Chemical Analysis Report

TLH-ROC-2019-01-28-02

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

Event Description: **Run 3**
Request ID: **RQ-2018-12-31-30**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 12-FEB-2019 11:23

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value and/or the analysis did not meet established quality control criteria.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Gulf of Mexico (Econfina River) **Collection Date/Time: 01/28/2019 13:13**

Field ID: G1TLHR0043 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2057435	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P357994	
	EPA 300.0	Bromide	0.53		mg Br/L	P358168	
	SM 2320 B-97	Total Alkalinity	53		mg CaCO3/L	P358270	
	SM 2540 D-97	TSS	2	I	mg/L	P358335	
	SM 4500 F-C-97	Fluoride	0.076	I	mg F/L	P358273	
2057436	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P358188	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P358081	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P358302	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P358096	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P358091	
2057437	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P358007	

Ref. Method and Comment:
EPA 300.0: Bromide: 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.

Sample Location: AUCILLA RIVER @ MOUTH **Collection Date/Time: 01/28/2019 14:14**

Field ID: G1TLHR0091 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2057432	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P357994	
	EPA 300.0	Bromide	0.61		mg Br/L	P358168	
	SM 2320 B-97	Total Alkalinity	61		mg CaCO3/L	P358270	
	SM 2540 D-97	TSS	2	U	mg/L	P358335	
	SM 4500 F-C-97	Fluoride	0.082	I	mg F/L	P358273	
2057433	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P358187	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P358081	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.027		mg N/L	P358302	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P358058	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P358091	
2057434	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P358007	
2057443	EPA 200.7 Rev. 4.4	Iron	420		ug/L	P357985	
		Manganese	15.4		ug/L	P357985	
		Zinc	5.0	U	ug/L	P357985	
	EPA 200.8 Rev. 5.4	Aluminum	187		ug/L	P357985	
		Antimony	0.050	U	ug/L	P357985	
		Arsenic	0.32		ug/L	P357985	
		Cadmium	0.020	U	ug/L	P357985	
		Chromium	0.54	I	ug/L	P357985	
		Copper	0.40	U	ug/L	P357985	
		Lead	0.20	U	ug/L	P357985	
		Nickel	0.50	U	ug/L	P357985	
		Selenium	0.20	U	ug/L	P357985	
		Silver	0.010	U	ug/L	P357985	
		Thallium	0.10	U	ug/L	P357985	

Ref. Method and Comment:
EPA 300.0: Bromide: 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 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: P357994

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357985

Component	Result	Code	Units
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357985

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.11	I	ug/L
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0
Batch ID: P358168

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358187

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358188

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P358081

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P358302

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358058

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358096

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358007

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

Reference Method: SM 2320 B-97
Batch ID: P358270

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

Reference Method: SM 2540 D-97
Batch ID: P358335

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P358273

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P358091

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: P357985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115
Manganese	104		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	98.8		P	85 - 115
Arsenic	105		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	97.7		P	85 - 115
Copper	101		P	85 - 115
Lead	97.6		P	85 - 115
Nickel	101		P	85 - 115
Selenium	102		P	85 - 115
Silver	104		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P358168

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358187

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358188

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P358081

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P358302

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358058

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358096

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358007

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

Reference Method: SM 2320 B-97
Batch ID: P358270

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P358273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P358091

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057021	Iron	102	98.7	P/P	80 - 120
2057021	Manganese	98.9	99.1	P/P	80 - 120
2057021	Zinc	97.9	98.1	P/P	80 - 120
2057241	Iron	101		P	80 - 120
2057241	Manganese	97.0		P	80 - 120
2057241	Zinc	96.7		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057021	Aluminum	98.0	98.7	P/P	80 - 120
2057021	Antimony	99.7	100	P/P	80 - 120
2057021	Arsenic	105	107	P/P	80 - 120
2057021	Cadmium	100	101	P/P	80 - 120
2057021	Chromium	99.1	100	P/P	80 - 120
2057021	Copper	99.7	99.6	P/P	80 - 120
2057021	Lead	98.6	100	P/P	80 - 120
2057021	Nickel	100	100	P/P	80 - 120
2057021	Selenium	101	103	P/P	80 - 120
2057021	Silver	105	105	P/P	80 - 120
2057021	Thallium	105	107	P/P	80 - 120
2057241	Aluminum	100		P	80 - 120
2057241	Antimony	98.9		P	80 - 120
2057241	Arsenic	106		P	80 - 120
2057241	Cadmium	103		P	80 - 120
2057241	Chromium	99.8		P	80 - 120
2057241	Copper	102		P	80 - 120
2057241	Lead	101		P	80 - 120
2057241	Nickel	101		P	80 - 120
2057241	Selenium	99.6		P	80 - 120
2057241	Silver	104		P	80 - 120
2057241	Thallium	108		P	80 - 120

Reference Method: EPA 300.0
Batch ID: P358168

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058121	Bromide	92.8	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057080	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057484	Ammonia-N	100	99.2	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P358081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057292	Kjeldahl Nitrogen	105	112	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P358302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057436	NO2NO3-N	95.3	95.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057456	Total-P	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358007

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057477	O-Phosphate-P	99.5	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P358273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057453	Fluoride	96.8	97.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P358091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2057151	Organic Carbon	104	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P357994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057446	Turbidity	16.6	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057021	Iron	2.33	Spike	P	0 - 20
2057021	Manganese	0.195	Spike	P	0 - 20
2057021	Zinc	0.227	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057021	Aluminum	0.796	Spike	P	0 - 20
2057021	Antimony	0.249	Spike	P	0 - 20
2057021	Arsenic	1.12	Spike	P	0 - 20
2057021	Cadmium	1.22	Spike	P	0 - 20
2057021	Chromium	1.13	Spike	P	0 - 20
2057021	Copper	0.174	Spike	P	0 - 20
2057021	Lead	1.34	Spike	P	0 - 20
2057021	Nickel	0.214	Spike	P	0 - 20
2057021	Selenium	2.51	Spike	P	0 - 20
2057021	Silver	0.0153	Spike	P	0 - 20
2057021	Thallium	1.79	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P358168

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2058121	Bromide	2.27	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057080	Ammonia-N	0.355	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P358188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057484	Ammonia-N	0.740	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P358081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057292	Kjeldahl Nitrogen	3.69	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P358302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057436	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057394	Total-P	1.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P358096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057456	Total-P	2.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057477	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P358270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057453	Total Alkalinity	0.248	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P358273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057453	Fluoride	0.476	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P358091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2057151	Organic Carbon	0.901	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: A89074
Included Lab Sample IDs: 2057432, 2057435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A89077
Included Lab Sample IDs: 2057434, 2057437

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	99.1	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A89080
Included Lab Sample IDs: 2057432, 2057435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	90.8	96.4	P/P	90 - 110
Bromide	96.4	93.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A89104
Included Lab Sample IDs: 2057443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	99.1	P/P	90 - 110
Manganese	102	100	P/P	90 - 110
Zinc	102	99.6	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A89107
Included Lab Sample IDs: 2057433, 2057436

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A89123
Included Lab Sample IDs: 2057433, 2057436

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A89125
Included Lab Sample IDs: 2057433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A89140
Included Lab Sample IDs: 2057433, 2057436

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A89161
Included Lab Sample IDs: 2057436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A89166
Included Lab Sample IDs: 2057432, 2057435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A89166
Included Lab Sample IDs: 2057432, 2057435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A89167
Included Lab Sample IDs: 2057433, 2057436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A89206
Included Lab Sample IDs: 2057443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	100	P/P	90 - 110
Antimony	97.7	97.0	P/P	90 - 110
Arsenic	102	103	P/P	90 - 110
Cadmium	98.8	98.5	P/P	90 - 110
Chromium	100	99.8	P/P	90 - 110
Copper	102	103	P/P	90 - 110
Lead	101	100	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Selenium	99.7	99.7	P/P	90 - 110
Silver	102	103	P/P	90 - 110
Thallium	96.2	96.9	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						16.6	
EPA 200.7 Rev. 4.4	Iron	105	102	98.7	101			2.33
	Manganese	104	98.9	99.1	97.0			0.195
	Zinc	103	97.9	98.1	96.7			0.227
EPA 200.8 Rev. 5.4	Aluminum	100	98.0	98.7	100			0.796
	Antimony	98.8	99.7	100	98.9			0.249
	Arsenic	105	105	107	106			1.12
	Cadmium	99.0	100	101	103			1.22
	Chromium	97.7	99.1	100	99.8			1.13
	Copper	101	99.7	99.6	102			0.174
	Lead	97.6	98.6	100	101			1.34
	Nickel	101	100	100	101			0.214
	Selenium	102	101	103	99.6			2.51
	Silver	104	105	105	104			0.0153
	Thallium	102	105	107	108			1.79
EPA 300.0	Bromide	99.5	92.8	96.2				2.27
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	100	100				0.355
	Ammonia-N	97.4	100	99.2				0.740
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	105	112				3.69
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	95.3	95.3				0.0
EPA 365.1 Rev. 2.0	Total-P	105						1.79
	Total-P	104	103	100				2.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	99.5	101				1.10
SM 2320 B-97	Total Alkalinity	102					0.248	
SM 4500 F-C-97	Fluoride	96.2	96.8	97.4				0.476
SM 5310 B-00	Organic Carbon	100	104	102				0.901

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2057432, 2057435
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2057443
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2057443
EPA 300.0 / E31780	Bromide in aqueous matrices	2057432, 2057435
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2057433, 2057436
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2057433, 2057436
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2057433, 2057436
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2057433, 2057436
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2057434, 2057437
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2057432, 2057435
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2057432, 2057435
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2057432, 2057435
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2057433, 2057436

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	01/28/2019			01/29/2019 16:31	Megan Treadwell	2057432, 2057435
EPA 200.7 Rev. 4.4	01/28/2019	01/29/2019 15:05	Elliott D. Healy	01/30/2019 18:25	Betina Topolski	2057443
EPA 200.8 Rev. 5.4	01/28/2019	01/29/2019 15:05	Elliott D. Healy	02/05/2019 19:15	Robert K Palmer	2057443
EPA 300.0	01/28/2019			01/31/2019 15:25	Lipi Saha	2057432
	01/28/2019			01/31/2019 19:24	Lipi Saha	2057435
EPA 350.1 Rev. 2.0	01/28/2019			01/31/2019 12:18	Ping Hua	2057433
	01/28/2019			01/31/2019 12:34	Ping Hua	2057436
EPA 351.2 Rev. 2.0	01/28/2019	01/30/2019 12:30	Adrian Shelby	02/01/2019 10:06	Joseph Suarez	2057433
	01/28/2019	01/30/2019 12:30	Adrian Shelby	02/01/2019 10:07	Joseph Suarez	2057436
EPA 353.2 Rev. 2.0	01/28/2019			02/04/2019 10:27	Beverly Y. Sanders	2057436
	01/28/2019			02/04/2019 10:38	Beverly Y. Sanders	2057433
EPA 365.1 Rev. 2.0	01/28/2019	01/30/2019 13:50	Sima Feizi	01/31/2019 14:59	Rosalyn Ballman	2057433
	01/28/2019	01/31/2019 14:30	Sima Feizi	02/01/2019 14:27	Rosalyn Ballman	2057436
EPA 365.1 Rev. 2.0 dissolved	01/28/2019			01/29/2019 15:46	Jhamieka S. Greenwood	2057434
	01/28/2019			01/29/2019 15:47	Jhamieka S. Greenwood	2057437
SM 2320 B-97	01/28/2019			02/03/2019 17:30	Dale L. Simmons	2057432
	01/28/2019			02/03/2019 17:43	Dale L. Simmons	2057435
SM 2540 D-97	01/28/2019			01/31/2019 14:21	Yijie Li	2057432, 2057435
SM 4500 F-C-97	01/28/2019			02/03/2019 17:30	Dale L. Simmons	2057432
	01/28/2019			02/03/2019 17:43	Dale L. Simmons	2057435
SM 5310 B-00	01/28/2019			01/30/2019 19:57	Chelsea Hernandez	2057433
	01/28/2019			01/30/2019 20:09	Chelsea Hernandez	2057436