

Chemical Analysis Report

TLH-ROC-2021-11-15-01

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

Event Description: **0Run 14**
Request ID: **RQ-2021-08-02-68**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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Date Certified: 06-DEC-2021 09:55



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: Williford Spring

Collection Date/Time: 11/15/2021 10:55

Field ID: G3TLHR0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2289550	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P406388	
	EPA 300.0 Rev. 2.1	Chloride	2.7		mg Cl/L	P406522	
		Sulfate	1.4		mg SO4/L	P406524	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P406377	
	SM 2320 B-2011	Total Alkalinity	69		mg CaCO3/L	P406488	
	SM 2540 C-2011	TDS	73		mg/L	P406775	
	SM 2540 D-2011	TSS	2	U	mg/L	P406734	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P406490	
2289551	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P406596	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P406706	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P406416	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P406458	
	SM 5310 B-2011	Organic Carbon	0.67	I	mg C/L	P406871	
2289552	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P406381	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P406388

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406404

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406404

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
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	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: P406522

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406524

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406596

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406706

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406416

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406459

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406381

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

Reference Method: SM 2120 B-2011
Batch ID: P406377

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P406488

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

Reference Method: SM 2540 C-2011
Batch ID: P406775

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P406734

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P406490

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P406871

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: P406404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	111		P	85 - 115
Iron	110		P	85 - 115
Magnesium	113		P	85 - 115
Manganese	106		P	85 - 115
Potassium	103		P	85 - 115
Sodium	107		P	85 - 115
Zinc	110		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	106		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	106		P	85 - 115
Beryllium	103		P	85 - 115
Boron	105		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	101		P	85 - 115
Copper	105		P	85 - 115
Lead	101		P	85 - 115
Nickel	105		P	85 - 115
Selenium	103		P	85 - 115
Silver	102		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406522

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406524

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406706

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P406416

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406458

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406459

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P406381

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

Reference Method: SM 2120 B-2011

Batch ID: P406377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: SM 2320 B-2011

Batch ID: P406488

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500 F-C-2011

Batch ID: P406490

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.9		P	93 - 104

Reference Method: SM 5310 B-2011

Batch ID: P406871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P406404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289351	Barium	102		P	80 - 120
2289351	Calcium	105		P	80 - 120
2289351	Iron	111		P	80 - 120
2289351	Magnesium	112		P	80 - 120
2289351	Manganese	106		P	80 - 120
2289351	Potassium	107		P	80 - 120
2289351	Sodium	105		P	80 - 120
2289351	Zinc	112		P	80 - 120
2289558	Iron	113	113	P/P	80 - 120
2289558	Magnesium	115	115	P/P	80 - 120
2289558	Manganese	106	108	P/P	80 - 120
2289558	Potassium	102	102	P/P	80 - 120
2289558	Sodium	107	105	P/P	80 - 120
2289558	Zinc	110	112	P/P	80 - 120
3389558	Barium	104	106	P/P	80 - 120
3389558	Calcium	112	111	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P406404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289351	Aluminum	103		P	80 - 120
2289351	Antimony	110		P	80 - 120
2289351	Arsenic	105		P	80 - 120
2289351	Beryllium	108		P	80 - 120
2289351	Boron	99.8		P	80 - 120
2289351	Cadmium	105		P	80 - 120
2289351	Chromium	104		P	80 - 120
2289351	Copper	101		P	80 - 120
2289351	Lead	100		P	80 - 120
2289351	Nickel	103		P	80 - 120
2289351	Selenium	102		P	80 - 120
2289351	Silver	101		P	80 - 120
2289351	Thallium	106		P	80 - 120
2289558	Aluminum	105	105	P/P	80 - 120
2289558	Antimony	108	109	P/P	80 - 120
2289558	Arsenic	105	105	P/P	80 - 120
2289558	Beryllium	104	103	P/P	80 - 120
2289558	Boron	104	105	P/P	80 - 120
2289558	Cadmium	102	104	P/P	80 - 120
2289558	Chromium	103	102	P/P	80 - 120
2289558	Copper	103	103	P/P	80 - 120
2289558	Lead	101	101	P/P	80 - 120
2289558	Nickel	104	103	P/P	80 - 120
2289558	Selenium	103	102	P/P	80 - 120
2289558	Silver	102	101	P/P	80 - 120
2289558	Thallium	107	108	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406522

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406522

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289326	Chloride	99.5		P	90 - 110
2289343	Chloride	97.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289326	Sulfate	102		P	90 - 110
2289343	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289516	Ammonia-N	94.2	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289554	Kjeldahl Nitrogen	103	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289551	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289442	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289609	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289552	O-Phosphate-P	96.3	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P406490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289608	Fluoride	100	100	P/P	92 - 107

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P406871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289729	Organic Carbon	95.7	95.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P406388

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289799	Turbidity	7.35	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P406404

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289558	Iron	0.257	Spike	P	0 - 20
2289558	Magnesium	0.198	Spike	P	0 - 20
2289558	Manganese	2.06	Spike	P	0 - 20
2289558	Potassium	0.458	Spike	P	0 - 20
2289558	Sodium	1.26	Spike	P	0 - 20
2289558	Zinc	2.27	Spike	P	0 - 20
3389558	Barium	1.99	Spike	P	0 - 20
3389558	Calcium	0.632	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P406404

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289558	Aluminum	0.0162	Spike	P	0 - 20
2289558	Antimony	1.35	Spike	P	0 - 20
2289558	Arsenic	0.0307	Spike	P	0 - 20
2289558	Beryllium	0.961	Spike	P	0 - 20
2289558	Boron	0.897	Spike	P	0 - 20
2289558	Cadmium	1.63	Spike	P	0 - 20
2289558	Chromium	0.214	Spike	P	0 - 20
2289558	Copper	0.509	Spike	P	0 - 20
2289558	Lead	0.0702	Spike	P	0 - 20
2289558	Nickel	0.717	Spike	P	0 - 20
2289558	Selenium	1.02	Spike	P	0 - 20
2289558	Silver	0.564	Spike	P	0 - 20
2289558	Thallium	0.686	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406522

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289326	Chloride	1.20	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406524

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289326	Sulfate	1.03	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289516	Ammonia-N	2.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289554	Kjeldahl Nitrogen	2.80	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289551	NO2NO3-N	0.280	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289442	Total-P	0.289	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289609	Total-P	0.723	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289552	O-Phosphate-P	1.91	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P406377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289597	Color (true)	3.90	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P406488

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289608	Total Alkalinity	1.59	Sample	P	0 - 5.2

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P406775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289514	TDS	3.42	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P406490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289608	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P406871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289729	Organic Carbon	0.163	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A108924

Included Lab Sample IDs: 2289550, 2289553

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	101	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108925

Included Lab Sample IDs: 2289552, 2289555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	98.3	P/P	90 - 110
O-Phosphate-P	98.3	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108927

Included Lab Sample IDs: 2289550, 2289553

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: A108938

Included Lab Sample IDs: 2289551, 2289554

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

Reference Method: SM 2320 B-2011

Run ID: A108970

Included Lab Sample IDs: 2289550, 2289553

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A108970

Included Lab Sample IDs: 2289550, 2289553

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A108975

Included Lab Sample IDs: 2289550, 2289553

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.2	99.3	P/P	90 - 110
Sulfate	101	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A109006

Included Lab Sample IDs: 2289551, 2289554

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A109006

Included Lab Sample IDs: 2289551, 2289554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109018

Included Lab Sample IDs: 2289558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	101	P/P	90 - 110
Antimony	99.5	102	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Beryllium	101	98.7	P/P	90 - 110
Boron	100	103	P/P	90 - 110
Cadmium	98.1	101	P/P	90 - 110
Chromium	95.6	98.0	P/P	90 - 110
Copper	101	99.3	P/P	90 - 110
Lead	94.9	95.5	P/P	90 - 110
Nickel	100	99.3	P/P	90 - 110
Selenium	99.7	99.5	P/P	90 - 110
Silver	97.2	97.5	P/P	90 - 110
Thallium	98.8	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A109034

Included Lab Sample IDs: 2289558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	90 - 110
Iron	106	106	P/P	90 - 110
Manganese	104	104	P/P	90 - 110
Potassium	98.0	98.2	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Zinc	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A109042

Included Lab Sample IDs: 2289551, 2289554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	97.8	P/P	90 - 110
Total-P	97.0	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A109076

Included Lab Sample IDs: 2289558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	103	P/P	90 - 110
Magnesium	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A109088

Included Lab Sample IDs: 2289551, 2289554

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

Reference Method: SM 5310 B-2011

Run ID: A109141

Included Lab Sample IDs: 2289551, 2289554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	98.4	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				
EPA 180.1 Rev. 2.0	Turbidity					7.35	
EPA 200.7 Rev. 4.4	Barium	104	102	104	106		1.99
	Calcium	111	105	112	111		0.632
	Iron	110	111	113	113		0.257
	Magnesium	113	112	115	115		0.198
	Manganese	106	106	106	108		2.06
	Potassium	103	107	102	102		0.458
	Sodium	107	105	107	105		1.26
	Zinc	110	112	110	112		2.27
EPA 200.8 Rev. 5.4	Aluminum	106	105	105	103		0.0162
	Antimony	107	108	109	110		1.35
	Arsenic	106	105	105	105		0.0307
	Beryllium	103	104	103	108		0.961
	Boron	105	104	105	99.8		0.897
	Cadmium	102	102	104	105		1.63
	Chromium	101	103	102	104		0.214
	Copper	105	103	103	101		0.509
	Lead	101	101	101	100		0.0702
	Nickel	105	104	103	103		0.717
	Selenium	103	103	102	102		1.02
	Silver	102	102	101	101		0.564
	Thallium	106	107	108	106		0.686
EPA 300.0 Rev. 2.1	Chloride	99.2	99.5	97.6		1.20	
	Sulfate	101	102	96.4		1.03	
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	94.2	96.6			2.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103	107			2.80
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	101			0.280
EPA 365.1 Rev. 2.0	Total-P	106	104	103			0.289
	Total-P	102	104	105			0.723
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	96.3	98.4			1.91
SM 2120 B-2011	Color (true)	99.8				3.90	
SM 2320 B-2011	Total Alkalinity	101				1.59	
SM 2540 C-2011	TDS					3.42	
SM 4500 F-C-2011	Fluoride	99.9	100	100			0.0
SM 5310 B-2011	Organic Carbon	96.3	95.7	95.9			0.163

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2289550, 2289553
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2289558
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2289558
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2289550, 2289553
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2289550, 2289553
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2289551, 2289554
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2289551, 2289554
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2289551, 2289554
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2289551, 2289554
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2289552, 2289555
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2289550, 2289553

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2289550, 2289553
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2289558
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2289550, 2289553
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2289550, 2289553
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2289550, 2289553
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2289551, 2289554

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	11/15/2021			11/16/2021 16:53	Khloe J Berg	2289550, 2289553
EPA 200.7 Rev. 4.4	11/15/2021	11/17/2021 10:15	Emily M Philpot	11/19/2021 15:57	Josef B Mick	2289558
	11/15/2021	11/17/2021 10:15	Emily M Philpot	11/24/2021 00:05	Josef B Mick	2289558
EPA 200.8 Rev. 5.4	11/15/2021	11/17/2021 10:15	Emily M Philpot	11/19/2021 19:45	Alexander Thompson	2289558
EPA 300.0 Rev. 2.1	11/15/2021			11/17/2021 16:37	Roberta Tatti	2289550
	11/15/2021			11/17/2021 16:49	Roberta Tatti	2289553
EPA 350.1 Rev. 2.0	11/15/2021			11/19/2021 13:08	Roberta Tatti	2289551
	11/15/2021			11/19/2021 13:09	Roberta Tatti	2289554
EPA 351.2 Rev. 2.0	11/15/2021	11/23/2021 13:30	Benjamin T. Nordmann	11/24/2021 12:57	Alexandra J Mattheus	2289551
	11/15/2021	11/23/2021 13:30	Benjamin T. Nordmann	11/24/2021 12:59	Alexandra J Mattheus	2289554
EPA 353.2 Rev. 2.0	11/15/2021			11/17/2021 09:13	Beverly Y. Sanders	2289551
	11/15/2021			11/17/2021 09:19	Beverly Y. Sanders	2289554
EPA 365.1 Rev. 2.0	11/15/2021	11/17/2021 16:55	Simonne.V. Calhoun	11/18/2021 16:20	Sarah A Nixon	2289551
	11/15/2021	11/17/2021 16:55	Simonne.V. Calhoun	11/18/2021 16:30	Sarah A Nixon	2289554
EPA 365.1 Rev. 2.0 dissolved	11/15/2021			11/16/2021 14:52	James L Waggeberby	2289552
	11/15/2021			11/16/2021 15:03	James L Waggeberby	2289555
SM 2120 B-2011	11/15/2021			11/16/2021 15:04	Blanca Fach	2289550
	11/15/2021			11/16/2021 15:05	Blanca Fach	2289553
SM 2320 B-2011	11/15/2021			11/17/2021 20:02	Dale L. Simmons	2289550
	11/15/2021			11/17/2021 20:12	Dale L. Simmons	2289553
SM 2340B	11/15/2021			11/24/2021 00:05	Josef B Mick	2289558
SM 2540 C-2011	11/15/2021			11/18/2021 15:56	Yijie Li	2289550, 2289553
SM 2540 D-2011	11/15/2021			11/18/2021 15:56	Yijie Li	2289550, 2289553
SM 4500 F-C-2011	11/15/2021			11/17/2021 20:02	Dale L. Simmons	2289550
	11/15/2021			11/17/2021 20:12	Dale L. Simmons	2289553
SM 5310 B-2011	11/15/2021			11/30/2021 00:19	Khloe J Berg	2289551
	11/15/2021			11/30/2021 00:31	Khloe J Berg	2289554