

Chemical Analysis Report

SW-DIST-2018-12-06-01

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

Event Description: **Little Manatee HA**
Request ID: **RQ-2018-12-03-66**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Ben Paswater

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 07-JAN-2019 12:18

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: Little manatee River at SP Boat Ramp

Collection Date/Time: 12/05/2018 12:20

Field ID: G2SW0037

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2046913	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P355757	
	EPA 300.0 Rev. 2.1	Chloride	18	A	mg Cl/L	P355991	
		Sulfate	68	A	mg SO4/L	P355992	
	SM 2120 B	Color (true)	54		PCU	P355783	
	SM 2320 B-97	Total Alkalinity	42		mg CaCO3/L	P355947	
	SM 2540 C-97	TDS	202		mg/L	P356302	
	SM 2540 D-97	TSS	2	I	mg/L	P356080	
	SM 4500 F-C-97	Fluoride	0.32		mg F/L	P355950	
2046914	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P355907	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P356223	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.61		mg N/L	P355842	
	EPA 365.1 Rev. 2.0	Total-P	0.27		mg P/L	P355900	
	SM 5310 B-00	Organic Carbon	8.7		mg C/L	P355956	
2046915	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P355763	
2046918	EPA 200.7 Rev. 4.4	Calcium	26.9		mg/L	P355896	
		Iron	170		ug/L	P355896	
		Magnesium	11.8		mg/L	P355896	
		Potassium	5.7		mg/L	P355896	
		Sodium	10.3		mg/L	P355896	
		Zinc	5.0	U	ug/L	P355896	
	EPA 200.8 Rev. 5.4	Arsenic	0.67		ug/L	P355896	
		Cadmium	0.041	I	ug/L	P355896	
		Chromium	0.63	I	ug/L	P355896	
		Copper	1.81		ug/L	P356654	
		Lead	0.11	I	ug/L	P355896	
		Nickel	0.40	I	ug/L	P355896	
		Silver	0.010	U	ug/L	P355896	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples 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: P355757

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355896

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355896

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Component	Result	Code	Units
Copper	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355991

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355992

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355907

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356223

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356223

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355842

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355900

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355763

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

Reference Method: SM 2120 B
Batch ID: P355783

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355947

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

Reference Method: SM 2540 C-97
Batch ID: P356302

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356080

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355950

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: P355956

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: P355896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	102		P	85 - 115
Sodium	89.4		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	106		P	85 - 115
Chromium	105		P	85 - 115
Lead	107		P	85 - 115
Nickel	102		P	85 - 115
Silver	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355991

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355992

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355907

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: P356223

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355842

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: P355842

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: P355900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355763

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

Reference Method: SM 2120 B
Batch ID: P355783

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	105		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P355947

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P355950

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046820	Iron	100		P	80 - 120
2046820	Magnesium	97.9		P	80 - 120
2046820	Potassium	99.8		P	80 - 120
2046820	Sodium	97.3		P	80 - 120
2046820	Zinc	103		P	80 - 120
2047120	Calcium	98.5		P	80 - 120
2047120	Iron	100	96.0	P/P	80 - 120
2047120	Magnesium	95.5		P	80 - 120
2047120	Potassium	106	108	P/P	80 - 120
2047120	Sodium	93.1	91.9	P/P	80 - 120
2047120	Zinc	97.6	98.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046820	Arsenic	104		P	80 - 120
2046820	Cadmium	104		P	80 - 120
2046820	Chromium	101		P	80 - 120
2046820	Lead	104		P	80 - 120
2046820	Nickel	98.1		P	80 - 120
2046820	Silver	103		P	80 - 120
2047120	Arsenic	108	107	P/P	80 - 120
2047120	Cadmium	107	108	P/P	80 - 120
2047120	Chromium	104	105	P/P	80 - 120
2047120	Lead	109	109	P/P	80 - 120
2047120	Nickel	101	100	P/P	80 - 120
2047120	Silver	107	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2044663	Copper	107		P	80 - 120
2047182	Copper	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046913	Chloride	97.7		P	90 - 110
2047113	Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355992

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047113	Sulfate	99.2		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355907

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046838	Ammonia-N	97.4	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356223

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046870	Kjeldahl Nitrogen	107	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355842

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046869	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046914	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046841	O-Phosphate-P	95.4	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047124	Fluoride	102	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046837	Organic Carbon	103	99.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047078	Turbidity	1.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047120	Calcium	1.02	Spike	P	0 - 20
2047120	Iron	3.68	Spike	P	0 - 20
2047120	Magnesium	5.75	Spike	P	0 - 20
2047120	Potassium	2.06	Spike	P	0 - 20
2047120	Sodium	0.684	Spike	P	0 - 20
2047120	Zinc	1.03	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047120	Arsenic	0.623	Spike	P	0 - 20
2047120	Cadmium	0.642	Spike	P	0 - 20
2047120	Chromium	0.150	Spike	P	0 - 20
2047120	Lead	0.0487	Spike	P	0 - 20
2047120	Nickel	0.290	Spike	P	0 - 20
2047120	Silver	0.728	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047182	Copper	0.228	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046913	Chloride	1.97	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355992

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046913	Sulfate	2.92	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355907

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046838	Ammonia-N	1.54	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356223

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046870	Kjeldahl Nitrogen	0.394	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046869	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046914	Total-P	0.589	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046841	O-Phosphate-P	1.61	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046862	Color (true)	1.03	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047124	Total Alkalinity	0.0475	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046863	TDS	3.40	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P355950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047124	Fluoride	0.979	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P355956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046837	Organic Carbon	2.14	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: A88214

Included Lab Sample IDs: 2046913

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88215

Included Lab Sample IDs: 2046915

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	97.8	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A88219

Included Lab Sample IDs: 2046913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	106	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88232

Included Lab Sample IDs: 2046914

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88258

Included Lab Sample IDs: 2046914

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	98.9	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88275

Included Lab Sample IDs: 2046913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88275

Included Lab Sample IDs: 2046913

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88276

Included Lab Sample IDs: 2046913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	102	P/P	90 - 110
Sulfate	99.8	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A88280
Included Lab Sample IDs: 2046914

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	99.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88289
Included Lab Sample IDs: 2046918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.4	97.1	P/P	90 - 110
Iron	95.0	93.6	P/P	90 - 110
Magnesium	95.9	94.4	P/P	90 - 110
Potassium	99.6	98.1	P/P	90 - 110
Sodium	94.4	94.4	P/P	90 - 110
Zinc	100	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88308
Included Lab Sample IDs: 2046914

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88319
Included Lab Sample IDs: 2046918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	103	P/P	90 - 110
Cadmium	101	103	P/P	90 - 110
Chromium	102	104	P/P	90 - 110
Lead	105	106	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Silver	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88403
Included Lab Sample IDs: 2046914

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88578
Included Lab Sample IDs: 2046918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	104	107	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 SMP	MS
						LCS	
EPA 180.1 Rev. 2.0	Turbidity					1.82	
EPA 200.7 Rev. 4.4	Calcium	103	98.5				1.02
	Iron	105	100	100	96.0		3.68
	Magnesium	101	97.9	95.5			5.75
	Potassium	102	99.8	106	108		2.06
	Sodium	89.4	97.3	93.1	91.9		0.684
	Zinc	101	103	97.6	98.6		1.03
EPA 200.8 Rev. 5.4	Arsenic	105	104	108	107		0.623
	Cadmium	106	104	107	108		0.642
	Chromium	105	101	104	105		0.150
	Copper	107	107	102	102		0.228
	Lead	107	104	109	109		0.0487
	Nickel	102	98.1	101	100		0.290
	Silver	106	103	107	108		0.728
EPA 300.0 Rev. 2.1	Chloride	99.6	97.7	99.6		1.97	
	Sulfate	99.5	99.2			2.92	
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	97.4	99.3			1.54
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	107	107			0.394
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	101	102			0.494
EPA 365.1 Rev. 2.0	Total-P	95.6	102	103			0.589
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	95.4	97.1			1.61
SM 2120 B	Color (true)	105				1.03	
SM 2320 B-97	Total Alkalinity	101				0.0475	
SM 2540 C-97	TDS					3.40	
SM 4500 F-C-97	Fluoride	99.4	102	101			0.979
SM 5310 B-00	Organic Carbon	99.6	103	99.7			2.14

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2046913
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2046918
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2046918
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2046913
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2046913
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2046914
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2046914
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2046914
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2046914
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2046915
SM 2120 B / E31780	True Color measured at 450 nm	2046913
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2046913
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2046913
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2046913
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2046913

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2046914

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	12/06/2018			12/06/2018 16:50	Megan Treadwell	2046913
EPA 200.7 Rev. 4.4	12/06/2018	12/10/2018 17:55	Elliott D. Healy	12/11/2018 21:31	Martin Acosta	2046918
EPA 200.8 Rev. 5.4	12/06/2018	12/10/2018 17:55	Elliott D. Healy	12/12/2018 11:16	Allison Taylor	2046918
	12/06/2018	12/27/2018 16:45	Elliott D. Healy	12/29/2018 01:49	Allison Taylor	2046918
EPA 300.0 Rev. 2.1	12/06/2018			12/11/2018 16:13	Lipi Saha	2046913
EPA 350.1 Rev. 2.0	12/06/2018			12/07/2018 14:26	Ping Hua	2046914
EPA 351.2 Rev. 2.0	12/06/2018	12/14/2018 12:30	Adrian Shelby	12/17/2018 15:32	Chelsea Hernandez	2046914
EPA 353.2 Rev. 2.0	12/06/2018			12/07/2018 14:17	Lauren Bottorf	2046914
EPA 365.1 Rev. 2.0	12/06/2018	12/11/2018 11:15	Sima Feizi	12/12/2018 11:11	Beverly Y. Sanders	2046914
EPA 365.1 Rev. 2.0 dissolved	12/06/2018			12/06/2018 15:23	Jhamieka S. Greenwood	2046915
SM 2120 B	12/06/2018			12/06/2018 15:44	Chelsea Hernandez	2046913
SM 2320 B-97	12/06/2018			12/11/2018 06:12	Lauren Bottorf	2046913
SM 2540 C-97	12/06/2018			12/11/2018 16:05	Yijie Li	2046913
SM 2540 D-97	12/06/2018			12/11/2018 16:05	Yijie Li	2046913
SM 4500 F-C-97	12/06/2018			12/11/2018 06:12	Lauren Bottorf	2046913
SM 5310 B-00	12/06/2018			12/10/2018 07:44	Megan Treadwell	2046914