Chemical Analysis Report

NE-DIST-2017-06-14-02

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

Event Description: **LSJR SWest-2**
Request ID: **RQ-2017-06-12-16**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256-7577
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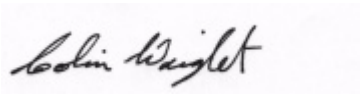
Certified by: Colin Wright, Program Administrator

Date Certified: 10-JUL-2017 14:40



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.JOHNS RIVER @ ALPINE GROVE DOCK **Collection Date/Time: 06/13/2017 09:50**

Field ID: G2NE1129 06132017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1906054	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P326838	
	EPA 300.0 Rev. 2.1	Chloride	3.8E+03		mg Cl/L	P327213	
		Sulfate	560		mg SO4/L	P327215	
	SM 2120 B	Color (true)	50		PCU	P326854	
	SM 2320 B-97	Total Alkalinity	72	A	mg CaCO3/L	P327363	
	SM 2540 C-97	TDS	6.82E+03		mg/L	P327133	
	SM 2540 D-97	TSS	3	I	mg/L	P327462	
	SM 4500 F-C-97	Fluoride	0.33		mg F/L	P327368	
1906055	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P326975	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P326920	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P327106	
	EPA 365.1 Rev. 2.0	Total-P	0.090		mg P/L	P326925	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P327417	
1906056	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.056		mg P/L	P326828	
1906073	EPA 200.7 Rev. 4.4	Calcium	104		mg/L	P327055	
		Iron	95	I	ug/L	P327055	
		Magnesium	230		mg/L	P327055	
		Potassium	66		mg/L	P327055	
		Sodium	1.84E+03		mg/L	P327055	
	EPA 200.8 Rev. 5.4	Arsenic	1.2	I	ug/L	P327055	
		Cadmium	0.15	U	ug/L	P327055	
		Chromium	0.90	U	ug/L	P327055	
		Copper	1.5	U	ug/L	P327055	
		Lead	0.60	U	ug/L	P327055	
		Nickel	0.75	U	ug/L	P327055	
		Silver	0.075	U	ug/L	P327055	
		Zinc	15	U	ug/L	P327055	

Ref. Method and Comment:
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, magnesium, potassium, and sodium 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: P326838

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327055

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: P327055

Component	Result	Code	Units
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327055

Component	Result	Code	Units
Arsenic	0.25	U	ug/L
Cadmium	0.050	U	ug/L
Chromium	0.30	U	ug/L
Copper	0.50	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.25	U	ug/L
Silver	0.025	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326920

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327106

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326925

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: P326828

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

Reference Method: SM 2120 B
Batch ID: P326854

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P327363

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

Reference Method: SM 2540 C-97
Batch ID: P327133

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P327462

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P327368

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P327417

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: P327055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	98.4		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	100		P	85 - 115
Sodium	100		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	109		P	85 - 115
Chromium	106		P	85 - 115
Copper	105		P	85 - 115
Lead	104		P	85 - 115
Nickel	106		P	85 - 115
Silver	102		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

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: P326975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326920

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: P327106

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: P326925

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: P326828

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P327363

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P327368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P327417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906073	Iron	97.9	98.1	P/P	70 - 130
1906635	Iron	91.4		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906073	Arsenic	98.8	102	P/P	70 - 130
1906073	Cadmium	91.9	96.8	P/P	70 - 130
1906073	Chromium	98.5	98.2	P/P	70 - 130
1906073	Copper	98.7	104	P/P	70 - 130
1906073	Lead	100	105	P/P	70 - 130
1906073	Nickel	99.5	100	P/P	70 - 130
1906073	Silver	94.0	99.6	P/P	70 - 130
1906073	Zinc	89.0	97.2	P/P	70 - 130
1906635	Arsenic	97.5		P	70 - 130
1906635	Cadmium	100		P	70 - 130
1906635	Chromium	101		P	70 - 130
1906635	Copper	91.5		P	70 - 130
1906635	Lead	105		P	70 - 130
1906635	Nickel	93.3		P	70 - 130
1906635	Silver	95.9		P	70 - 130
1906635	Zinc	86.4		P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906143	Chloride	99.2		P	90 - 110
1906231	Chloride	104		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906143	Sulfate	95.6		P	90 - 110
1906231	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326975

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906115	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906159	Kjeldahl Nitrogen	97.2	96.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905945	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906115	Total-P	98.2	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906170	O-Phosphate-P	94.2	93.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P327368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906054	Fluoride	97.6	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P327417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906144	Organic Carbon	93.7	95.5	P/P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906015	Turbidity	2.93	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906073	Calcium	0.597	Spike	P	0 - 20
1906073	Iron	0.270	Spike	P	0 - 20
1906073	Magnesium	0.755	Spike	P	0 - 20
1906073	Potassium	0.380	Spike	P	0 - 20
1906073	Sodium	0.859	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906073	Arsenic	2.79	Spike	P	0 - 20
1906073	Cadmium	5.18	Spike	P	0 - 20
1906073	Chromium	0.353	Spike	P	0 - 20
1906073	Copper	4.85	Spike	P	0 - 20
1906073	Lead	4.62	Spike	P	0 - 20
1906073	Nickel	0.519	Spike	P	0 - 20
1906073	Silver	5.72	Spike	P	0 - 20
1906073	Zinc	8.72	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906143	Chloride	0.157	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906143	Sulfate	0.556	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906115	Ammonia-N	0.552	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906159	Kjeldahl Nitrogen	0.606	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905945	NO2NO3-N	0.470	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906115	Total-P	3.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906170	O-Phosphate-P	0.712	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P326854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906040	Color (true)	2.38	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P327363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906054	Total Alkalinity	0.558	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P327133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906014	TDS	3.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P327368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906054	Fluoride	0.979	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P327417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906144	Organic Carbon	1.38	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 365.1 Rev. 2.0 dissolved
Run ID: A77087
Included Lab Sample IDs: 1906056

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77089
Included Lab Sample IDs: 1906054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A77095
Included Lab Sample IDs: 1906054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	98.2	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77139
Included Lab Sample IDs: 1906055

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77169
Included Lab Sample IDs: 1906055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77173
Included Lab Sample IDs: 1906055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77183
Included Lab Sample IDs: 1906054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	102	P/P	90 - 110
Sulfate	99.3	109	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77192
Included Lab Sample IDs: 1906055

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77217
Included Lab Sample IDs: 1906073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.8	97.5	P/P	95 - 105
Iron	99.7	97.8	P/P	95 - 105
Magnesium	101	99.2	P/P	95 - 105
Potassium	100	100	P/P	95 - 105
Sodium	99.2	98.0	P/P	95 - 105

Reference Method: SM 2320 B-97
Run ID: A77288
Included Lab Sample IDs: 1906054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77288
Included Lab Sample IDs: 1906054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.3	95.1	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A77311
Included Lab Sample IDs: 1906055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.6	94.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77444
Included Lab Sample IDs: 1906073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.6	97.4	P/P	90 - 110
Cadmium	99.7	100	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Copper	99.8	98.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77444
Included Lab Sample IDs: 1906073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	102	101	P/P	90 - 110
Nickel	102	99.6	P/P	90 - 110
Silver	98.9	98.4	P/P	90 - 110
Zinc	99.4	97.6	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						2.93	
EPA 200.7 Rev. 4.4	Calcium	101						0.597
	Iron	98.4	97.9	98.1	91.4			0.270
	Magnesium	101						0.755
	Potassium	100						0.380
	Sodium	100						0.859
EPA 200.8 Rev. 5.4	Arsenic	102	98.8	102	97.5			2.79
	Cadmium	109	91.9	96.8	100			5.18
	Chromium	106	98.5	98.2	101			0.353
	Copper	105	98.7	104	91.5			4.85
	Lead	104	100	105	105			4.62
	Nickel	106	99.5	100	93.3			0.519
	Silver	102	94.0	99.6	95.9			5.72
	Zinc	103	89.0	97.2	86.4			8.72
EPA 300.0 Rev. 2.1	Chloride	101	99.2	104			0.157	
	Sulfate	99.5	95.6	103			0.556	
EPA 350.1 Rev. 2.0	Ammonia-N	101	101	102				0.552
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	97.2	96.2				0.606
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	101				0.470
EPA 365.1 Rev. 2.0	Total-P	101	98.2	94.5				3.41
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1	94.2	93.5				0.712
SM 2120 B	Color (true)						2.38	
SM 2320 B-97	Total Alkalinity	103					0.558	
SM 2540 C-97	TDS						3.76	
SM 4500 F-C-97	Fluoride	94.6	97.6	98.9				0.979
SM 5310 B-00	Organic Carbon	94.2	93.7	95.5				1.38

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1906054
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1906073
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1906073

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1906054
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1906054
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1906055
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1906055
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1906055
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1906055
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1906056
SM 2120 B / E31780	True Color measured at 450 nm	1906054
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1906054
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1906054
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1906054
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1906054
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1906055

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	06/14/2017			06/14/2017 16:01	Sima Feizi	1906054
EPA 200.7 Rev. 4.4	06/14/2017	06/19/2017	Elliott D. Healy	06/20/2017	Betina Topolski	1906073
EPA 200.8 Rev. 5.4	06/14/2017	06/19/2017	Elliott D. Healy	06/29/2017	Robert K Palmer	1906073
EPA 300.0 Rev. 2.1	06/14/2017			06/20/2017	Julia Storbeck	1906054
EPA 350.1 Rev. 2.0	06/14/2017			06/15/2017	Sofia Elnemr	1906055
EPA 351.2 Rev. 2.0	06/14/2017	06/15/2017	Adrian Shelby	06/20/2017	Joseph Suarez	1906055
EPA 353.2 Rev. 2.0	06/14/2017			06/19/2017	Beverly Y. Sanders	1906055
EPA 365.1 Rev. 2.0	06/14/2017	06/15/2017	Adrian Shelby	06/16/2017	Lipi Saha	1906055
EPA 365.1 Rev. 2.0 dissolved	06/14/2017			06/14/2017 14:20	Lipi Saha	1906056
SM 2120 B	06/14/2017			06/14/2017 16:52	Tanya Welborn	1906054
SM 2320 B-97	06/14/2017			06/22/2017	Dale L. Simmons	1906054
SM 2540 C-97	06/14/2017			06/16/2017	Yijie Li	1906054
SM 2540 D-97	06/14/2017			06/16/2017	Yijie Li	1906054
SM 4500 F-C-97	06/14/2017			06/22/2017	Dale L. Simmons	1906054
SM 5310 B-00	06/14/2017			06/23/2017	Ping Hua	1906055