Chemical Analysis Report

SE-DIST-2016-09-15-01

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

Event Description: **SMP-Goob Run**
Request ID: **RQ-2016-06-13-34**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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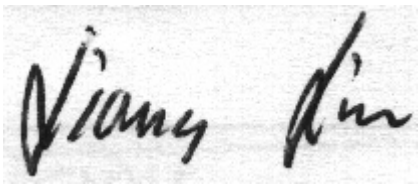
Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-OCT-2016 10:22



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: Taylor Creek 0.5 mi S city STP EFF **Collection Date/Time: 09/14/2016 12:35**

Field ID: G1SE0010 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1831757	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P311234	
	EPA 300.0 Rev. 2.1	Chloride	37		mg Cl/L	P311707	
		Sulfate	25		mg SO4/L	P311705	
	SM 2120 B	Color (true)	250		PCU	P311247	
	SM 2320 B-97	Total Alkalinity	126		mg CaCO3/L	P311385	
	SM 2540 C-97	TDS	294		mg/L	P312206	
	SM 2540 D-97	TSS	6	I	mg/L	P311877	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P311389	
1831758	EPA 350.1 Rev. 2.0	Ammonia-N	0.53		mg N/L	P311423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.3		mg N/L	P311835	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P311669	
	EPA 365.1 Rev. 2.0	Total-P	0.39		mg P/L	P311902	
	SM 5310 B-00	Organic Carbon	32		mg C/L	P311529	
1831759	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.27		mg P/L	P311240	
1831761	EPA 200.7 Rev. 4.4	Calcium	59.9		mg/L	P311606	
		Iron	1.44E+03		ug/L	P311606	
		Magnesium	5.22		mg/L	P311606	
		Potassium	3.4		mg/L	P311606	
		Sodium	26.3		mg/L	P311606	
		Zinc	5.0	U	ug/L	P311606	
	EPA 200.8 Rev. 5.4	Arsenic	2.32		ug/L	P311606	
		Cadmium	0.020	U	ug/L	P311606	
		Chromium	0.92		ug/L	P311606	
		Copper	0.72		ug/L	P311606	
		Lead	0.30		ug/L	P311606	
		Nickel	0.96		ug/L	P311606	
		Silver	0.0050	U	ug/L	P311606	

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 potassium 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: P311234

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311606

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: P311606

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: P311606

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311705

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311707

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311423

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311835

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311669

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311902

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: P311240

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

Reference Method: SM 2120 B
Batch ID: P311247

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311385

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

Reference Method: SM 2540 C-97
Batch ID: P312206

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311877

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P311389

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311529

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: P311606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	106		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	103		P	85 - 115
Zinc	102		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.9		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.5		P	85 - 115
Copper	97.6		P	85 - 115
Lead	95.7		P	85 - 115
Nickel	99.5		P	85 - 115
Silver	96.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311423

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311835

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311902

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: P311240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	103		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P311385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P311389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P311529

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832786	Calcium	107		P	80 - 120
1832786	Iron	103	108	P/P	80 - 120
1832786	Magnesium	103		P	80 - 120
1832786	Sodium	104		P	80 - 120
1832786	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832786	Arsenic	105	106	P/P	80 - 120
1832786	Cadmium	103	104	P/P	80 - 120
1832786	Chromium	96.6	98.4	P/P	80 - 120
1832786	Copper	95.1	96.8	P/P	80 - 120
1832786	Lead	96.9	98.0	P/P	80 - 120
1832786	Nickel	97.7	98.2	P/P	80 - 120
1832786	Silver	96.5	97.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831628	Sulfate	98.2		P	90 - 110
1831814	Sulfate	95.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831628	Chloride	102		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831814	Chloride	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311423

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831783	Ammonia-N	99.4	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831754	Kjeldahl Nitrogen	91.3	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831725	NO2NO3-N	96.8	97.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831754	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831821	O-Phosphate-P	99.2	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831378	Fluoride	102	102	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831753	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831714	Turbidity	1.04	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832786	Calcium	1.52	Spike	P	0 - 20
1832786	Iron	4.39	Spike	P	0 - 20
1832786	Magnesium	3.88	Spike	P	0 - 20
1832786	Potassium	2.77	Spike	P	0 - 20
1832786	Sodium	2.65	Spike	P	0 - 20
1832786	Zinc	1.21	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832786	Arsenic	1.00	Spike	P	0 - 20
1832786	Cadmium	0.932	Spike	P	0 - 20
1832786	Chromium	1.80	Spike	P	0 - 20
1832786	Copper	1.60	Spike	P	0 - 20
1832786	Lead	1.10	Spike	P	0 - 20
1832786	Nickel	0.432	Spike	P	0 - 20
1832786	Silver	0.734	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831628	Sulfate	0.209	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831628	Chloride	0.288	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831783	Ammonia-N	0.00546	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831754	Kjeldahl Nitrogen	6.25	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831725	NO2NO3-N	0.434	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831754	Total-P	0.387	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831821	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P311247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831695	Color (true)	2.62	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831378	Total Alkalinity	0.410	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P312206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831809	TDS	2.16	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831378	Fluoride	0.0	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P311529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831753	Organic Carbon	0.0	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: A71650
Included Lab Sample IDs: 1831757

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71652
Included Lab Sample IDs: 1831759

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.5	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71654
Included Lab Sample IDs: 1831757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.1	98.9	P/P	85 - 115

Reference Method: SM 2320 B-97
Run ID: A71696
Included Lab Sample IDs: 1831757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71696
Included Lab Sample IDs: 1831757

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71708
Included Lab Sample IDs: 1831758

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	95.9	96.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A71737
Included Lab Sample IDs: 1831758

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71777
Included Lab Sample IDs: 1831758

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71789
Included Lab Sample IDs: 1831757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.1	97.2	P/P	90 - 110
Sulfate	98.4	97.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71810
Included Lab Sample IDs: 1831761

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	106	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	103	105	P/P	90 - 110
Sodium	104	105	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71844
Included Lab Sample IDs: 1831761

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	99.7	P/P	90 - 110
Cadmium	98.7	98.8	P/P	90 - 110
Chromium	97.7	97.8	P/P	90 - 110
Copper	95.9	95.9	P/P	90 - 110
Lead	94.5	94.2	P/P	90 - 110
Nickel	98.0	98.4	P/P	90 - 110
Silver	95.8	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71890
Included Lab Sample IDs: 1831758

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71935
Included Lab Sample IDs: 1831758

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	105	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					1.04	
EPA 200.7 Rev. 4.4	Calcium	106	107				1.52
	Iron	106	103	108			4.39
	Magnesium	104	103				3.88
	Potassium	102					2.77
	Sodium	103	104				2.65
	Zinc	102	101	102			1.21
EPA 200.8 Rev. 5.4	Arsenic	99.9	105	106			1.00
	Cadmium	100	103	104			0.932
	Chromium	97.5	96.6	98.4			1.80
	Copper	97.6	95.1	96.8			1.60
	Lead	95.7	96.9	98.0			1.10
	Nickel	99.5	97.7	98.2			0.432
	Silver	96.3	96.5	97.2			0.734
EPA 300.0 Rev. 2.1	Chloride	98.7	102	99.2		0.288	
	Sulfate	94.9	98.2	95.6		0.209	
EPA 350.1 Rev. 2.0	Ammonia-N	98.3	99.4	99.4			0.0054
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	91.3	99.8			6.25
EPA 353.2 Rev. 2.0	NO2NO3-N	107	96.8	97.2			0.434
EPA 365.1 Rev. 2.0	Total-P	101	101	101			0.387
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	99.2	100			1.10
SM 2120 B	Color (true)					2.62	
SM 2320 B-97	Total Alkalinity	104				0.410	
SM 2540 C-97	TDS					2.16	
SM 4500 F-C-97	Fluoride	100	102	102			0.0
SM 5310 B-00	Organic Carbon	101	101	101			0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1831757
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1831761
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1831761
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1831757

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1831757
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1831758
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1831758
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1831758
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1831758
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1831759
SM 2120 B / E31780	True Color measured at 450 nm	1831757
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1831757
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1831757
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1831757
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1831757
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1831758

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	09/15/2016			09/15/2016 15:35	Sima Feizi	1831757
EPA 200.7 Rev. 4.4	09/15/2016	09/21/2016	Elliott D. Healy	09/23/2016	Joshua Ayres	1831761
EPA 200.8 Rev. 5.4	09/15/2016	09/21/2016	Elliott D. Healy	09/26/2016	Charles J. Peterson	1831761
EPA 300.0 Rev. 2.1	09/15/2016			09/23/2016	Ping Hua	1831757
EPA 350.1 Rev. 2.0	09/15/2016			09/16/2016	Sofia Elnemr	1831758
EPA 351.2 Rev. 2.0	09/15/2016	09/26/2016	Adrian Shelby	09/28/2016	Christopher Armour	1831758
EPA 353.2 Rev. 2.0	09/15/2016			09/22/2016	Peter D. Kaus	1831758
EPA 365.1 Rev. 2.0	09/15/2016	09/27/2016	Vijayalakshmi Reddy	09/28/2016	Lipi Saha	1831758
EPA 365.1 Rev. 2.0 dissolved	09/15/2016			09/15/2016 15:42	Julia Storbeck	1831759
SM 2120 B	09/15/2016			09/15/2016 19:19	Julie Michelle Frank	1831757
SM 2320 B-97	09/15/2016			09/17/2016	Dale L. Simmons	1831757
SM 2540 C-97	09/15/2016			09/20/2016	Sima Feizi	1831757
SM 2540 D-97	09/15/2016			09/20/2016	Sima Feizi	1831757
SM 4500 F-C-97	09/15/2016			09/17/2016	Dale L. Simmons	1831757
SM 5310 B-00	09/15/2016			09/20/2016	Sofia Elnemr	1831758