Chemical Analysis Report

SE-DIST-2017-04-13-01

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

Event Description: **SMP-G5 Everglades Run**
Request ID: **RQ-2017-04-10-52**
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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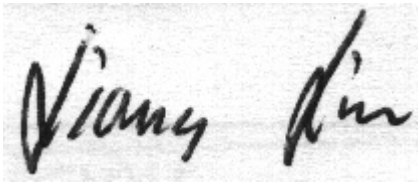
Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-MAY-2017 16:11



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: WCA1 South near S-39 **Collection Date/Time: 04/12/2017 11:00**

Field ID: G5SE0047 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888689	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P323527	
	EPA 300.0 Rev. 2.1	Chloride	85		mg Cl/L	P324107	
		Sulfate	22		mg SO4/L	P323864	
	SM 2120 B	Color (true)	56		PCU	P323337	
	SM 2320 B-97	Total Alkalinity	94		mg CaCO3/L	P323889	
	SM 2540 C-97	TDS	299		mg/L	P324100	
	SM 2540 D-97	TSS	2	U	mg/L	P323933	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P324403	
1888690	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P323348	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.15		mg N/L	P323555	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323700	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P323511	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P323470	
1888691	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323342	
1888695	EPA 200.7 Rev. 4.4	Calcium	30.7		mg/L	P323764	
		Iron	30	U	ug/L	P323764	
		Magnesium	10.9		mg/L	P323764	
		Potassium	4.0		mg/L	P323764	
		Sodium	57.0		mg/L	P323764	
		Zinc	5.0	U	ug/L	P323764	
	EPA 200.8 Rev. 5.4	Arsenic	0.65		ug/L	P323764	
		Cadmium	0.020	U	ug/L	P323764	
		Chromium	0.40	U	ug/L	P323764	
		Copper	0.20	U	ug/L	P323764	
		Lead	0.050	U	ug/L	P323764	
		Nickel	0.20	U	ug/L	P323764	
		Silver	0.010	U	ug/L	P323764	

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

Sample Location: WCA3 L-67 @ S-151 **Collection Date/Time: 04/12/2017 12:00**

Field ID: G5SE0041 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888683	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P323527	
	EPA 300.0 Rev. 2.1	Chloride	64		mg Cl/L	P324107	
		Sulfate	4.1		mg SO4/L	P323864	
	SM 2120 B	Color (true)	47	A	PCU	P323337	
	SM 2320 B-97	Total Alkalinity	223		mg CaCO3/L	P323889	
	SM 2540 C-97	TDS	360		mg/L	P324100	
	SM 2540 D-97	TSS	3	I	mg/L	P323933	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P324403	
1888685	EPA 350.1 Rev. 2.0	Ammonia-N	0.090		mg N/L	P323348	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.31		mg N/L	P323503	

Field ID: G5SE0041 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888685	EPA 353.2 Rev. 2.0	NO2NO3-N	0.053		mg N/L	P323700	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P323511	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P323470	
1888687	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323342	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: WCA2B @ S-143 Stage Station **Collection Date/Time: 04/12/2017 12:30**

Field ID: G5SE0040 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888684	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P323527	
	EPA 300.0 Rev. 2.1	Chloride	91		mg Cl/L	P324107	
		Sulfate	31		mg SO4/L	P323864	
	SM 2120 B	Color (true)	70		PCU	P323337	
	SM 2320 B-97	Total Alkalinity	208		mg CaCO3/L	P323889	
	SM 2540 C-97	TDS	452		mg/L	P324100	
	SM 2540 D-97	TSS	4	I	mg/L	P323933	
	SM 4500 F-C-97	Fluoride	0.40		mg F/L	P324403	
1888686	EPA 350.1 Rev. 2.0	Ammonia-N	0.068		mg N/L	P323348	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.51		mg N/L	P323503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.070		mg N/L	P323700	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P323511	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P323470	
1888688	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323342	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: 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: P323527

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323764

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323764

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323864

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324107

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323348

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323555

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323700

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323511

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: P323342

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

Reference Method: SM 2120 B
Batch ID: P323337

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P323889

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

Reference Method: SM 2540 C-97
Batch ID: P324100

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P323933

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P324403

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P323470

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: P323764

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	107		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	103		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: P323764

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.3		P	85 - 115
Cadmium	97.4		P	85 - 115
Chromium	95.8		P	85 - 115
Copper	90.2		P	85 - 115
Lead	93.5		P	85 - 115
Nickel	90.6		P	85 - 115
Silver	95.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323864

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324107

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323348

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323555

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323700

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323511

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323342

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

Reference Method: SM 2320 B-97
Batch ID: P323889

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P324403

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P323470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888524	Calcium	107		P	80 - 120
1888524	Iron	110		P	80 - 120
1888524	Magnesium	107		P	80 - 120
1888524	Potassium	104		P	80 - 120
1888524	Sodium	104		P	80 - 120
1888524	Zinc	105		P	80 - 120
1888996	Calcium	105	108	P/P	80 - 120
1888996	Iron	104	107	P/P	80 - 120
1888996	Magnesium	105	108	P/P	80 - 120
1888996	Potassium	105	106	P/P	80 - 120
1888996	Sodium	101	102	P/P	80 - 120
1888996	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888524	Arsenic	97.4		P	80 - 120
1888524	Cadmium	97.7		P	80 - 120
1888524	Chromium	95.2		P	80 - 120
1888524	Copper	90.1		P	80 - 120
1888524	Lead	94.5		P	80 - 120
1888524	Nickel	90.8		P	80 - 120
1888524	Silver	95.1		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888996	Arsenic	97.5	95.5	P/P	80 - 120
1888996	Cadmium	101	98.3	P/P	80 - 120
1888996	Chromium	99.4	99.1	P/P	80 - 120
1888996	Copper	100	101	P/P	80 - 120
1888996	Lead	96.4	95.6	P/P	80 - 120
1888996	Nickel	101	101	P/P	80 - 120
1888996	Silver	97.5	96.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888661	Sulfate	100		P	90 - 110
1888829	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888662	Chloride	102		P	90 - 110
1888828	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888663	Ammonia-N	98.5	96.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888706	Kjeldahl Nitrogen	90.3	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888663	NO2NO3-N	97.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323511

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888668	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888665	O-Phosphate-P	95.9	96.9	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P324403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888726	Fluoride	104	103	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P323470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888031	Organic Carbon	104	104	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888542	Turbidity	6.74	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888996	Calcium	1.90	Spike	P	0 - 20
1888996	Iron	2.43	Spike	P	0 - 20
1888996	Magnesium	2.31	Spike	P	0 - 20
1888996	Potassium	1.45	Spike	P	0 - 20
1888996	Sodium	0.704	Spike	P	0 - 20
1888996	Zinc	0.391	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888996	Arsenic	2.06	Spike	P	0 - 20
1888996	Cadmium	2.85	Spike	P	0 - 20
1888996	Chromium	0.278	Spike	P	0 - 20
1888996	Copper	0.620	Spike	P	0 - 20
1888996	Lead	0.918	Spike	P	0 - 20
1888996	Nickel	0.664	Spike	P	0 - 20
1888996	Silver	1.20	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888661	Sulfate	3.13	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888662	Chloride	0.262	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888663	Ammonia-N	1.51	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888686	Kjeldahl Nitrogen	2.33	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888706	Kjeldahl Nitrogen	5.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888663	NO2NO3-N	0.406	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323511

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888668	Total-P	1.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888665	O-Phosphate-P	0.943	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P323337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888683	Color (true)	2.31	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P323889

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888726	Total Alkalinity	0.299	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P324100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888667	TDS	0.546	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P324403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888726	Fluoride	0.558	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P323470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888031	Organic Carbon	0.462	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A75770
Included Lab Sample IDs: 1888683, 1888684, 1888689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	100	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75771
Included Lab Sample IDs: 1888687, 1888688, 1888691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.9	97.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75772
Included Lab Sample IDs: 1888685, 1888686, 1888690

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A75802
Included Lab Sample IDs: 1888685, 1888686, 1888690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75831
Included Lab Sample IDs: 1888683, 1888684, 1888689

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75853
Included Lab Sample IDs: 1888685, 1888686

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.0	P/P	90 - 110
Kjeldahl Nitrogen	94.6	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75872
Included Lab Sample IDs: 1888690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A75873
Included Lab Sample IDs: 1888685, 1888686, 1888690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A75875
Included Lab Sample IDs: 1888685, 1888686, 1888690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.5	94.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A75903
Included Lab Sample IDs: 1888683, 1888684, 1888689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	101	108	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A75952
Included Lab Sample IDs: 1888683, 1888684, 1888689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A75972
Included Lab Sample IDs: 1888695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	93.4	93.6	P/P	90 - 110
Cadmium	96.7	95.7	P/P	90 - 110
Chromium	96.0	97.1	P/P	90 - 110
Copper	90.9	90.9	P/P	90 - 110
Lead	94.6	94.9	P/P	90 - 110
Nickel	90.3	90.8	P/P	90 - 110
Silver	93.8	93.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A75999
Included Lab Sample IDs: 1888683, 1888684, 1888689

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76050
Included Lab Sample IDs: 1888695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	101	P/P	90 - 110
Iron	106	103	P/P	90 - 110
Magnesium	106	102	P/P	90 - 110
Potassium	104	98.7	P/P	90 - 110
Sodium	102	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A76126
Included Lab Sample IDs: 1888683, 1888684, 1888689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76307
Included Lab Sample IDs: 1888695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	102	101	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				6.74	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Calcium	108	107	105	108			1.90
	Iron	107	110	104	107			2.43
	Magnesium	108	107	105	108			2.31
	Potassium	103	104	105	106			1.45
	Sodium	103	104	101	102			0.704
	Zinc	102	105	101	102			0.391
EPA 200.8 Rev. 5.4	Arsenic	96.3	97.4	97.5	95.5			2.06
	Cadmium	97.4	97.7	101	98.3			2.85
	Chromium	95.8	95.2	99.4	99.1			0.278
	Copper	90.2	100	101	90.1			0.620
	Lead	93.5	94.5	96.4	95.6			0.918
	Nickel	90.6	101	101	90.8			0.664
	Silver	95.6	95.1	97.5	96.3			1.20
EPA 300.0 Rev. 2.1	Chloride	101	102	102			0.262	
	Sulfate	97.4	100	102			3.13	
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.5	96.2				1.51
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102						2.33
	Kjeldahl Nitrogen	104	90.3	98.3				5.62
EPA 353.2 Rev. 2.0	NO2NO3-N	96.0	97.5	97.0				0.406
EPA 365.1 Rev. 2.0	Total-P	104	102	104				1.48
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	95.9	96.9				0.943
SM 2120 B	Color (true)						2.31	
SM 2320 B-97	Total Alkalinity	105					0.299	
SM 2540 C-97	TDS						0.546	
SM 4500 F-C-97	Fluoride	94.7	104	103				0.558
SM 5310 B-00	Organic Carbon	105	104	104				0.462

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1888683, 1888684, 1888689
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1888695
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1888695
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1888683, 1888684, 1888689
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1888683, 1888684, 1888689
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1888685, 1888686, 1888690
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1888685, 1888686, 1888690
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1888685, 1888686, 1888690
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1888685, 1888686, 1888690
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1888687, 1888688, 1888691
SM 2120 B / E31780	True Color measured at 450 nm	1888683, 1888684, 1888689
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1888683, 1888684, 1888689
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1888683, 1888684, 1888689
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1888683, 1888684, 1888689
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1888683, 1888684, 1888689

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1888685, 1888686, 1888690

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	04/13/2017			04/13/2017 16:21	Sima Feizi	1888683, 1888684, 1888689
EPA 200.7 Rev. 4.4	04/13/2017	04/20/2017	Elliott D. Healy	04/27/2017	Martin Acosta	1888695
	04/13/2017	04/20/2017	Elliott D. Healy	05/09/2017	Martin Acosta	1888695
EPA 200.8 Rev. 5.4	04/13/2017	04/20/2017	Elliott D. Healy	04/25/2017	Betina Topolski	1888695
EPA 300.0 Rev. 2.1	04/13/2017			04/20/2017	Ping Hua	1888683, 1888684, 1888689
	04/13/2017			04/26/2017	Ping Hua	1888683, 1888684, 1888689
EPA 350.1 Rev. 2.0	04/13/2017			04/13/2017	Julie Michelle Frank	1888685, 1888686, 1888690
EPA 351.2 Rev. 2.0	04/13/2017	04/17/2017	Adrian Shelby	04/18/2017	Joseph Suarez	1888685, 1888686
	04/13/2017	04/18/2017	Adrian Shelby	04/19/2017	Joseph Suarez	1888690
EPA 353.2 Rev. 2.0	04/13/2017			04/19/2017	Beverly Y. Sanders	1888685, 1888686, 1888690
EPA 365.1 Rev. 2.0	04/13/2017	04/17/2017	Vijayalakshmi Reddy	04/19/2017	Lipi Saha	1888685, 1888686, 1888690
EPA 365.1 Rev. 2.0 dissolved	04/13/2017			04/13/2017 13:48	Anthony C. Onicha	1888687
	04/13/2017			04/13/2017 13:49	Anthony C. Onicha	1888688
	04/13/2017			04/13/2017 13:50	Anthony C. Onicha	1888691
SM 2120 B	04/13/2017			04/13/2017 15:03	Julia Storbeck	1888683
	04/13/2017			04/13/2017 15:05	Julia Storbeck	1888684
	04/13/2017			04/13/2017 15:06	Julia Storbeck	1888689
SM 2320 B-97	04/13/2017			04/22/2017	Dale L. Simmons	1888683, 1888684, 1888689
SM 2540 C-97	04/13/2017			04/17/2017	Sima Feizi	1888683, 1888684, 1888689
SM 2540 D-97	04/13/2017			04/17/2017	Sima Feizi	1888683, 1888684, 1888689
SM 4500 F-C-97	04/13/2017			05/01/2017	Dale L. Simmons	1888683, 1888684, 1888689
SM 5310 B-00	04/13/2017			04/14/2017	Julie Michelle Frank	1888685, 1888686, 1888690