Chemical Analysis Report

CEN-DIST-2018-03-28-02

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

Event Description: **SJR (2964) (VolCo)**
Request ID: **RQ-2018-03-26-48**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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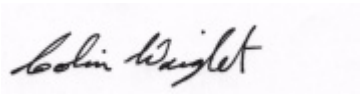
Certified by: Colin Wright, Program Administrator

Date Certified: 30-APR-2018 14:05



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 (2964) **Collection Date/Time: 03/27/2018 10:20**

Field ID: G2CE0173 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1978662	EPA 180.1 Rev. 2.0	Turbidity	5.7	A	NTU	P342359	
	EPA 300.0 Rev. 2.1	Chloride	320		mg Cl/L	P342509	
		Sulfate	77		mg SO4/L	P342513	
	SM 2120 B	Color (true)	130		PCU	P342355	
	SM 2320 B-97	Total Alkalinity	71		mg CaCO3/L	P342983	
	SM 2540 C-97	TDS	783		mg/L	P342660	
	SM 2540 D-97	TSS	5	I	mg/L	P343097	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P342987	
1978663	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P343144	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P342403	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342656	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P342724	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P342906	
1978664	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P342434	
1978667	EPA 200.7 Rev. 4.4	Calcium	56.8		mg/L	P342557	
		Iron	490		ug/L	P342557	
		Magnesium	22.2		mg/L	P342557	
		Potassium	7.2		mg/L	P342557	
		Sodium	170		mg/L	P342557	
		Zinc	5.0	U	ug/L	P342557	
	EPA 200.8 Rev. 5.4	Arsenic	0.69		ug/L	P342557	
		Cadmium	0.020	U	ug/L	P342557	
		Chromium	0.40	U	ug/L	P342557	
		Copper	0.63	I	ug/L	P342557	
		Lead	0.51		ug/L	P342557	
		Nickel	0.40	I	ug/L	P342557	
		Silver	0.010	U	ug/L	P342557	

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: P342359

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342557

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: P342557

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: P342557

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: P342509

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342513

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343144

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342403

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342656

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342724

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342434

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

Reference Method: SM 2120 B
Batch ID: P342355

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P342983

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

Reference Method: SM 2540 C-97
Batch ID: P342660

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P343097

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342987

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342906

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: P342557

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342557

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.8		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	104		P	85 - 115
Copper	97.3		P	85 - 115
Lead	101		P	85 - 115
Nickel	96.4		P	85 - 115
Silver	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342509

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342513

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343144

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342403

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342656

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: P342724

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342434

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P342983

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: P342987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342906

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979326	Calcium	106		P	80 - 120
1979326	Iron	109		P	80 - 120
1979326	Magnesium	108		P	80 - 120
1979326	Potassium	102		P	80 - 120
1979326	Sodium	107		P	80 - 120
1979326	Zinc	104		P	80 - 120
1979402	Calcium	102		P	80 - 120
1979402	Iron	106	107	P/P	80 - 120
1979402	Magnesium	106	107	P/P	80 - 120
1979402	Potassium	99.0	98.2	P/P	80 - 120
1979402	Sodium	102		P	80 - 120
1979402	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979326	Arsenic	96.7		P	80 - 120
1979326	Cadmium	105		P	80 - 120
1979326	Chromium	100		P	80 - 120
1979326	Copper	93.4		P	80 - 120
1979326	Lead	98.9		P	80 - 120
1979326	Nickel	92.3		P	80 - 120
1979326	Silver	95.6		P	80 - 120
1979402	Arsenic	97.9	96.1	P/P	80 - 120
1979402	Cadmium	103	99.5	P/P	80 - 120
1979402	Chromium	102	99.5	P/P	80 - 120
1979402	Copper	95.4	93.6	P/P	80 - 120
1979402	Lead	99.7	97.8	P/P	80 - 120
1979402	Nickel	94.5	92.1	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979402	Silver	95.1	93.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978313	Chloride	101	99.4	P/P	90 - 110
1978779	Chloride	97.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978313	Sulfate	102	99.3	P/P	90 - 110
1978779	Sulfate	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978507	Ammonia-N	97.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978678	Kjeldahl Nitrogen	96.0	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978663	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978664	O-Phosphate-P	97.7	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P342987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978937	Fluoride	95.9	99.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978807	Organic Carbon	100	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978662	Turbidity	6.15	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979402	Calcium	1.16	Spike	P	0 - 20
1979402	Iron	0.502	Spike	P	0 - 20
1979402	Magnesium	0.459	Spike	P	0 - 20
1979402	Potassium	0.464	Spike	P	0 - 20
1979402	Sodium	0.317	Spike	P	0 - 20
1979402	Zinc	0.681	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979402	Arsenic	1.70	Spike	P	0 - 20
1979402	Cadmium	3.05	Spike	P	0 - 20
1979402	Chromium	2.21	Spike	P	0 - 20
1979402	Copper	1.86	Spike	P	0 - 20
1979402	Lead	1.99	Spike	P	0 - 20
1979402	Nickel	2.51	Spike	P	0 - 20
1979402	Silver	1.71	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342509

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978313	Chloride	1.75	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978313	Sulfate	2.74	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978507	Ammonia-N	2.76	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978678	Kjeldahl Nitrogen	0.597	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978663	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978678	Total-P	1.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978664	O-Phosphate-P	0.590	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978571	Color (true)	13.5	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P342983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978937	Total Alkalinity	0.278	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978505	TDS	3.64	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978937	Fluoride	2.42	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P342906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978807	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: EPA 300.0 Rev. 2.1
Run ID: A82892
Included Lab Sample IDs: 1978662

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	99.6	P/P	90 - 110
Sulfate	99.8	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A82910
Included Lab Sample IDs: 1978662

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82911
Included Lab Sample IDs: 1978662

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: A82939
Included Lab Sample IDs: 1978664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A82965
Included Lab Sample IDs: 1978663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83012
Included Lab Sample IDs: 1978663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83016
Included Lab Sample IDs: 1978667

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	102	P/P	90 - 110
Iron	103	99.3	P/P	90 - 110
Magnesium	103	99.3	P/P	90 - 110
Potassium	101	98.8	P/P	90 - 110
Sodium	104	103	P/P	90 - 110
Zinc	100	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83040
Included Lab Sample IDs: 1978667

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.2	96.6	P/P	90 - 110
Cadmium	99.6	98.8	P/P	90 - 110
Chromium	98.1	96.7	P/P	90 - 110
Copper	91.8	93.1	P/P	90 - 110
Lead	97.4	96.6	P/P	90 - 110
Nickel	91.2	92.8	P/P	90 - 110
Silver	99.3	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83049
Included Lab Sample IDs: 1978663

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

Reference Method: SM 5310 B-00
Run ID: A83079
Included Lab Sample IDs: 1978663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.0	98.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83098
Included Lab Sample IDs: 1978662

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83098
Included Lab Sample IDs: 1978662

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83153
Included Lab Sample IDs: 1978663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.3	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						6.15	
EPA 200.7 Rev. 4.4	Calcium	105	106	102				1.16
	Iron	106	109	106	107			0.502
	Magnesium	109	108	106	107			0.459
	Potassium	102	102	99.0	98.2			0.464
	Sodium	104	107	102				0.317
	Zinc	101	104	101	102			0.681
EPA 200.8 Rev. 5.4	Arsenic	98.8	97.9	96.1	96.7			1.70
	Cadmium	104	103	99.5	105			3.05
	Chromium	104	102	99.5	100			2.21
	Copper	97.3	95.4	93.6	93.4			1.86
	Lead	101	99.7	97.8	98.9			1.99
	Nickel	96.4	94.5	92.1	92.3			2.51
	Silver	97.8	95.1	93.5	95.6			1.71
EPA 300.0 Rev. 2.1	Chloride	98.5	101	99.4	97.7			1.75
	Sulfate	101	102	99.3	99.0			2.74
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	97.2	101				2.76
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.9	96.0	96.8				0.597
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102				0.494
EPA 365.1 Rev. 2.0	Total-P	100						1.48
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.7	98.4				0.590
SM 2120 B	Color (true)						13.5	
SM 2320 B-97	Total Alkalinity	99.3					0.278	
SM 2540 C-97	TDS						3.64	
SM 4500 F-C-97	Fluoride	94.7	95.9	99.1				2.42
SM 5310 B-00	Organic Carbon	97.6	100	102				1.98

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1978662
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1978667
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1978667
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1978662

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1978662
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1978663
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1978663
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1978663
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1978663
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1978664
SM 2120 B / E31780	True Color measured at 450 nm	1978662
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1978662
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1978662
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1978662
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1978662
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1978663

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	03/28/2018			03/28/2018 15:43	DeAsia Armster	1978662
EPA 200.7 Rev. 4.4	03/28/2018	04/02/2018 13:15	Elliott D. Healy	04/03/2018 17:20	Betina Topolski	1978667
EPA 200.8 Rev. 5.4	03/28/2018	04/02/2018 13:15	Elliott D. Healy	04/04/2018 23:31	Nadine Brooks	1978667
EPA 300.0 Rev. 2.1	03/28/2018			03/30/2018 10:11	Lipi Saha	1978662
EPA 350.1 Rev. 2.0	03/28/2018			04/10/2018 10:10	Ping Hua	1978663
EPA 351.2 Rev. 2.0	03/28/2018	03/29/2018 15:30	Adrian Shelby	03/30/2018 15:30	Joseph Suarez	1978663
EPA 353.2 Rev. 2.0	03/28/2018			04/03/2018 13:29	Lauren Bottorf	1978663
EPA 365.1 Rev. 2.0	03/28/2018	04/04/2018 12:52	Sima Feizi	04/05/2018 08:59	Beverly Y. Sanders	1978663
EPA 365.1 Rev. 2.0 dissolved	03/28/2018			03/28/2018 16:01	Megan Treadwell	1978664
SM 2120 B	03/28/2018			03/28/2018 15:42	Tanya Welborn	1978662
SM 2320 B-97	03/28/2018			04/06/2018 02:54	Dale L. Simmons	1978662
SM 2540 C-97	03/28/2018			03/30/2018 16:30	Yijie Li	1978662
SM 2540 D-97	03/28/2018			03/30/2018 16:30	Yijie Li	1978662
SM 4500 F-C-97	03/28/2018			04/06/2018 02:54	Dale L. Simmons	1978662
SM 5310 B-00	03/28/2018			04/05/2018 20:48	Julia Storbeck	1978663