

Chemical Analysis Report

SO-DIST-2021-11-02-01

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

Event Description: **2021 SMP : Continuous Flopbuck**

Request ID: **RQ-2021-11-01-58**

Customer: **SO-DIST**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 23-NOV-2021 09:40



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: Flopbuck Near Pearl St.

Collection Date/Time: 11/01/2021 08:25

Field ID: G3SD0185

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2287201	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P405886	
	SM 2320 B-2011	Total Alkalinity	178	A	mg CaCO3/L	P405987	
	SM 2540 D-2011	TSS	3	U	mg/L	P406420	
	SM 4500 F-C-2011	Fluoride	0.63		mg F/L	P405990	
2287202	EPA 350.1 Rev. 2.0	Ammonia-N	0.072		mg N/L	P406063	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P406122	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P405915	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P405925	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P406059	
2287203	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P405874	
2287206	EPA 200.7 Rev. 4.4	Calcium	220		mg/L	P406034	
		Iron	160		ug/L	P406034	
		Magnesium	416		mg/L	P406034	
		Manganese	32		ug/L	P406034	
		Strontium	3.27E+03		ug/L	P406034	
		Tin	15	U	ug/L	P406034	
		Vanadium	6.0	U	ug/L	P406034	
		Zinc	15	U	ug/L	P406034	
	EPA 200.8 Rev. 5.4	Aluminum	20	U	ug/L	P406034	
		Antimony	0.28	I	ug/L	P406034	
		Arsenic	1.99		ug/L	P406034	
		Beryllium	0.040	U	ug/L	P406034	
		Cadmium	0.080	U	ug/L	P406034	
		Chromium	1.6	U	ug/L	P406034	
		Cobalt	0.080	I	ug/L	P406034	
		Copper	1.6	U	ug/L	P406034	
		Lead	0.80	U	ug/L	P406034	
		Manganese	30.2		ug/L	P406034	
		Molybdenum	6.8		ug/L	P406034	
		Nickel	2.0	U	ug/L	P406034	
		Selenium	0.80	U	ug/L	P406034	
		Silver	0.040	U	ug/L	P406034	
		Thallium	0.40	U	ug/L	P406034	

Ref. Method and Comment:

SM 2540 D-2011: 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, magnesium and strontium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405886

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406034

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Strontium	2.0	U	ug/L
Tin	3.0	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: P406034

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406063

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406122

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405915

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405925

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405874

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P405987

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 D-2011
Batch ID: P406420

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P405990

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P406059

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	95.8		P	85 - 115
Magnesium	102		P	85 - 115
Manganese	92.6		P	85 - 115
Strontium	91.5		P	85 - 115
Tin	91.9		P	85 - 115
Vanadium	90.9		P	85 - 115
Zinc	91.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.5		P	85 - 115
Antimony	95.9		P	85 - 115
Arsenic	90.5		P	85 - 115
Beryllium	91.5		P	85 - 115
Cadmium	91.1		P	85 - 115
Chromium	91.9		P	85 - 115
Cobalt	94.8		P	85 - 115
Copper	91.5		P	85 - 115
Lead	92.0		P	85 - 115
Manganese	92.2		P	85 - 115
Molybdenum	92.2		P	85 - 115
Nickel	92.0		P	85 - 115
Selenium	93.2		P	85 - 115
Silver	98.4		P	85 - 115
Thallium	93.6		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406063

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406122

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405915

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: P405925

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405874

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

Reference Method: SM 2320 B-2011
Batch ID: P405987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P405990

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P406059

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286774	Iron	93.5	92.9	P/P	70 - 130
2286774	Manganese	89.8	88.5	P/P	70 - 130
2286774	Tin	72.9	73.2	P/P	70 - 130
2286774	Vanadium	94.8	94.2	P/P	70 - 130
2286774	Zinc	89.5	88.0	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286774	Aluminum	93.9	91.7	P/P	70 - 130
2286774	Antimony	100	96.6	P/P	70 - 130
2286774	Arsenic	96.5	93.7	P/P	70 - 130
2286774	Beryllium	107	103	P/P	70 - 130
2286774	Cadmium	92.2	87.7	P/P	70 - 130
2286774	Chromium	89.4	86.6	P/P	70 - 130
2286774	Cobalt	102	97.3	P/P	70 - 130
2286774	Copper	103	99.3	P/P	70 - 130
2286774	Lead	94.1	91.4	P/P	70 - 130
2286774	Manganese	88.5	84.6	P/P	70 - 130
2286774	Molybdenum	101	98.0	P/P	70 - 130
2286774	Nickel	97.0	93.2	P/P	70 - 130
2286774	Selenium	96.9	94.3	P/P	70 - 130
2286774	Silver	103	106	P/P	70 - 130
2286774	Thallium	94.9	92.5	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287093	Ammonia-N	102	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286762	Kjeldahl Nitrogen	102	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287093	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286744	Total-P	97.6	94.6	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287238	O-Phosphate-P	96.5	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P405990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2287201	Fluoride	98.9	99.8	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P406059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286762	Organic Carbon	92.2	93.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P405886

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287101	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P406034

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286774	Calcium	0.782	Spike	P	0 - 20
2286774	Iron	0.663	Spike	P	0 - 20
2286774	Magnesium	1.61	Spike	P	0 - 20
2286774	Manganese	1.26	Spike	P	0 - 20
2286774	Strontium	0.125	Spike	P	0 - 20
2286774	Tin	0.430	Spike	P	0 - 20
2286774	Vanadium	0.699	Spike	P	0 - 20
2286774	Zinc	1.61	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P406034

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286774	Aluminum	2.13	Spike	P	0 - 20
2286774	Antimony	3.72	Spike	P	0 - 20
2286774	Arsenic	2.85	Spike	P	0 - 20
2286774	Beryllium	3.89	Spike	P	0 - 20
2286774	Cadmium	4.99	Spike	P	0 - 20
2286774	Chromium	3.26	Spike	P	0 - 20
2286774	Cobalt	4.32	Spike	P	0 - 20
2286774	Copper	3.45	Spike	P	0 - 20
2286774	Lead	3.01	Spike	P	0 - 20
2286774	Manganese	3.13	Spike	P	0 - 20
2286774	Molybdenum	2.38	Spike	P	0 - 20
2286774	Nickel	3.99	Spike	P	0 - 20
2286774	Selenium	2.78	Spike	P	0 - 20
2286774	Silver	3.10	Spike	P	0 - 20
2286774	Thallium	2.60	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406063

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287093	Ammonia-N	1.87	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406122

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286762	Kjeldahl Nitrogen	4.36	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287093	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286744	Total-P	3.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287238	O-Phosphate-P	1.58	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P405987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287201	Total Alkalinity	0.383	Sample	P	0 - 5.2

Reference Method: SM 4500 F-C-2011
Batch ID: P405990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2287201	Fluoride	0.476	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P406059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286762	Organic Carbon	1.52	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108663

Included Lab Sample IDs: 2287203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108665

Included Lab Sample IDs: 2287201

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108679

Included Lab Sample IDs: 2287202

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

Reference Method: SM 2320 B-2011

Run ID: A108707

Included Lab Sample IDs: 2287201

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A108707

Included Lab Sample IDs: 2287201

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108724

Included Lab Sample IDs: 2287202

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

Reference Method: SM 5310 B-2011

Run ID: A108741

Included Lab Sample IDs: 2287202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.4	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108743

Included Lab Sample IDs: 2287202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	96.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108800

Included Lab Sample IDs: 2287202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108810

Included Lab Sample IDs: 2287206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	107	P/P	90 - 110
Iron	104	108	P/P	90 - 110
Magnesium	103	107	P/P	90 - 110
Tin	101	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108867

Included Lab Sample IDs: 2287206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	103	104	P/P	90 - 110
Strontium	103	102	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	103	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108892

Included Lab Sample IDs: 2287206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	100	100	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Beryllium	99.4	103	P/P	90 - 110
Cadmium	98.9	97.9	P/P	90 - 110
Cobalt	102	103	P/P	90 - 110
Copper	101	103	P/P	90 - 110
Lead	96.3	95.7	P/P	90 - 110
Manganese	98.6	100	P/P	90 - 110
Molybdenum	99.1	99.8	P/P	90 - 110
Nickel	99.5	101	P/P	90 - 110
Selenium	103	103	P/P	90 - 110
Thallium	96.1	94.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108928

Included Lab Sample IDs: 2287206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	100	P/P	90 - 110
Chromium	98.1	95.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108953

Included Lab Sample IDs: 2287206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.3	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Calcium	103					0.782
	Iron	95.8	93.5	92.9			0.663
	Magnesium	102					1.61
	Manganese	92.6	89.8	88.5			1.26
	Strontium	91.5					0.125
	Tin	91.9	72.9	73.2			0.430
	Vanadium	90.9	94.8	94.2			0.699
	Zinc	91.3	89.5	88.0			1.61
EPA 200.8 Rev. 5.4	Aluminum	95.5	93.9	91.7			2.13
	Antimony	95.9	100	96.6			3.72
	Arsenic	90.5	96.5	93.7			2.85
	Beryllium	91.5	107	103			3.89
	Cadmium	91.1	92.2	87.7			4.99
	Chromium	91.9	89.4	86.6			3.26
	Cobalt	94.8	102	97.3			4.32
	Copper	91.5	103	99.3			3.45
	Lead	92.0	94.1	91.4			3.01
	Manganese	92.2	88.5	84.6			3.13
	Molybdenum	92.2	101	98.0			2.38
	Nickel	92.0	97.0	93.2			3.99
	Selenium	93.2	94.3	96.9			2.78
	Silver	98.4	103	106			3.10
	Thallium	93.6	94.9	92.5			2.60
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	102	100			1.87
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	96.9			4.36
EPA 353.2 Rev. 2.0	NO2NO3-N	102	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	104	97.6	94.6			3.04
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.9	96.5	98.5			1.58
SM 2320 B-2011	Total Alkalinity	99.1				0.383	
SM 4500 F-C-2011	Fluoride	100	98.9	99.8			0.476
SM 5310 B-2011	Organic Carbon	101	92.2	93.8			1.52

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2287201
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2287206
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2287206
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2287202
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2287202
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2287202
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2287202
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2287203
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2287201
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2287201
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2287201
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2287202

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	11/02/2021			11/02/2021 16:49	Khloe J Berg	2287201
EPA 200.7 Rev. 4.4	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/09/2021 14:12	Josef B Mick	2287206
	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/09/2021 14:20	Josef B Mick	2287206
	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/10/2021 20:08	Josef B Mick	2287206
EPA 200.8 Rev. 5.4	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/12/2021 19:19	McKinley C Carter	2287206
	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/17/2021 00:12	Alexander Thompson	2287206
	11/02/2021	11/05/2021 09:30	Emily M Philpot	11/17/2021 15:47	Alexander Thompson	2287206
EPA 350.1 Rev. 2.0	11/02/2021			11/04/2021 11:45	Ping Hua	2287202
EPA 351.2 Rev. 2.0	11/02/2021	11/08/2021 13:15	Benjamin T. Nordmann	11/09/2021 11:08	Alexandra J Mattheus	2287202
EPA 353.2 Rev. 2.0	11/02/2021			11/03/2021 09:19	Beverly Y. Sanders	2287202
EPA 365.1 Rev. 2.0	11/02/2021	11/03/2021 16:35	Simonne.V. Calhoun	11/04/2021 14:55	Lipi Saha	2287202
EPA 365.1 Rev. 2.0 dissolved	11/02/2021			11/02/2021 15:33	James L Waggeberby	2287203
SM 2320 B-2011	11/02/2021			11/03/2021 23:13	Dale L. Simmons	2287201
SM 2540 D-2011	11/02/2021			11/05/2021 15:35	Yijie Li	2287201
SM 4500 F-C-2011	11/02/2021			11/03/2021 21:47	Dale L. Simmons	2287201
SM 5310 B-2011	11/02/2021			11/04/2021 07:32	Khloe J Berg	2287202