Chemical Analysis Report

WAS-SECT-2019-06-13-01

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

Event Description: **Group 2 LVI**
Request ID: **RQ-2018-10-01-20**
Customer: **WAS-SECT**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Curtis Musson

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: Colin Wright, Program Administrator

Date Certified: 25-JUN-2019 12:47

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: Ocheesee Pond Southern Lobe **Collection Date/Time: 06/12/2019 15:51**

Field ID: G2WA0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2095051	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P365607	
	EPA 300.0 Rev. 2.1	Chloride	2.6		mg Cl/L	P365811	
		Sulfate	0.20	U	mg SO4/L	P365814	
	SM 2120 B	Color (true)	87		PCU	P365603	
	SM 2320 B-97	Total Alkalinity	3.7		mg CaCO3/L	P366009	
	SM 2540 C-97	TDS	35		mg/L	P366001	
	SM 2540 D-97	TSS	2	U	mg/L	P365902	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P366012	
2095052	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P365957	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P365792	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P365759	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P365834	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P365745	
2095053	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P365613	
2095056	EPA 200.7 Rev. 4.4	Calcium	1.67		mg/L	P365602	
		Iron	260		ug/L	P365602	
		Magnesium	0.84		mg/L	P365602	
		Potassium	1.1	I	mg/L	P365602	
		Sodium	1.5	I	mg/L	P365602	
		Zinc	5.0	U	ug/L	P365602	
	EPA 200.8 Rev. 5.4	Arsenic	0.47		ug/L	P365602	
		Cadmium	0.020	U	ug/L	P365602	
		Chromium	0.40	U	ug/L	P365602	
		Copper	0.40	U	ug/L	P365602	
		Lead	0.20	U	ug/L	P365602	
		Nickel	0.50	U	ug/L	P365602	
		Silver	0.013	I	ug/L	P365602	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P365607

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P365602

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: P365602

Component	Result	Code	Units
Arsenic	0.050	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
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365811

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365814

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365957

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365792

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: P365759

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365834

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365613

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

Reference Method: SM 2120 B
Batch ID: P365603

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P366009

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

Reference Method: SM 2540 C-97
Batch ID: P366001

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P365902

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P366012

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P365745

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: P365602

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	104		P	85 - 115
Sodium	106		P	85 - 115
Zinc	94.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P365602

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	97.5		P	85 - 115
Copper	98.1		P	85 - 115
Lead	93.2		P	85 - 115
Nickel	99.7		P	85 - 115
Silver	98.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365811

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365814

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	107		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365792

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365759

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365834

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365613

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

Reference Method: SM 2120 B
Batch ID: P365603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.9		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P366009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P366012

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P365745

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P365602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2094589	Calcium	106		P	80 - 120
2094589	Iron	103		P	80 - 120
2094589	Magnesium	105		P	80 - 120
2094589	Potassium	105		P	80 - 120
2094589	Sodium	108		P	80 - 120
2094589	Zinc	95.5		P	80 - 120
2094637	Calcium	103		P	80 - 120
2094637	Iron	105	104	P/P	80 - 120
2094637	Magnesium	103	100	P/P	80 - 120
2094637	Potassium	104		P	80 - 120
2094637	Sodium	107		P	80 - 120
2094637	Zinc	96.9	94.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P365602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2094589	Arsenic	102		P	80 - 120
2094589	Cadmium	99.5		P	80 - 120
2094589	Chromium	101		P	80 - 120
2094589	Copper	101		P	80 - 120
2094589	Lead	94.4		P	80 - 120
2094589	Nickel	101		P	80 - 120
2094589	Silver	98.9		P	80 - 120
2094637	Arsenic	102	100	P/P	80 - 120
2094637	Cadmium	102	99.8	P/P	80 - 120
2094637	Chromium	101	98.3	P/P	80 - 120
2094637	Copper	101	98.3	P/P	80 - 120
2094637	Lead	96.5	94.1	P/P	80 - 120
2094637	Nickel	101	98.6	P/P	80 - 120
2094637	Silver	101	99.9	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095051	Chloride	99.7		P	90 - 110
2095133	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365814

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095051	Sulfate	101		P	90 - 110
2095133	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2094831	Ammonia-N	107	108	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095062	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095052	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365834

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095062	Total-P	107	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095053	O-Phosphate-P	91.6	91.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P366012

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095059	Fluoride	97.6	97.6	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P365745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095062	Organic Carbon	96.2	96.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P365607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095133	Turbidity	0.583	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P365602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2094637	Calcium	0.940	Spike	P	0 - 20
2094637	Iron	1.20	Spike	P	0 - 20
2094637	Magnesium	1.10	Spike	P	0 - 20
2094637	Potassium	1.18	Spike	P	0 - 20
2094637	Sodium	0.602	Spike	P	0 - 20
2094637	Zinc	2.06	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P365602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2094637	Arsenic	2.42	Spike	P	0 - 20
2094637	Cadmium	2.62	Spike	P	0 - 20
2094637	Chromium	2.90	Spike	P	0 - 20
2094637	Copper	2.86	Spike	P	0 - 20
2094637	Lead	2.55	Spike	P	0 - 20
2094637	Nickel	2.54	Spike	P	0 - 20
2094637	Silver	0.684	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095133	Chloride	0.958	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P365814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095133	Sulfate	1.29	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2094831	Ammonia-N	1.34	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095062	Kjeldahl Nitrogen	0.971	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095052	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365834

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095062	Total-P	6.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095053	O-Phosphate-P	0.109	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P365603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095108	Color (true)	1.86	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P366009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095059	Total Alkalinity	1.15	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P366001

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095133	TDS	3.92	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P365902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095133	TSS	3.45	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P366012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095059	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P365745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2095062	Organic Carbon	0.0520	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: A92083
Included Lab Sample IDs: 2095051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A92084
Included Lab Sample IDs: 2095051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A92086
Included Lab Sample IDs: 2095053

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	96.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A92126
Included Lab Sample IDs: 2095056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	105	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	104	105	P/P	90 - 110
Sodium	105	108	P/P	90 - 110
Zinc	97.6	97.4	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A92138
Included Lab Sample IDs: 2095052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	95.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A92141
Included Lab Sample IDs: 2095052

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A92153
Included Lab Sample IDs: 2095056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.5	P/P	90 - 110
Cadmium	99.5	99.7	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Copper	100	99.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A92153
Included Lab Sample IDs: 2095056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.3	94.1	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	97.4	96.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A92171
Included Lab Sample IDs: 2095051

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A92208
Included Lab Sample IDs: 2095052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.9	96.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A92212
Included Lab Sample IDs: 2095052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	109	109	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A92228
Included Lab Sample IDs: 2095051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A92228
Included Lab Sample IDs: 2095051

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A92231
Included Lab Sample IDs: 2095052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	99.0	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						0.583	
EPA 200.7 Rev. 4.4	Calcium	102	106	103				0.940
	Iron	104	103	105	104			1.20
	Magnesium	106	105	103	100			1.10
	Potassium	104	105	104				1.18
	Sodium	106	108	107				0.602
	Zinc	94.3	95.5	96.9	94.9			2.06
EPA 200.8 Rev. 5.4	Arsenic	101	102	102	100			2.42
	Cadmium	99.5	99.5	102	99.8			2.62
	Chromium	97.5	101	101	98.3			2.90
	Copper	98.1	101	101	98.3			2.86
	Lead	93.2	94.4	96.5	94.1			2.55
	Nickel	99.7	101	101	98.6			2.54
	Silver	98.4	98.9	101	99.9			0.684
EPA 300.0 Rev. 2.1	Chloride	100	100	99.7			0.958	
	Sulfate	100	101	101			1.29	
EPA 350.1 Rev. 2.0	Ammonia-N	107	107	108				1.34
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.5	102	101				0.971
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101				0.484
EPA 365.1 Rev. 2.0	Total-P	103	107	99.7				6.41
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.0	91.6	91.7				0.109
SM 2120 B	Color (true)	99.9					1.86	
SM 2320 B-97	Total Alkalinity	102					1.15	
SM 2540 C-97	TDS						3.92	
SM 2540 D-97	TSS						3.45	
SM 4500 F-C-97	Fluoride	98.5	97.6	97.6				0.0
SM 5310 B-00	Organic Carbon	95.7	96.2	96.2				0.0520

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2095051
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2095056
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2095056
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2095051
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2095051
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2095052
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2095052
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2095052
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2095052
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2095053
SM 2120 B / E31780	True Color measured at 450 nm	2095051
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2095051
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2095051
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2095051

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2095051
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2095052

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	06/13/2019			06/13/2019 15:49	Julia Storbeck	2095051
EPA 200.7 Rev. 4.4	06/13/2019	06/13/2019 16:20	Elliott D. Healy	06/14/2019 20:29	Betina Topolski	2095056
EPA 200.8 Rev. 5.4	06/13/2019	06/13/2019 16:20	Elliott D. Healy	06/17/2019 21:47	Robert K Palmer	2095056
EPA 300.0 Rev. 2.1	06/13/2019			06/17/2019 23:02	Lipi Saha	2095051
EPA 350.1 Rev. 2.0	06/13/2019			06/19/2019 13:52	Ping Hua	2095052
EPA 351.2 Rev. 2.0	06/13/2019	06/18/2019 10:31	Sima Feizi	06/19/2019 09:55	Joseph Suarez	2095052
EPA 353.2 Rev. 2.0	06/13/2019			06/17/2019 12:26	Beverly Y. Sanders	2095052
EPA 365.1 Rev. 2.0	06/13/2019	06/18/2019 12:55	Sima Feizi	06/20/2019 12:22	Lipi Saha	2095052
EPA 365.1 Rev. 2.0 dissolved	06/13/2019			06/13/2019 15:23	Jhamieka S. Greenwood	2095053
SM 2120 B	06/13/2019			06/13/2019 15:30	Mariam Hanna	2095051
SM 2320 B-97	06/13/2019			06/19/2019 10:22	Dale L. Simmons	2095051
SM 2540 C-97	06/13/2019			06/14/2019 17:01	Rosalyn Ballman	2095051
SM 2540 D-97	06/13/2019			06/14/2019 17:01	Rosalyn Ballman	2095051
SM 4500 F-C-97	06/13/2019			06/19/2019 10:22	Dale L. Simmons	2095051
SM 5310 B-00	06/13/2019			06/14/2019 10:03	Julia Storbeck	2095052