Chemical Analysis Report

SE-DIST-2017-06-08-01

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-2017-05-08-15**
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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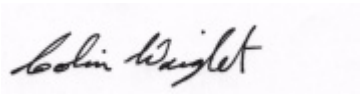
Certified by: Colin Wright, Program Administrator

Date Certified: 03-JUL-2017 12:37



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 NE of S6 (Boat Ramp) **Collection Date/Time: 06/07/2017 11:55**

Field ID: G5SE0018 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1904378	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P326477	
	EPA 300.0 Rev. 2.1	Chloride	97		mg Cl/L	P326949	
		Sulfate	45		mg SO4/L	P326953	
	SM 2120 B	Color (true)	80		PCU	P326474	
	SM 2320 B-97	Total Alkalinity	142		mg CaCO3/L	P326601	
	SM 2540 C-97	TDS	438	A	mg/L	P326999	
	SM 2540 D-97	TSS	4	IA	mg/L	P326845	
	SM 4500 F-C-97	Fluoride	0.33		mg F/L	P326605	
1904380	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P326467	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P326501	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.082		mg N/L	P326525	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P326757	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P326871	
1904382	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P326479	
1904388	EPA 200.7 Rev. 4.4	Calcium	52.1		mg/L	P326516	
		Iron	30	U	ug/L	P326516	
		Magnesium	16.1		mg/L	P326516	
		Potassium	7.1		mg/L	P326516	
		Sodium	63.5		mg/L	P326516	
		Zinc	5.0	U	ug/L	P326516	
	EPA 200.8 Rev. 5.4	Arsenic	1.31		ug/L	P326516	
		Beryllium	0.010	U	ug/L	P326516	
		Cadmium	0.020	U	ug/L	P326516	
		Chromium	0.40	U	ug/L	P326516	
		Copper	0.24	I	ug/L	P326516	
		Lead	0.050	U	ug/L	P326516	
		Nickel	0.20	U	ug/L	P326516	
		Silver	0.010	U	ug/L	P326516	

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: WCA1 West @ C39 Canal **Collection Date/Time: 06/07/2017 12:10**

Field ID: G5SE0019 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1904379	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P326477	
	EPA 300.0 Rev. 2.1	Chloride	100		mg Cl/L	P326949	
		Sulfate	45		mg SO4/L	P326953	
	SM 2120 B	Color (true)	86		PCU	P326474	
	SM 2320 B-97	Total Alkalinity	157		mg CaCO3/L	P326601	
	SM 2540 C-97	TDS	456		mg/L	P326998	
	SM 2540 D-97	TSS	2	I	mg/L	P326844	
	SM 4500 F-C-97	Fluoride	0.36		mg F/L	P326605	
1904381	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P326467	

Field ID: G5SE0019 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1904381	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P326501	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.080		mg N/L	P326525	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P326757	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P326871	
1904383	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P326479	
1904389	EPA 200.7 Rev. 4.4	Calcium	56.1		mg/L	P326516	
		Iron	30	U	ug/L	P326516	
		Magnesium	17.2		mg/L	P326516	
		Potassium	7.5		mg/L	P326516	
		Sodium	67.3		mg/L	P326516	
		Zinc	5.0	U	ug/L	P326516	
	EPA 200.8 Rev. 5.4	Arsenic	1.41		ug/L	P326516	
		Beryllium	0.010	U	ug/L	P326516	
		Cadmium	0.020	U	ug/L	P326516	
		Chromium	0.40	U	ug/L	P326516	
		Copper	0.24	I	ug/L	P326516	
		Lead	0.054	I	ug/L	P326516	
		Nickel	0.20	U	ug/L	P326516	
		Silver	0.010	U	ug/L	P326516	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326477

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326516

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

Component	Result	Code	Units
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: P326949

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326953

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326501

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326525

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326757

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326479

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

Reference Method: SM 2120 B
Batch ID: P326474

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P326601

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

Reference Method: SM 2540 C-97
Batch ID: P326998

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P326999

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P326844

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P326845

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P326605

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P326871

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: P326516

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	98.5		P	85 - 115
Sodium	103		P	85 - 115
Zinc	97.5		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Beryllium	95.5		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	100		P	85 - 115
Copper	100		P	85 - 115
Lead	97.9		P	85 - 115
Nickel	102		P	85 - 115
Silver	98.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326953

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326501

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326525

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: P326757

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326479

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P326601

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

Reference Method: SM 4500 F-C-97
Batch ID: P326605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P326871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903833	Calcium	100		P	80 - 120
1903833	Iron	107		P	80 - 120
1903833	Magnesium	104		P	80 - 120
1903833	Potassium	101		P	80 - 120
1903833	Sodium	101		P	80 - 120
1903833	Zinc	101		P	80 - 120
1904095	Calcium	106		P	80 - 120
1904095	Iron	104	104	P/P	80 - 120
1904095	Magnesium	105		P	80 - 120
1904095	Potassium	98.7	101	P/P	80 - 120
1904095	Sodium	107		P	80 - 120
1904095	Zinc	100	98.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903833	Arsenic	106		P	80 - 120
1903833	Beryllium	100		P	80 - 120
1903833	Cadmium	103		P	80 - 120
1903833	Chromium	98.0		P	80 - 120
1903833	Copper	96.9		P	80 - 120
1903833	Lead	101		P	80 - 120
1903833	Nickel	98.3		P	80 - 120
1903833	Silver	98.7		P	80 - 120
1904095	Arsenic	106	106	P/P	80 - 120
1904095	Beryllium	97.4	98.3	P/P	80 - 120
1904095	Cadmium	106	105	P/P	80 - 120
1904095	Chromium	97.1	97.3	P/P	80 - 120
1904095	Copper	98.5	98.4	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904095	Lead	100	100	P/P	80 - 120
1904095	Nickel	99.8	99.8	P/P	80 - 120
1904095	Silver	98.7	98.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904366	Chloride	99.8		P	90 - 110
1904471	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904366	Sulfate	101		P	90 - 110
1904471	Sulfate	108		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904473	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904373	Kjeldahl Nitrogen	107	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904367	NO2NO3-N	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904380	Total-P	103	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904382	O-Phosphate-P	98.8	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P326605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P326605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904305	Fluoride	98.2	98.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P326871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905300	Organic Carbon	99.1	96.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904350	Turbidity	5.26	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326516

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904095	Calcium	1.27	Spike	P	0 - 20
1904095	Iron	0.201	Spike	P	0 - 20
1904095	Magnesium	1.32	Spike	P	0 - 20
1904095	Potassium	1.29	Spike	P	0 - 20
1904095	Sodium	2.22	Spike	P	0 - 20
1904095	Zinc	1.98	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326516

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904095	Arsenic	0.762	Spike	P	0 - 20
1904095	Beryllium	0.921	Spike	P	0 - 20
1904095	Cadmium	1.52	Spike	P	0 - 20
1904095	Chromium	0.160	Spike	P	0 - 20
1904095	Copper	0.119	Spike	P	0 - 20
1904095	Lead	0.519	Spike	P	0 - 20
1904095	Nickel	0.0363	Spike	P	0 - 20
1904095	Silver	0.409	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904366	Chloride	2.45	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904366	Sulfate	1.75	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904473	Ammonia-N	0.201	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904373	Kjeldahl Nitrogen	0.0407	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904367	NO2NO3-N	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904380	Total-P	3.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904382	O-Phosphate-P	0.505	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P326474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904448	Color (true)	1.18	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P326601

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904305	Total Alkalinity	1.00	Sample	P	0 - 4.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P326998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904350	TDS	1.34	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P326999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904378	TDS	0.229	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P326605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904305	Fluoride	0.500	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P326871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905300	Organic Carbon	2.01	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 350.1 Rev. 2.0
Run ID: A76961
Included Lab Sample IDs: 1904380, 1904381

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76964
Included Lab Sample IDs: 1904378, 1904379

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76965
Included Lab Sample IDs: 1904382, 1904383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	102	P/P	90 - 110
O-Phosphate-P	102	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76981
Included Lab Sample IDs: 1904380, 1904381

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

Reference Method: SM 2320 B-97
Run ID: A77003
Included Lab Sample IDs: 1904378, 1904379

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

Reference Method: SM 4500 F-C-97
Run ID: A77003
Included Lab Sample IDs: 1904378, 1904379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	98.5	P/P	90 - 110
Fluoride	99.0	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77022
Included Lab Sample IDs: 1904388, 1904389

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	99.9	99.9	P/P	90 - 110
Sodium	103	103	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77055
Included Lab Sample IDs: 1904388, 1904389

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.3	99.8	P/P	90 - 110
Beryllium	98.7	99.2	P/P	90 - 110
Cadmium	98.6	99.5	P/P	90 - 110
Chromium	98.1	99.5	P/P	90 - 110
Copper	97.9	98.4	P/P	90 - 110
Lead	94.1	92.3	P/P	90 - 110
Nickel	97.8	97.6	P/P	90 - 110
Silver	97.4	98.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77076
Included Lab Sample IDs: 1904378, 1904379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	102	P/P	90 - 110
Sulfate	107	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77079
Included Lab Sample IDs: 1904380, 1904381

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

Reference Method: SM 5310 B-00
Run ID: A77100
Included Lab Sample IDs: 1904380, 1904381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.0	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77106
Included Lab Sample IDs: 1904380, 1904381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.0	P/P	90 - 110
Total-P	99.0	99.2	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						5.26	
EPA 200.7 Rev. 4.4	Calcium	102	100	106				1.27
	Iron	104	107	104	104			0.201
	Magnesium	103	104	105				1.32
	Potassium	98.5	101	98.7	101			1.29
	Sodium	103	101	107				2.22
	Zinc	97.5	101	100	98.1			1.98
EPA 200.8 Rev. 5.4	Arsenic	105	106	106	106			0.762
	Beryllium	95.5	100	97.4	98.3			0.921
	Cadmium	103	103	106	105			1.52
	Chromium	100	98.0	97.1	97.3			0.160
	Copper	100	96.9	98.5	98.4			0.119
	Lead	97.9	101	100	100			0.519
	Nickel	102	98.3	99.8	99.8			0.0363
	Silver	98.8	98.7	98.7	98.3			0.409
EPA 300.0 Rev. 2.1	Chloride	98.0	99.8	108			2.45	
	Sulfate	98.4	101	108			1.75	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	101				0.201
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	107	107				0.0407
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	103				1.31
EPA 365.1 Rev. 2.0	Total-P	103	103	99.3				3.45
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	98.8	99.3				0.505
SM 2120 B	Color (true)						1.18	
SM 2320 B-97	Total Alkalinity	104					1.00	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 2540 C-97	TDS					1.34	
	TDS					0.229	
SM 4500 F-C-97	Fluoride	97.9	98.2	98.8			0.500
SM 5310 B-00	Organic Carbon	94.1	99.1	96.2			2.01

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1904378, 1904379
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1904388, 1904389
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1904388, 1904389
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1904378, 1904379
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1904378, 1904379
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1904380, 1904381
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1904380, 1904381
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1904380, 1904381
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1904380, 1904381
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1904382, 1904383
SM 2120 B / E31780	True Color measured at 450 nm	1904378, 1904379
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1904378, 1904379
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1904378, 1904379
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1904378, 1904379
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1904378, 1904379
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1904380, 1904381

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	06/08/2017			06/08/2017 14:51	Sima Feizi	1904378, 1904379
EPA 200.7 Rev. 4.4	06/08/2017	06/09/2017	Elliott D. Healy	06/12/2017	Betina Topolski	1904388, 1904389
EPA 200.8 Rev. 5.4	06/08/2017	06/09/2017	Elliott D. Healy	06/13/2017	Robert K Palmer	1904388
	06/08/2017	06/09/2017	Elliott D. Healy	06/14/2017	Robert K Palmer	1904389
EPA 300.0 Rev. 2.1	06/08/2017			06/16/2017	Julia Storbeck	1904378, 1904379
EPA 350.1 Rev. 2.0	06/08/2017			06/08/2017	Julie Michelle Frank	1904380, 1904381
EPA 351.2 Rev. 2.0	06/08/2017	06/09/2017	Adrian Shelby	06/14/2017	Joseph Suarez	1904380, 1904381
EPA 353.2 Rev. 2.0	06/08/2017			06/09/2017	Beverly Y. Sanders	1904380, 1904381
EPA 365.1 Rev. 2.0	06/08/2017	06/14/2017	Vijayalakshmi Reddy	06/15/2017	Lipi Saha	1904380, 1904381
EPA 365.1 Rev. 2.0 dissolved	06/08/2017			06/08/2017 14:44	Anthony C. Onicha	1904382
	06/08/2017			06/08/2017 14:59	Anthony C. Onicha	1904383
SM 2120 B	06/08/2017			06/08/2017 15:28	Tanya Welborn	1904378
	06/08/2017			06/08/2017 15:29	Tanya Welborn	1904379
SM 2320 B-97	06/08/2017			06/10/2017	Dale L. Simmons	1904378, 1904379
SM 2540 C-97	06/08/2017			06/12/2017	Sima Feizi	1904378, 1904379
SM 2540 D-97	06/08/2017			06/12/2017	Sima Feizi	1904378, 1904379
SM 4500 F-C-97	06/08/2017			06/10/2017	Dale L. Simmons	1904378, 1904379
SM 5310 B-00	06/08/2017			06/14/2017	Christopher Armour	1904380, 1904381