3.92	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391104	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391407	Total-P	1.22	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P426973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391097	Total Alkalinity	0.191	Sample	P	0 - 3.8

Reference Method: SM 4500-F- C-2011
Batch ID: P426974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389690	Fluoride	0.0	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: P426797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391105	Organic Carbon	2.84	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: A117768
Included Lab Sample IDs: 2391198, 2391200

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117843
Included Lab Sample IDs: 2391199, 2391201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117845
Included Lab Sample IDs: 2391199, 2391201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.7	P/P	90 - 110
Ammonia-N	99.3	99.5	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A117846
Included Lab Sample IDs: 2391199, 2391201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	96.2	P/P	90 - 110
Organic Carbon	96.2	98.5	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A117917
Included Lab Sample IDs: 2391198, 2391200

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.7	91.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117917
Included Lab Sample IDs: 2391198

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117927
Included Lab Sample IDs: 2391199, 2391201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.6	96.0	P/P	90 - 110
Total-P	97.2	95.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117947
Included Lab Sample IDs: 2391206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	97.3	97.1	P/P	90 - 110
Arsenic	97.8	98.5	P/P	90 - 110
Beryllium	95.6	95.3	P/P	90 - 110
Cadmium	97.9	97.6	P/P	90 - 110
Cobalt	97.2	97.0	P/P	90 - 110
Copper	97.8	99.1	P/P	90 - 110
Lead	96.1	97.0	P/P	90 - 110
Manganese	98.6	96.3	P/P	90 - 110
Molybdenum	93.8	94.6	P/P	90 - 110
Nickel	99.3	99.6	P/P	90 - 110
Selenium	99.5	101	P/P	90 - 110
Silver	95.3	95.8	P/P	90 - 110
Thallium	96.2	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117968
Included Lab Sample IDs: 2391199, 2391201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117969
Included Lab Sample IDs: 2391206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.1	97.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117988
Included Lab Sample IDs: 2391200

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A118086
Included Lab Sample IDs: 2391206

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118115
Included Lab Sample IDs: 2391206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	102	99.6	P/P	90 - 110
Magnesium	102	98.8	P/P	90 - 110
Strontium	102	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118115
Included Lab Sample IDs: 2391206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	99.2	101	P/P	90 - 110
Titanium	98.5	100	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity	100				3.73	
EPA 200.7 Rev. 4.4	Calcium	102					0.367
	Iron	104	96.3	98.0			1.62
	Magnesium	102					0.261
	Strontium	101	101	103			1.06
	Tin	96.0	86.6	86.1			0.618
	Titanium	101	100	104			3.92
	Vanadium	99.5	97.5	101			3.13
	Zinc	97.9	94.2	95.9			1.83
EPA 200.8 Rev. 5.4	Aluminum	103	108	108			0.314
	Antimony	97.8	106	105			0.516
	Arsenic	97.3	109	108			0.879
	Beryllium	87.0	97.2	92.4			5.11
	Cadmium	98.3	101	98.7			2.20
	Chromium	99.2	98.1	97.6			0.512
	Cobalt	96.5	108	106			2.20
	Copper	95.6	112	110			1.50
	Lead	96.4	102	101			1.01
	Manganese	100	93.1	92.2			0.771
	Molybdenum	94.8	108	107			1.25
	Nickel	98.2	112	111			1.11
	Selenium	98.1	106	104			1.26
	Silver	96.7	94.8	93.1			1.80
	Thallium	101	108	105			2.63
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	99.4	101			1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	106	110			3.92
EPA 353.2 Rev. 2.0	NO2NO3-N	106	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	96.9	98.8	97.6			1.22
SM 2320 B-2011	Total Alkalinity	95.9				0.191	
SM 2540 D-2015	TSS	101					
SM 4500-F- C-2011	Fluoride	101	98.7	98.7			0.0
	Fluoride	99.8	100	101			0.467
SM 5310 B-2011	Organic Carbon	92.4	85.5	88.3			2.84

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2391198, 2391200
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2391206
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2391206
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2391199, 2391201
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2391199, 2391201
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2391199, 2391201
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2391199, 2391201
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2391198, 2391200
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2391198, 2391200
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2391198, 2391200
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2391199, 2391201

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/02/2023			03/02/2023 14:20	Chandler E Cox	2391198
	03/02/2023			03/02/2023 14:26	Chandler E Cox	2391200
EPA 200.7 Rev. 4.4	03/02/2023	03/10/2023 10:15	Vijayalakshmi Reddy	03/21/2023 20:07	McKinley C Carter	2391206
EPA 200.8 Rev. 5.4	03/02/2023	03/10/2023 10:15	Vijayalakshmi Reddy	03/10/2023 20:14	Conrad Hartmann	2391206
	03/02/2023	03/10/2023 10:15	Vijayalakshmi Reddy	03/13/2023 15:20	Conrad Hartmann	2391206
	03/02/2023	03/17/2023 12:20	George D Taylor	03/20/2023 17:53	Emily M Philpot	2391206
EPA 350.1 Rev. 2.0	03/02/2023			03/07/2023 10:34	Khloe J Berg	2391199
	03/02/2023			03/07/2023 11:40	Khloe J Berg	2391201
EPA 351.2 Rev. 2.0	03/02/2023	03/08/2023 17:54	Simonne.V. Calhoun	03/13/2023 19:07	Samantha L Bates	2391199
	03/02/2023	03/08/2023 17:54	Simonne.V. Calhoun	03/13/2023 19:08	Samantha L Bates	2391201
EPA 353.2 Rev. 2.0	03/02/2023			03/03/2023 11:00	Beverly Y. Sanders	2391199
	03/02/2023			03/03/2023 11:01	Beverly Y. Sanders	2391201
EPA 365.1 Rev. 2.0	03/02/2023	03/09/2023 13:42	Adam P Silver	03/10/2023 09:12	James L Waggerby	2391201
	03/02/2023	03/09/2023 13:42	Adam P Silver	03/10/2023 09:23	James L Waggerby	2391199
SM 2320 B-2011	03/02/2023			03/10/2023 00:26	Dale L. Simmons	2391198
	03/02/2023			03/10/2023 00:41	Dale L. Simmons	2391200
SM 2540 D-2015	03/02/2023			03/03/2023 15:41	Yijie Li	2391198, 2391200
SM 4500-F- C-2011	03/02/2023			03/09/2023 20:58	Dale L. Simmons	2391198
	03/02/2023			03/15/2023 00:06	Dale L. Simmons	2391200
SM 5310 B-2011	03/02/2023			03/07/2023 05:39	Elise M. Gillis	2391199
	03/02/2023			03/07/2023 06:39	Elise M. Gillis	2391201