Chemical Analysis Report

CEN-DIST-2018-03-27-01

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

Event Description: **SJR ab Lk Woodruff + HA**
Request ID: **RQ-2018-02-26-60**
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
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 30-APR-2018 13:37

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: ST. JOHN'S RIVER @ 700M SOUTH OF LAKE DEXTER **Collection Date/Time: 03/26/2018 12:15**

Field ID: G2CE0164 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977885	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P342269	
	EPA 300.0 Rev. 2.1	Chloride	230		mg Cl/L	P342507	
		Sulfate	63		mg SO4/L	P342510	
	SM 2120 B	Color (true)	100		PCU	P342263	
	SM 2320 B-97	Total Alkalinity	86		mg CaCO3/L	P342531	RPD
	SM 2540 C-97	TDS	618		mg/L	P342575	
	SM 2540 D-97	TSS	5	I	mg/L	P342630	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P342536	
1977886	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P342681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P342281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P342336	
	EPA 365.1 Rev. 2.0	Total-P	0.073		mg P/L	P342347	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P342873	
1977887	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P342315	
1977890	EPA 200.7 Rev. 4.4	Calcium	53.1		mg/L	P342361	
		Iron	130		ug/L	P342361	
		Magnesium	19.6		mg/L	P342361	
		Potassium	5.2		mg/L	P342361	
		Sodium	125		mg/L	P342361	
		Zinc	5.0	U	ug/L	P342361	
	EPA 200.8 Rev. 5.4	Arsenic	0.65		ug/L	P342361	
		Cadmium	0.020	U	ug/L	P342361	
		Chromium	0.40	U	ug/L	P342361	
		Copper	0.45	I	ug/L	P342361	
		Lead	0.17	I	ug/L	P342361	
		Nickel	0.37	I	ug/L	P342361	
		Silver	0.010	U	ug/L	P342361	

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: P342269

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342361

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342361

Component	Result	Code	Units
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: P342361

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: P342507

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342681

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342281

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342347

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: P342315

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

Reference Method: SM 2120 B
Batch ID: P342263

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P342531

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

Reference Method: SM 2540 C-97
Batch ID: P342575

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342630

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342873

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: P342361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	108		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	108		P	85 - 115
Sodium	104		P	85 - 115
Zinc	100		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	80 - 120
Cadmium	104		P	80 - 120
Chromium	103		P	80 - 120
Copper	101		P	80 - 120
Lead	101		P	80 - 120
Nickel	100		P	80 - 120
Silver	98.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342281

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342336

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: P342347

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P342531

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978083	Calcium	102		P	80 - 120
1978083	Iron	107	108	P/P	80 - 120
1978083	Magnesium	103		P	80 - 120
1978083	Potassium	105	105	P/P	80 - 120
1978083	Sodium	104		P	80 - 120
1978083	Zinc	99.1	98.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978083	Arsenic	101	100	P/P	80 - 120
1978083	Cadmium	105	104	P/P	80 - 120
1978083	Chromium	103	103	P/P	80 - 120
1978083	Copper	96.9	96.1	P/P	80 - 120
1978083	Lead	102	102	P/P	80 - 120
1978083	Nickel	96.3	95.7	P/P	80 - 120
1978083	Silver	97.8	98.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977857	Chloride	94.2		P	90 - 110
1977934	Chloride	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977857	Sulfate	96.6		P	90 - 110
1977934	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977859	Ammonia-N	96.6	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977886	Kjeldahl Nitrogen	99.9	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977860	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977259	Total-P	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977887	O-Phosphate-P	96.7	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977936	Fluoride	97.3	97.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977219	Organic Carbon	100	99.4	P/P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977904	Turbidity	3.90	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978083	Calcium	0.0807	Spike	P	0 - 20
1978083	Iron	0.838	Spike	P	0 - 20
1978083	Magnesium	0.0799	Spike	P	0 - 20
1978083	Potassium	0.0475	Spike	P	0 - 20
1978083	Sodium	0.275	Spike	P	0 - 20
1978083	Zinc	0.347	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978083	Arsenic	0.487	Spike	P	0 - 20
1978083	Cadmium	0.743	Spike	P	0 - 20
1978083	Chromium	0.170	Spike	P	0 - 20
1978083	Copper	0.820	Spike	P	0 - 20
1978083	Lead	0.0379	Spike	P	0 - 20
1978083	Nickel	0.559	Spike	P	0 - 20
1978083	Silver	0.787	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977857	Chloride	0.757	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977857	Sulfate	0.948	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977859	Ammonia-N	0.483	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977886	Kjeldahl Nitrogen	0.547	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977860	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977259	Total-P	0.368	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977887	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977858	Color (true)	2.77	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P342531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Total Alkalinity	4.10	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977923	TDS	3.82	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Fluoride	0.479	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P342873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977219	Organic Carbon	0.592	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: A82875
Included Lab Sample IDs: 1977885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	98.4	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82876
Included Lab Sample IDs: 1977885

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A82892
Included Lab Sample IDs: 1977885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	98.6	P/P	90 - 110
Sulfate	98.0	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82895
Included Lab Sample IDs: 1977887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82906
Included Lab Sample IDs: 1977886

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A82915
Included Lab Sample IDs: 1977886

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A82953
Included Lab Sample IDs: 1977890

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A82956
Included Lab Sample IDs: 1977886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A82967
Included Lab Sample IDs: 1977885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A82967
Included Lab Sample IDs: 1977885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83017
Included Lab Sample IDs: 1977886

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83063
Included Lab Sample IDs: 1977890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.4	97.1	P/P	90 - 110
Cadmium	99.6	98.7	P/P	90 - 110
Chromium	99.5	101	P/P	90 - 110
Copper	97.2	96.7	P/P	90 - 110
Lead	97.9	98.3	P/P	90 - 110
Nickel	96.8	97.1	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A83069
Included Lab Sample IDs: 1977886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.5	96.0	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					3.90	
EPA 200.7 Rev. 4.4	Calcium	104	102				0.0807
	Iron	108	107	108			0.838
	Magnesium	105	103				0.0799
	Potassium	108	105	105			0.0475
	Sodium	104	104				0.275
	Zinc	100	99.1	98.8			0.347
EPA 200.8 Rev. 5.4	Arsenic	101	101	100			0.487
	Cadmium	104	105	104			0.743
	Chromium	103	103	103			0.170
	Copper	101	96.9	96.1			0.820
	Lead	101	102	102			0.0379
	Nickel	100	96.3	95.7			0.559
	Silver	98.5	97.8	98.6			0.787
EPA 300.0 Rev. 2.1	Chloride	97.4	94.2	96.5		0.757	
	Sulfate	97.7	96.6	97.1		0.948	
EPA 350.1 Rev. 2.0	Ammonia-N	96.9	96.6	97.1			0.483
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.6	99.9	101			0.547
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	101	103	103			0.368
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	96.7	98.0			1.01
SM 2120 B	Color (true)					2.77	
SM 2320 B-97	Total Alkalinity	100				4.10	
SM 2540 C-97	TDS					3.82	
SM 4500 F-C-97	Fluoride	95.6	97.3	97.8			0.479
SM 5310 B-00	Organic Carbon	96.9	100	99.4			0.592

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1977885
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1977890
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1977890
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1977885

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1977885
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1977886
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1977886
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1977886
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1977886
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1977887
SM 2120 B / E31780	True Color measured at 450 nm	1977885
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1977885
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1977885
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1977885
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1977885
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1977886

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	03/27/2018			03/27/2018 15:15	DeAsia Armster	1977885
EPA 200.7 Rev. 4.4	03/27/2018	03/28/2018 17:05	Elliott D. Healy	03/29/2018 15:34	Martin Acosta	1977890
EPA 200.8 Rev. 5.4	03/27/2018	03/28/2018 17:05	Elliott D. Healy	04/05/2018 19:03	Nadine Brooks	1977890
EPA 300.0 Rev. 2.1	03/27/2018			03/29/2018 19:13	Lipi Saha	1977885
EPA 350.1 Rev. 2.0	03/27/2018			04/03/2018 14:42	Ping Hua	1977886
EPA 351.2 Rev. 2.0	03/27/2018	03/28/2018 10:40	Adrian Shelby	03/30/2018 09:27	Joseph Suarez	1977886
EPA 353.2 Rev. 2.0	03/27/2018			03/28/2018 11:48	Lauren Bottorf	1977886
EPA 365.1 Rev. 2.0	03/27/2018	03/28/2018 13:55	Sima Feizi	03/29/2018 07:41	Beverly Y. Sanders	1977886
EPA 365.1 Rev. 2.0 dissolved	03/27/2018			03/27/2018 15:00	Megan Treadwell	1977887
SM 2120 B	03/27/2018			03/27/2018 15:23	Tanya Welborn	1977885
SM 2320 B-97	03/27/2018			03/31/2018 02:58	Lauren Bottorf	1977885
SM 2540 C-97	03/27/2018			03/28/2018 15:49	Yijie Li	1977885
SM 2540 D-97	03/27/2018			03/28/2018 15:49	Yijie Li	1977885
SM 4500 F-C-97	03/27/2018			03/31/2018 02:58	Lauren Bottorf	1977885
SM 5310 B-00	03/27/2018			04/04/2018 21:14	Julia Storbeck	1977886