Chemical Analysis Report

CEN-DIST-2018-03-01-03

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

Event Description: **SJR bw Lk Harney X2 + D&B**
Request ID: **RQ-2018-02-12-58**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 06-APR-2018 12:09

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 HARNEY OUTFALL IN CENTER OF ST. JOHNS RIVER **Collection Date/Time: 02/28/2018 11:40**

Field ID: G2CE0173 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1971024	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P340810	
	EPA 300.0 Rev. 2.1	Chloride	250		mg Cl/L	P341032	
		Sulfate	60		mg SO4/L	P341033	
	SM 2120 B	Color (true)	150		PCU	P340815	
	SM 2320 B-97	Total Alkalinity	67		mg CaCO3/L	P341245	
	SM 2540 C-97	TDS	605		mg/L	P341153	
	SM 2540 D-97	TSS	2	I	mg/L	P340936	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P341248	
1971025	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P340976	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P340903	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P340888	
	EPA 365.1 Rev. 2.0	Total-P	0.067		mg P/L	P340869	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P340979	
1971026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P340822	
1971029	EPA 200.7 Rev. 4.4	Calcium	50.4		mg/L	P340962	
		Iron	460		ug/L	P340962	
		Magnesium	18.8		mg/L	P340962	
		Potassium	6.5		mg/L	P340962	
		Sodium	138		mg/L	P340962	
		Zinc	5.0	U	ug/L	P340962	
	EPA 200.8 Rev. 5.4	Arsenic	0.67		ug/L	P340962	
		Cadmium	0.020	U	ug/L	P340962	
		Chromium	0.40	U	ug/L	P340962	
		Copper	0.60	I	ug/L	P341619	
		Lead	0.37		ug/L	P341619	
		Nickel	0.51	I	ug/L	P341619	
		Silver	0.010	U	ug/L	P340962	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low 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.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P340810

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340962

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340962

Component	Result	Code	Units
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: P340962

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341619

Component	Result	Code	Units
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341032

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341033

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340976

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340903

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340888

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340869

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340822

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

Reference Method: SM 2120 B
Batch ID: P340815

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341245

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

Reference Method: SM 2540 C-97
Batch ID: P341153

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P340936

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P341248

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P340979

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: P340962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.4		P	85 - 115
Iron	107		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	99.6		P	85 - 115
Zinc	98.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	106		P	85 - 115
Chromium	103		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341619

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	100		P	85 - 115
Lead	101		P	85 - 115
Nickel	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341032

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341033

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340903

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340888

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340822

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

Reference Method: SM 2320 B-97
Batch ID: P341245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P341248

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P340979

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1971143	Calcium	99.8		P	80 - 120
1971143	Iron	107		P	80 - 120
1971143	Magnesium	104		P	80 - 120
1971143	Potassium	101		P	80 - 120
1971143	Sodium	100		P	80 - 120
1971143	Zinc	99.9		P	80 - 120
1971385	Calcium	101		P	80 - 120
1971385	Iron	108	109	P/P	80 - 120
1971385	Magnesium	101		P	80 - 120
1971385	Potassium	101		P	80 - 120
1971385	Sodium	100		P	80 - 120
1971385	Zinc	93.8	99.7	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1971143	Arsenic	102		P	80 - 120
1971143	Cadmium	106		P	80 - 120
1971143	Chromium	98.7		P	80 - 120
1971143	Silver	101		P	80 - 120
1971385	Arsenic	100	101	P/P	80 - 120
1971385	Cadmium	104	104	P/P	80 - 120
1971385	Chromium	96.3	97.5	P/P	80 - 120
1971385	Silver	102	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341619

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970527	Copper	97.0	100	P/P	80 - 120
1970527	Lead	103	103	P/P	80 - 120
1970527	Nickel	98.7	97.1	P/P	80 - 120
1970913	Copper	101		P	80 - 120
1970913	Lead	105		P	80 - 120
1970913	Nickel	99.1		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970943	Chloride	93.2		P	90 - 110
1970950	Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970943	Sulfate	96.1		P	90 - 110
1970950	Sulfate	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970955	Ammonia-N	94.0	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1971092	Kjeldahl Nitrogen	97.9	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1971025	NO2NO3-N	101	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340822

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970956	O-Phosphate-P	94.7	93.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P341248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970876	Fluoride	96.9	95.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P340979

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1970944	Organic Carbon	97.6	99.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P340810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970943	Turbidity	3.07	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1971385	Calcium	1.22	Spike	P	0 - 20
1971385	Iron	1.24	Spike	P	0 - 20
1971385	Magnesium	1.74	Spike	P	0 - 20
1971385	Potassium	1.70	Spike	P	0 - 20
1971385	Sodium	1.39	Spike	P	0 - 20
1971385	Zinc	6.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1971385	Arsenic	0.990	Spike	P	0 - 20
1971385	Cadmium	0.0614	Spike	P	0 - 20
1971385	Chromium	1.20	Spike	P	0 - 20
1971385	Silver	0.496	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970527	Copper	3.37	Spike	P	0 - 20
1970527	Lead	0.461	Spike	P	0 - 20
1970527	Nickel	1.64	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970943	Chloride	1.65	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970943	Sulfate	1.53	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970955	Ammonia-N	2.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1971092	Kjeldahl Nitrogen	0.211	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1971025	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970955	Total-P	1.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970956	O-Phosphate-P	0.495	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P340815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970943	Color (true)	0.509	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970876	Total Alkalinity	0.128	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P341153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1971100	TDS	0.800	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P341248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970876	Fluoride	0.960	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P340979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1970944	Organic Carbon	0.860	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: EPA 180.1 Rev. 2.0
Run ID: A82369
Included Lab Sample IDs: 1971024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A82370
Included Lab Sample IDs: 1971024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.9	99.6	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82372
Included Lab Sample IDs: 1971026

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82408
Included Lab Sample IDs: 1971025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A82419
Included Lab Sample IDs: 1971025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.6	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A82431
Included Lab Sample IDs: 1971025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A82435
Included Lab Sample IDs: 1971025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.3	96.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A82457
Included Lab Sample IDs: 1971024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.1	98.6	P/P	90 - 110
Sulfate	96.3	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A82467
Included Lab Sample IDs: 1971025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A82512
Included Lab Sample IDs: 1971029

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

Reference Method: SM 2320 B-97
Run ID: A82513
Included Lab Sample IDs: 1971024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	99.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A82513
Included Lab Sample IDs: 1971024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	109	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82540
Included Lab Sample IDs: 1971029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.9	98.3	P/P	90 - 110
Cadmium	99.1	99.2	P/P	90 - 110
Chromium	97.0	95.0	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82829
Included Lab Sample IDs: 1971029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	93.4	95.9	P/P	90 - 110
Nickel	97.5	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82847
Included Lab Sample IDs: 1971029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.5	99.9	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						3.07	
EPA 200.7 Rev. 4.4	Calcium	99.4	99.8	101				1.22
	Iron	107	107	108	109			1.24
	Magnesium	103	104	101				1.74
	Potassium	102	101	101				1.70
	Sodium	99.6	100	100				1.39
	Zinc	98.8	99.9	93.8	99.7			6.12
EPA 200.8 Rev. 5.4	Arsenic	103	102	100	101			0.990
	Cadmium	106	106	104	104			0.0614
	Chromium	103	98.7	96.3	97.5			1.20
	Copper	100	97.0	100	101			3.37
	Lead	101	103	103	105			0.461
	Nickel	101	98.7	97.1	99.1			1.64
	Silver	103	101	102	101			0.496
EPA 300.0 Rev. 2.1	Chloride	95.1	93.2	96.3			1.65	
	Sulfate	95.8	96.1	96.3			1.53	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	94.0	96.5				2.47
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.8	97.9	97.6				0.211
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	101				0.0
EPA 365.1 Rev. 2.0	Total-P	93.6						1.79
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	94.7	93.8				0.495
SM 2120 B	Color (true)						0.509	
SM 2320 B-97	Total Alkalinity	102					0.128	
SM 2540 C-97	TDS						0.800	
SM 4500 F-C-97	Fluoride	94.9	96.9	95.4				0.960
SM 5310 B-00	Organic Carbon	95.2	97.6	99.0				0.860

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1971024
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1971029
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1971029
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1971024
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1971024
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1971025
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1971025
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1971025
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1971025
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1971026
SM 2120 B / E31780	True Color measured at 450 nm	1971024
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1971024
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1971024
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1971024
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1971024

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1971025

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	03/01/2018			03/01/2018 15:23	DeAsia Armster	1971024
EPA 200.7 Rev. 4.4	03/01/2018	03/05/2018	Elliott D. Healy	03/08/2018	Betina Topolski	1971029
EPA 200.8 Rev. 5.4	03/01/2018	03/05/2018	Elliott D. Healy	03/09/2018	Nadine Brooks	1971029
	03/01/2018	03/05/2018	Elliott D. Healy	03/23/2018	Robert K Palmer	1971029
	03/01/2018	03/15/2018	Elliott D. Healy	03/23/2018	Robert K Palmer	1971029
	03/01/2018	03/15/2018	Elliott D. Healy	03/26/2018	Robert K Palmer	1971029
EPA 300.0 Rev. 2.1	03/01/2018			03/06/2018	Lipi Saha	1971024
EPA 350.1 Rev. 2.0	03/01/2018			03/05/2018	Ping Hua	1971025
EPA 351.2 Rev. 2.0	03/01/2018	03/05/2018	Adrian Shelby	03/07/2018	Joseph Suarez	1971025
EPA 353.2 Rev. 2.0	03/01/2018			03/02/2018	Lauren Bottorf	1971025
EPA 365.1 Rev. 2.0	03/01/2018	03/02/2018	Sima Feizi	03/05/2018	Beverly Y. Sanders	1971025
EPA 365.1 Rev. 2.0 dissolved	03/01/2018			03/01/2018 16:43	Megan Treadwell	1971026
SM 2120 B	03/01/2018			03/01/2018 15:17	Tanya Welborn	1971024
SM 2320 B-97	03/01/2018			03/09/2018	Dale L. Simmons	1971024
SM 2540 C-97	03/01/2018			03/02/2018	DeAsia Armster	1971024
SM 2540 D-97	03/01/2018			03/02/2018	DeAsia Armster	1971024
SM 4500 F-C-97	03/01/2018			03/09/2018	Dale L. Simmons	1971024
SM 5310 B-00	03/01/2018			03/06/2018	Megan Treadwell	1971025