

Chemical Analysis Report

CEN-DIST-2018-12-05-01

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

Event Description: **Drawdy X2**
Request ID: **RQ-2018-12-03-55**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 28-DEC-2018 16:08



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 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: Lake Drawdy @ 150m NNE of Center (3033D)

Collection Date/Time: 12/04/2018 11:03

Field ID: G2CE0079

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2046478	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P355670	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P355911	
		Sulfate	7.3		mg SO ₄ /L	P355913	
		Color (true)	270		PCU	P355665	
	SM 2320 B-97	Total Alkalinity	4.6		mg CaCO ₃ /L	P356044	
	SM 2540 C-97	TDS	93		mg/L	P355999	
	SM 2540 D-97	TSS	3	I	mg/L	P356011	
	SM 4500 F-C-97	Fluoride	0.037	I	mg F/L	P356047	
2046480	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P355901	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P355882	
	EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	0.23		mg N/L	P355837	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P355831	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P355855	
2046482	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P355674	
2046491	EPA 200.7 Rev. 4.4	Calcium	6.24		mg/L	P355673	
		Iron	200		ug/L	P355673	
		Magnesium	1.98		mg/L	P355673	
		Potassium	2.3		mg/L	P355673	
		Sodium	11.1		mg/L	P355673	
		Zinc	5.0	U	ug/L	P355673	
	EPA 200.8 Rev. 5.4	Arsenic	1.36		ug/L	P355673	
		Cadmium	0.021	I	ug/L	P355673	
		Chromium	0.59	I	ug/L	P355673	
		Copper	1.11		ug/L	P355673	
		Lead	0.42		ug/L	P355673	
		Nickel	0.20	U	ug/L	P355673	
		Silver	0.010	U	ug/L	P355673	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Lake Drawdy @ 150m S of Center (3033D)

Collection Date/Time: 12/04/2018 11:28

Field ID: G2CE0078

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2046479	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P355670	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P355911	
		Sulfate	7.3		mg SO ₄ /L	P355913	
		Color (true)	260		PCU	P355665	
	SM 2320 B-97	Total Alkalinity	4.2		mg CaCO ₃ /L	P356044	
	SM 2540 C-97	TDS	93		mg/L	P355999	
	SM 2540 D-97	TSS	3	I	mg/L	P356011	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P356047	
2046481	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P355901	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P355882	
	EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	0.24		mg N/L	P355837	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P355831	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P355855	
2046483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P355674	
2046492	EPA 200.7 Rev. 4.4	Calcium	5.68		mg/L	P355673	
		Iron	170		ug/L	P355673	
		Magnesium	1.82		mg/L	P355673	
		Potassium	2.1		mg/L	P355673	
		Sodium	11.6		mg/L	P355673	
		Zinc	5.0	U	ug/L	P355673	
	EPA 200.8 Rev. 5.4	Arsenic	1.43		ug/L	P355673	
		Cadmium	0.020	U	ug/L	P355673	
		Chromium	0.60	I	ug/L	P355673	
		Copper	1.17		ug/L	P355673	
		Lead	0.43		ug/L	P355673	
		Nickel	0.20	U	ug/L	P355673	
		Silver	0.010	U	ug/L	P355673	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples 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: P355670

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355673

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355911

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355913

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355901

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355882

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: P355837

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355831

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355674

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

Reference Method: SM 2120 B
Batch ID: P355665

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356044

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

Reference Method: SM 2540 C-97
Batch ID: P355999

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356011

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356047

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P355855

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: P355673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	80 - 120
Iron	102		P	80 - 120
Magnesium	107		P	80 - 120
Potassium	98.9		P	80 - 120
Sodium	95.1		P	85 - 115
Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	96.3		P	85 - 115
Lead	105		P	85 - 115
Nickel	97.2		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355913

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355901

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355831

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.7		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P355665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P356044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356047

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355855

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: P355673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045970	Calcium	104		P	80 - 120
2045970	Iron	101		P	80 - 120
2045970	Magnesium	108		P	80 - 120
2045970	Potassium	99.5		P	80 - 120
2045970	Sodium	98.1		P	80 - 120
2045970	Zinc	100		P	80 - 120
2046513	Calcium	101		P	80 - 120
2046513	Iron	102		P	80 - 120
2046513	Magnesium	105	103	P/P	80 - 120
2046513	Sodium	95.8		P	80 - 120
2046513	Zinc	105	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045970	Arsenic	104		P	80 - 120
2045970	Cadmium	108		P	80 - 120
2045970	Chromium	100		P	80 - 120
2045970	Copper	94.8		P	80 - 120
2045970	Lead	109		P	80 - 120
2045970	Nickel	95.1		P	80 - 120
2045970	Silver	104		P	80 - 120
2046513	Arsenic	102	101	P/P	80 - 120
2046513	Cadmium	111	111	P/P	80 - 120
2046513	Chromium	102	102	P/P	80 - 120
2046513	Copper	92.9	91.9	P/P	80 - 120
2046513	Lead	108	108	P/P	80 - 120
2046513	Nickel	91.8	92.3	P/P	80 - 120
2046513	Silver	105	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045982	Chloride	95.1		P	90 - 110
2046478	Chloride	98.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045982	Sulfate	96.6		P	90 - 110
2046478	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355901

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046293	Ammonia-N	101	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046485	Kjeldahl Nitrogen	99.6	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046480	NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046248	O-Phosphate-P	95.3	95.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P355855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046373	Organic Carbon	102		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046510	Turbidity	0.820	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046513	Calcium	0.807	Spike	P	0 - 20
2046513	Iron	1.02	Spike	P	0 - 20
2046513	Magnesium	0.699	Spike	P	0 - 20
2046513	Potassium	1.03	Spike	P	0 - 20
2046513	Sodium	0.107	Spike	P	0 - 20
2046513	Zinc	0.811	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046513	Arsenic	1.01	Spike	P	0 - 20
2046513	Cadmium	0.0610	Spike	P	0 - 20
2046513	Chromium	0.677	Spike	P	0 - 20
2046513	Copper	1.02	Spike	P	0 - 20
2046513	Lead	0.632	Spike	P	0 - 20
2046513	Nickel	0.523	Spike	P	0 - 20
2046513	Silver	1.15	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045982	Chloride	0.280	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045982	Sulfate	1.28	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355901

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046293	Ammonia-N	0.00246	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046485	Kjeldahl Nitrogen	0.127	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046480	NO2NO3-N	0.467	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046293	Total-P	0.821	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046248	O-Phosphate-P	0.315	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046290	Color (true)	2.40	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046603	Total Alkalinity	0.767	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046291	TDS	4.67	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046603	Fluoride	0.472	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P355855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046373	Organic Carbon	1.98	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A88172

Included Lab Sample IDs: 2046478, 2046479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	105	106	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88173

Included Lab Sample IDs: 2046478, 2046479

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88174

Included Lab Sample IDs: 2046482, 2046483

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88194

Included Lab Sample IDs: 2046478, 2046479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.9	99.1	P/P	90 - 110
Chloride	99.1	100	P/P	90 - 110
Sulfate	97.2	99.1	P/P	90 - 110
Sulfate	99.1	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88232

Included Lab Sample IDs: 2046480, 2046481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A88239

Included Lab Sample IDs: 2046480, 2046481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	99.4	P/P	90 - 110
Organic Carbon	99.4	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88258

Included Lab Sample IDs: 2046480, 2046481

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88265

Included Lab Sample IDs: 2046491, 2046492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	95.8	93.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88281

Included Lab Sample IDs: 2046491, 2046492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.5	101	P/P	90 - 110
Iron	96.2	101	P/P	90 - 110
Magnesium	97.0	102	P/P	90 - 110
Potassium	94.4	99.0	P/P	90 - 110
Zinc	101	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88282

Included Lab Sample IDs: 2046480, 2046481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.5	P/P	90 - 110
Total-P	98.5	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88297

Included Lab Sample IDs: 2046480, 2046481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.1	97.9	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88305

Included Lab Sample IDs: 2046478, 2046479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.6	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88305

Included Lab Sample IDs: 2046478, 2046479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88479

Included Lab Sample IDs: 2046491, 2046492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.0	97.6	P/P	90 - 110
Cadmium	106	107	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	95.6	93.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88479

Included Lab Sample IDs: 2046491, 2046492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	109	109	P/P	90 - 110
Nickel	95.3	94.2	P/P	90 - 110
Silver	102	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.820	
EPA 200.7 Rev. 4.4	Calcium	105	104	101				0.807
	Iron	102	101	102				1.02
	Magnesium	107	108	105	103			0.699
	Potassium	98.9	99.5					1.03
	Sodium	95.1	98.1	95.8				0.107
	Zinc	104	100	105	106			0.811
EPA 200.8 Rev. 5.4	Arsenic	102	104	102	101			1.01
	Cadmium	107	108	111	111			0.0610
	Chromium	99.5	100	102	102			0.677
	Copper	96.3	94.8	92.9	91.9			1.02
	Lead	105	109	108	108			0.632
	Nickel	97.2	95.1	91.8	92.3			0.523
	Silver	102	104	105	104			1.15
EPA 300.0 Rev. 2.1	Chloride	97.7	95.1	98.0			0.280	
	Sulfate	97.8	96.6	97.3			1.28	
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	101	101				0.0024
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.6	99.6	99.3				0.127
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	98.5					0.467
EPA 365.1 Rev. 2.0	Total-P	104						0.821
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	95.3	95.0				0.315
SM 2120 B	Color (true)	104					2.40	
SM 2320 B-97	Total Alkalinity	99.3					0.767	
SM 2540 C-97	TDS						4.67	
SM 4500 F-C-97	Fluoride	99.4						0.472
SM 5310 B-00	Organic Carbon	101	102					1.98

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2046478, 2046479
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2046491, 2046492
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2046491, 2046492
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2046478, 2046479
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2046478, 2046479
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2046480, 2046481
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2046480, 2046481
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2046480, 2046481
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2046480, 2046481
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2046482, 2046483
SM 2120 B / E31780	True Color measured at 450 nm	2046478, 2046479
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2046478, 2046479
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2046478, 2046479
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2046478, 2046479
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2046478, 2046479

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2046480, 2046481

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	12/05/2018			12/05/2018 16:10	Megan Treadwell	2046478, 2046479
EPA 200.7 Rev. 4.4	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/06/2018 20:18	Martin Acosta	2046491
	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/06/2018 20:26	Martin Acosta	2046492
	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/10/2018 15:55	Martin Acosta	2046491
	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/10/2018 16:00	Martin Acosta	2046492
EPA 200.8 Rev. 5.4	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/21/2018 03:05	Allison Taylor	2046491
	12/05/2018	12/05/2018 18:00	Elliott D. Healy	12/21/2018 03:14	Allison Taylor	2046492
EPA 300.0 Rev. 2.1	12/05/2018			12/07/2018 17:10	Lipi Saha	2046478
	12/05/2018			12/07/2018 20:23	Lipi Saha	2046479
EPA 350.1 Rev. 2.0	12/05/2018			12/07/2018 11:12	Ping Hua	2046480
	12/05/2018			12/07/2018 11:13	Ping Hua	2046481
EPA 351.2 Rev. 2.0	12/05/2018	12/10/2018 16:30	Adrian Shelby	12/11/2018 14:29	Joseph Suarez	2046480
	12/05/2018	12/10/2018 16:30	Adrian Shelby	12/11/2018 14:31	Joseph Suarez	2046481
EPA 353.2 Rev. 2.0	12/05/2018			12/07/2018 12:18	Lauren Bottorf	2046480
	12/05/2018			12/07/2018 12:30	Lauren Bottorf	2046481
EPA 365.1 Rev. 2.0	12/05/2018	12/07/2018 13:00	Sima Feizi	12/11/2018 14:03	Beverly Y. Sanders	2046480
	12/05/2018	12/07/2018 13:00	Sima Feizi	12/11/2018 14:11	Beverly Y. Sanders	2046481
EPA 365.1 Rev. 2.0 dissolved	12/05/2018			12/05/2018 16:53	Jhamieka S. Greenwood	2046482
	12/05/2018			12/05/2018 16:56	Jhamieka S. Greenwood	2046483
SM 2120 B	12/05/2018			12/05/2018 15:12	Chelsea Hernandez	2046478
	12/05/2018			12/05/2018 15:13	Chelsea Hernandez	2046479
SM 2320 B-97	12/05/2018			12/11/2018 23:32	Lauren Bottorf	2046478
	12/05/2018			12/11/2018 23:43	Lauren Bottorf	2046479
SM 2540 C-97	12/05/2018			12/06/2018 14:21	Yijie Li	2046478, 2046479
SM 2540 D-97	12/05/2018			12/06/2018 14:08	Yijie Li	2046478, 2046479
SM 4500 F-C-97	12/05/2018			12/11/2018 23:32	Lauren Bottorf	2046478
	12/05/2018			12/11/2018 23:43	Lauren Bottorf	2046479
SM 5310 B-00	12/05/2018			12/07/2018 03:38	Megan Treadwell	2046480
	12/05/2018			12/07/2018 04:15	Megan Treadwell	2046481