

Chemical Analysis Report

CEN-DIST-2019-08-29-01

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

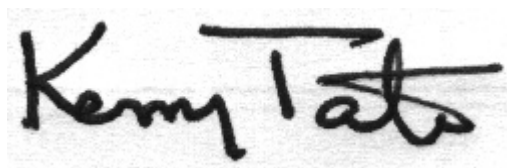
Event Description: **Puzzle Drain / Ruth / Fox**
Request ID: **RQ-2019-08-26-51**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 18-SEP-2019 11:38

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the "T" and a long horizontal stroke at the end.

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: Saint Johns River @ 300m DS of Hatbill Park Ramp

Collection Date/Time: 08/28/2019 10:33

Field ID: G3CE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115502	EPA 180.1 Rev. 2.0	Turbidity	8.8	A	NTU	P369966	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P370214	
		Sulfate	26		mg SO4/L	P370217	
	SM 2120 B	Color (true)	470		PCU	P369943	
	SM 2320 B-97	Total Alkalinity	61		mg CaCO3/L	P370197	
	SM 2540 C-97	TDS	476		mg/L	P370142	
	SM 2540 D-97	TSS	2	U	mg/L	P370057	
	SM 4500 F-C-97	Fluoride	0.093	I	mg F/L	P370202	
2115503	EPA 350.1 Rev. 2.0	Ammonia-N	0.072		mg N/L	P370237	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P369910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370064	
	EPA 365.1 Rev. 2.0	Total-P	0.32		mg P/L	P370095	
	SM 5310 B-00	Organic Carbon	34		mg C/L	P370115	
2115504	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.23		mg P/L	P369958	
2115515	EPA 200.7 Rev. 4.4	Barium	26.5		ug/L	P370126	
		Calcium	38.0		mg/L	P370126	
		Iron	1.52E+03		ug/L	P370126	
		Magnesium	12.1		mg/L	P370126	
		Potassium	5.4		mg/L	P370126	
		Sodium	87.0		mg/L	P370126	
		Zinc	5.0	U	ug/L	P370126	
	EPA 200.8 Rev. 5.4	Aluminum	65		ug/L	P370126	
		Antimony	0.071	I	ug/L	P370126	
		Arsenic	1.25		ug/L	P370126	
		Boron**	45.5		ug/L	P370126	
		Cadmium	0.020	U	ug/L	P370126	
		Chromium	0.40	U	ug/L	P370126	
		Copper	0.40	U	ug/L	P370126	
		Lead	0.20	U	ug/L	P370126	
		Nickel	0.50	U	ug/L	P370126	
		Selenium	0.20	U	ug/L	P370126	
		Silver	0.010	U	ug/L	P370126	
		Thallium	0.10	U	ug/L	P370126	

Ref. Method and Comment:

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

Sample Location: Fox Lake @ Center of West Lobe

Collection Date/Time: 08/28/2019 11:29

Field ID: G3CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115505	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P369966	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P370214	
		Sulfate	18		mg SO4/L	P370217	
	SM 2120 B	Color (true)	420		PCU	P369943	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P370197	
	SM 2540 C-97	TDS	398	A	mg/L	P370142	
	SM 2540 D-97	TSS	2	UA	mg/L	P370057	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P370202	
2115507	EPA 350.1 Rev. 2.0	Ammonia-N	0.068		mg N/L	P370237	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P369910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P370064	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P370095	
	SM 5310 B-00	Organic Carbon	30		mg C/L	P370115	
2115509	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.026		mg P/L	P369958	

Ref. Method and Comment:

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

Sample Location: Ruth Lake @ Center

Collection Date/Time: 08/28/2019 10:18

Field ID: G3CE0021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115506	EPA 180.1 Rev. 2.0	Turbidity	6.4		NTU	P369966	
	EPA 300.0 Rev. 2.1	Chloride	220		mg Cl/L	P370214	
		Sulfate	28		mg SO4/L	P370217	
	SM 2120 B	Color (true)	500		PCU	P369943	
	SM 2320 B-97	Total Alkalinity	59		mg CaCO3/L	P370197	
	SM 2540 C-97	TDS	553		mg/L	P370142	
	SM 2540 D-97	TSS	3	I	mg/L	P370057	
	SM 4500 F-C-97	Fluoride	0.083	I	mg F/L	P370202	
2115508	EPA 350.1 Rev. 2.0	Ammonia-N	0.039		mg N/L	P370237	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2		mg N/L	P369910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370064	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P370095	
	SM 5310 B-00	Organic Carbon	34		mg C/L	P370115	
2115510	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P369958	

Ref. Method and Comment:

SM 2540 D-97: 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: P369966

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370126

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
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: P370126

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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: P370214

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370217

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370237

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: P369910

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370064

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370095

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369958

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

Reference Method: SM 2120 B
Batch ID: P369943

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P370197

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

Reference Method: SM 2540 C-97
Batch ID: P370142

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P370057

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P370202

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P370115

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: P370126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	110		P	85 - 115
Iron	111		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	107		P	85 - 115
Sodium	107		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	95.6		P	85 - 115
Arsenic	97.0		P	85 - 115
Boron	103		P	85 - 115
Cadmium	97.6		P	85 - 115
Chromium	93.3		P	85 - 115
Copper	95.6		P	85 - 115
Lead	94.0		P	85 - 115
Nickel	95.7		P	85 - 115
Selenium	95.8		P	85 - 115
Silver	100		P	85 - 115
Thallium	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370214

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370217

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370237

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369910

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370064

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: P370095

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369958

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P369943

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.3		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P370197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P370202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P370115

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P370126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116008	Barium	107	104	P/P	80 - 120
2116008	Calcium	109		P	80 - 120
2116008	Iron	109	109	P/P	80 - 120
2116008	Magnesium	109	108	P/P	80 - 120
2116008	Potassium	107	107	P/P	80 - 120
2116008	Sodium	109	109	P/P	80 - 120
2116008	Zinc	104	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P370126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116008	Aluminum	95.6	95.3	P/P	80 - 120
2116008	Antimony	96.8	97.1	P/P	80 - 120
2116008	Arsenic	98.1	98.3	P/P	80 - 120
2116008	Boron	99.3	101	P/P	80 - 120
2116008	Cadmium	99.0	99.9	P/P	80 - 120
2116008	Chromium	94.5	94.8	P/P	80 - 120
2116008	Copper	93.7	94.9	P/P	80 - 120
2116008	Lead	95.6	96.2	P/P	80 - 120
2116008	Nickel	94.3	95.0	P/P	80 - 120
2116008	Selenium	95.1	92.3	P/P	80 - 120
2116008	Silver	99.8	99.3	P/P	80 - 120
2116008	Thallium	101	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P370214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115341	Chloride	101	104	P/P	90 - 110
2115493	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P370217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115341	Sulfate	101	104	P/P	90 - 110
2115493	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P370237

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115536	Ammonia-N	99.3	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P369910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115537	Kjeldahl Nitrogen	102	98.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115494	NO2NO3-N	94.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115537	Total-P	100	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369958

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115464	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P370202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115450	Fluoride	94.7	94.7	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P370115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115476	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115502	Turbidity	4.45	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116008	Barium	1.95	Spike	P	0 - 20
2116008	Calcium	1.22	Spike	P	0 - 20
2116008	Iron	0.222	Spike	P	0 - 20
2116008	Magnesium	0.402	Spike	P	0 - 20
2116008	Potassium	0.364	Spike	P	0 - 20
2116008	Sodium	0.209	Spike	P	0 - 20
2116008	Zinc	1.85	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116008	Aluminum	0.268	Spike	P	0 - 20
2116008	Antimony	0.298	Spike	P	0 - 20
2116008	Arsenic	0.174	Spike	P	0 - 20
2116008	Boron	1.74	Spike	P	0 - 20
2116008	Cadmium	0.910	Spike	P	0 - 20
2116008	Chromium	0.317	Spike	P	0 - 20
2116008	Copper	1.25	Spike	P	0 - 20
2116008	Lead	0.653	Spike	P	0 - 20
2116008	Nickel	0.754	Spike	P	0 - 20
2116008	Selenium	2.99	Spike	P	0 - 20
2116008	Silver	0.544	Spike	P	0 - 20
2116008	Thallium	2.56	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115341	Chloride	1.95	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115341	Sulfate	2.59	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115536	Ammonia-N	0.986	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115537	Kjeldahl Nitrogen	2.54	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115494	NO2NO3-N	0.181	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115537	Total-P	6.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115464	O-Phosphate-P	1.88	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P369943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115451	Color (true)	0.838	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P370197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115450	Total Alkalinity	0.287	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P370142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115505	TDS	0.503	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P370202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115450	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P370115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115476	Organic Carbon	0.0	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: A93891

Included Lab Sample IDs: 2115502, 2115505, 2115506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93904

Included Lab Sample IDs: 2115504, 2115509, 2115510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.2	P/P	90 - 110
O-Phosphate-P	98.9	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A93907

Included Lab Sample IDs: 2115502, 2115505, 2115506

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93934

Included Lab Sample IDs: 2115503, 2115507, 2115508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93955

Included Lab Sample IDs: 2115503, 2115507, 2115508

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

Reference Method: SM 5310 B-00

Run ID: A93968

Included Lab Sample IDs: 2115503, 2115507, 2115508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	106	P/P	90 - 110
Organic Carbon	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93995

Included Lab Sample IDs: 2115503, 2115507, 2115508

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

Reference Method: SM 2320 B-97

Run ID: A94004

Included Lab Sample IDs: 2115502, 2115505, 2115506

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

Reference Method: SM 2320 B-97

Run ID: A94004

Included Lab Sample IDs: 2115502, 2115505, 2115506

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

Reference Method: SM 4500 F-C-97

Run ID: A94004

Included Lab Sample IDs: 2115502, 2115505, 2115506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.1	98.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94012

Included Lab Sample IDs: 2115502, 2115505, 2115506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94019

Included Lab Sample IDs: 2115503, 2115507, 2115508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	102	P/P	90 - 110
Ammonia-N	102	102	P/P	90 - 110
Ammonia-N	95.9	98.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94050

Included Lab Sample IDs: 2115515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	99.7	100	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94206

Included Lab Sample IDs: 2115515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.2	97.2	P/P	90 - 110
Antimony	96.3	95.9	P/P	90 - 110
Arsenic	99.7	101	P/P	90 - 110
Boron	103	100	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Copper	98.8	99.7	P/P	90 - 110
Lead	97.5	97.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94206

Included Lab Sample IDs: 2115515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	99.4	99.3	P/P	90 - 110
Selenium	99.8	98.9	P/P	90 - 110
Silver	99.0	98.4	P/P	90 - 110
Thallium	94.3	95.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94208

Included Lab Sample IDs: 2115515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.0	99.6	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					4.45	
EPA 200.7 Rev. 4.4	Barium	106	107	104			1.95
	Calcium	110	109				1.22
	Iron	111	109	109			0.222
	Magnesium	112	109	108			0.402
	Potassium	107	107	107			0.364
	Sodium	107	109	109			0.209
	Zinc	104	104	102			1.85
EPA 200.8 Rev. 5.4	Aluminum	95.3	95.6	95.3			0.268
	Antimony	95.6	96.8	97.1			0.298
	Arsenic	97.0	98.1	98.3			0.174
	Boron	103	99.3	101			1.74
	Cadmium	97.6	99.0	99.9			0.910
	Chromium	93.3	94.5	94.8			0.317
	Copper	95.6	93.7	94.9			1.25
	Lead	94.0	95.6	96.2			0.653
	Nickel	95.7	94.3	95.0			0.754
	Selenium	95.8	95.1	92.3			2.99
	Silver	100	99.8	99.3			0.544
	Thallium	98.3	101	103			2.56
EPA 300.0 Rev. 2.1	Chloride	101	101	104	102		1.95
	Sulfate	102	101	104	100		2.59
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.3	101			0.986
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	98.1			2.54
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	94.5				0.181
EPA 365.1 Rev. 2.0	Total-P	99.3	100	108			6.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	100	102			1.88
SM 2120 B	Color (true)	99.3				0.838	
SM 2320 B-97	Total Alkalinity	104				0.287	
SM 2540 C-97	TDS					0.503	
SM 4500 F-C-97	Fluoride	97.1	94.7	94.7			0.0
SM 5310 B-00	Organic Carbon	102	102	102			0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2115502, 2115505, 2115506
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2115515
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2115515
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2115502, 2115505, 2115506
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2115502, 2115505, 2115506
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2115503, 2115507, 2115508
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2115503, 2115507, 2115508
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2115503, 2115507, 2115508
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2115503, 2115507, 2115508

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2115504, 2115509, 2115510
SM 2120 B / E31780	True Color measured at 450 nm	2115502, 2115505, 2115506
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2115502, 2115505, 2115506
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2115502, 2115505, 2115506
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2115502, 2115505, 2115506
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2115502, 2115505, 2115506
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2115503, 2115507, 2115508

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	08/29/2019			08/29/2019 17:38	Rosalyn Ballman	2115502, 2115505, 2115506
EPA 200.7 Rev. 4.4	08/29/2019	09/04/2019 13:30	Elliott D. Healy	09/06/2019 14:57	Alexander Thompson	2115515
EPA 200.8 Rev. 5.4	08/29/2019	09/04/2019 13:30	Elliott D. Healy	09/12/2019 20:40	Robert K Palmer	2115515
	08/29/2019	09/04/2019 13:30	Elliott D. Healy	09/14/2019 03:00	Robert K Palmer	2115515
EPA 300.0 Rev. 2.1	08/29/2019			09/05/2019 01:27	Jhamieka S. Greenwood	2115502
	08/29/2019			09/05/2019 01:39	Jhamieka S. Greenwood	2115505
	08/29/2019			09/05/2019 01:51	Jhamieka S. Greenwood	2115506
EPA 350.1 Rev. 2.0	08/29/2019			09/05/2019 13:10	Ping Hua	2115507
	08/29/2019			09/05/2019 13:17	Ping Hua	2115508
	08/29/2019			09/05/2019 14:37	Ping Hua	2115503
EPA 351.2 Rev. 2.0	08/29/2019	08/29/2019 13:50	Sima Feizi	08/30/2019 15:27	Joseph Suarez	2115503
	08/29/2019	08/29/2019 13:50	Sima Feizi	08/30/2019 15:28	Joseph Suarez	2115507
	08/29/2019	08/29/2019 13:50	Sima Feizi	08/30/2019 15:30	Joseph Suarez	2115508
EPA 353.2 Rev. 2.0	08/29/2019			09/03/2019 12:50	Beverly Y. Sanders	2115503
	08/29/2019			09/03/2019 12:51	Beverly Y. Sanders	2115507
	08/29/2019			09/03/2019 12:53	Beverly Y. Sanders	2115508
EPA 365.1 Rev. 2.0	08/29/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 10:31	Lipi Saha	2115503
	08/29/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 10:32	Lipi Saha	2115507
	08/29/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 10:33	Lipi Saha	2115508
EPA 365.1 Rev. 2.0 dissolved	08/29/2019			08/29/2019 17:58	Jhamieka S. Greenwood	2115509
	08/29/2019			08/29/2019 18:00	Jhamieka S. Greenwood	2115510
	08/29/2019			08/29/2019 18:18	Jhamieka S. Greenwood	2115504
SM 2120 B	08/29/2019			08/29/2019 17:05	Madeline Funaro	2115502
	08/29/2019			08/29/2019 17:06	Madeline Funaro	2115505
	08/29/2019			08/29/2019 17:07	Madeline Funaro	2115506
SM 2320 B-97	08/29/2019			09/04/2019 02:25	Dale L. Simmons	2115502
	08/29/2019			09/04/2019 02:38	Dale L. Simmons	2115505
	08/29/2019			09/04/2019 02:50	Dale L. Simmons	2115506
SM 2540 C-97	08/29/2019			08/30/2019 17:48	Rosalyn Ballman	2115502, 2115505, 2115506
SM 2540 D-97	08/29/2019			08/30/2019 17:48	Rosalyn Ballman	2115502, 2115505, 2115506
SM 4500 F-C-97	08/29/2019			09/04/2019 02:25	Dale L. Simmons	2115502
	08/29/2019			09/04/2019 02:38	Dale L. Simmons	2115505
	08/29/2019			09/04/2019 02:50	Dale L. Simmons	2115506
SM 5310 B-00	08/29/2019			09/03/2019 19:10	Madeline Funaro	2115503
	08/29/2019			09/03/2019 19:24	Madeline Funaro	2115507
	08/29/2019			09/03/2019 20:04	Madeline Funaro	2115508