Chemical Analysis Report

SE-DIST-2017-06-09-02

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

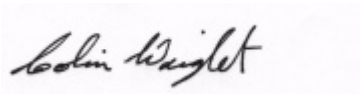
Event Description: **SMP- Dade Purple Run**
Request ID: **RQ-2017-06-05-26**
Customer: **SE-DIST**
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 05-JUL-2017 11:14



NON-CONFORMANCE REPORT INCLUDED

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: C-7/LITTLE RIVER (LR-10) **Collection Date/Time: 06/06/2017 12:30**

Field ID: G4SELR10 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905331	EPA 180.1 Rev. 2.0	Turbidity	0.55	Q	NTU	P326546	
	EPA 300.0 Rev. 2.1	Chloride	60		mg Cl/L	P327033	
		Sulfate	2.2		mg SO4/L	P327037	
	SM 2120 B	Color (true)	40	Q	PCU	P326585	
	SM 2320 B-97	Total Alkalinity	197		mg CaCO3/L	P326792	
	SM 2540 C-97	TDS	336	A	mg/L	P327095	
	SM 2540 D-97	TSS	3	IA	mg/L	P327096	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P326794	
1905332	EPA 350.1 Rev. 2.0	Ammonia-N	2.8		mg N/L	P326551	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	4.0		mg N/L	P326721	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P326679	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P326675	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P326871	
1905333	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P326576	
1905366	EPA 200.7 Rev. 4.4	Calcium	62.4		mg/L	P326645	
		Iron	65	I	ug/L	P326645	
		Magnesium	8.49		mg/L	P326645	
		Potassium	4.7		mg/L	P326645	
		Sodium	38.8		mg/L	P326645	
		Zinc	5.0	U	ug/L	P326645	
	EPA 200.8 Rev. 5.4	Arsenic	0.67		ug/L	P326645	
		Cadmium	0.020	U	ug/L	P326645	
		Chromium	0.40	U	ug/L	P326645	
		Copper	0.20	U	ug/L	P326645	
		Lead	0.085	I	ug/L	P326645	
		Nickel	0.32	I	ug/L	P326645	
		Silver	0.010	U	ug/L	P326645	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired prior to receipt.
SM 2120 B: The sample expired prior to receipt.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for copper are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 6487

Event(s)	Job(s)	Sample(s)	Test(s)
SE-DIST-2017-06-09-02			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: FedEx code:811171118102

Non-Conformance Report

NCR ID: 6487

Event(s)	Job(s)	Sample(s)	Test(s)

Resolution: Customer contacted, email correspondence attached to sample submittal forms.

CHL-SUITE-W test was not filtered. This analysis will be given a value of No Result with an "OQ" qualifier.

Authorized by/Date: Ramsey K. White 6/26/2017

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326546

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326645

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: P326645

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: P327033

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327037

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327037

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326551

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326721

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326679

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326675

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326576

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

Reference Method: SM 2120 B
Batch ID: P326585

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P326792

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

Reference Method: SM 2540 C-97
Batch ID: P327095

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P327096

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P326794

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: P326645

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	99.9		P	85 - 115
Sodium	103		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326645

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	101		P	85 - 115
Copper	97.9		P	85 - 115
Lead	100		P	85 - 115
Nickel	99.7		P	85 - 115
Silver	99.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327033

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327037

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326551

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: P326721

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: P326679

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: P326675

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326576

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.1		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P326792

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

Reference Method: SM 4500 F-C-97
Batch ID: P326794

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		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: P326645

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904698	Calcium	107		P	80 - 120
1904698	Iron	109		P	80 - 120
1904698	Magnesium	111		P	80 - 120
1904698	Potassium	103		P	80 - 120
1904698	Sodium	105		P	80 - 120
1904698	Zinc	102		P	80 - 120
1904987	Calcium	109	109	P/P	80 - 120
1904987	Iron	109	109	P/P	80 - 120
1904987	Magnesium	111	111	P/P	80 - 120
1904987	Potassium	102	101	P/P	80 - 120
1904987	Sodium	104	104	P/P	80 - 120
1904987	Zinc	104	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904698	Arsenic	98.5		P	75 - 125
1904698	Cadmium	97.3		P	75 - 125
1904698	Chromium	92.7		P	75 - 125
1904698	Lead	97.1		P	75 - 125
1904698	Nickel	91.8		P	75 - 125
1904698	Silver	98.9		P	75 - 125
1904987	Arsenic	103	102	P/P	80 - 120
1904987	Cadmium	104	102	P/P	80 - 120
1904987	Chromium	105	103	P/P	80 - 120
1904987	Copper	101	99.3	P/P	80 - 120
1904987	Lead	103	102	P/P	80 - 120
1904987	Nickel	100	98.8	P/P	80 - 120
1904987	Silver	101	99.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904975	Chloride	102		P	90 - 110
1905441	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904975	Sulfate	98.1		P	90 - 110
1905441	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905308	Ammonia-N	99.8	110	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905308	Kjeldahl Nitrogen	99.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326679

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905300	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326675

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905300	Total-P	102	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905303	O-Phosphate-P	94.0	95.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P326794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905012	Fluoride	97.6	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: P326546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905087	Turbidity	0.358	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904987	Calcium	0.0791	Spike	P	0 - 20
1904987	Iron	0.151	Spike	P	0 - 20
1904987	Magnesium	0.0163	Spike	P	0 - 20
1904987	Potassium	0.325	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904987	Sodium	0.0290	Spike	P	0 - 20
1904987	Zinc	1.36	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904987	Arsenic	1.40	Spike	P	0 - 20
1904987	Cadmium	2.14	Spike	P	0 - 20
1904987	Chromium	2.51	Spike	P	0 - 20
1904987	Copper	1.38	Spike	P	0 - 20
1904987	Lead	1.37	Spike	P	0 - 20
1904987	Nickel	1.54	Spike	P	0 - 20
1904987	Silver	1.74	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904975	Chloride	0.330	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904975	Sulfate	2.51	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905308	Ammonia-N	6.02	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905308	Kjeldahl Nitrogen	0.895	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326679

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905300	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326675

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905300	Total-P	2.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905303	O-Phosphate-P	1.06	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P326585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904981	Color (true)	4.64	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P326792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905012	Total Alkalinity	0.140	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P327095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905331	TDS	3.87	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P326794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905012	Fluoride	1.04	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76994
Included Lab Sample IDs: 1905331

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76995
Included Lab Sample IDs: 1905332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76999
Included Lab Sample IDs: 1905333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	99.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A77000
Included Lab Sample IDs: 1905331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	100	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77033
Included Lab Sample IDs: 1905332

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77056
Included Lab Sample IDs: 1905366

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77076
Included Lab Sample IDs: 1905331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	100	P/P	90 - 110
Sulfate	108	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A77078
Included Lab Sample IDs: 1905331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77078
Included Lab Sample IDs: 1905331

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77083
Included Lab Sample IDs: 1905332

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

Reference Method: SM 5310 B-00
Run ID: A77100
Included Lab Sample IDs: 1905332

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77142
Included Lab Sample IDs: 1905332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77193
Included Lab Sample IDs: 1905366

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.6	98.5	P/P	90 - 110
Cadmium	98.3	98.8	P/P	90 - 110
Chromium	100	101	P/P	90 - 110
Copper	97.9	98.0	P/P	90 - 110
Lead	99.4	98.9	P/P	90 - 110
Silver	98.4	99.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77324
Included Lab Sample IDs: 1905366

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

Quality Assurance Report
Calibration Verification

* 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						0.358	
EPA 200.7 Rev. 4.4	Calcium	108	109	109	107			0.0791
	Iron	107	109	109	109			0.151
	Magnesium	109	111	111	111			0.0163
	Potassium	99.9	102	101	103			0.325
	Sodium	103	104	104	105			0.0290
	Zinc	100	104	102	102			1.36
EPA 200.8 Rev. 5.4	Arsenic	103	98.5	103	102			1.40
	Cadmium	102	97.3	104	102			2.14
	Chromium	101	92.7	105	103			2.51
	Copper	97.9	101	99.3				1.38
	Lead	100	97.1	103	102			1.37
	Nickel	99.7	91.8	100	98.8			1.54
	Silver	99.8	98.9	101	99.2			1.74
EPA 300.0 Rev. 2.1	Chloride	104	102	106			0.330	
	Sulfate	104	98.1	103			2.51	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.8	110				6.02
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	99.0	100				0.895
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103				0.0
EPA 365.1 Rev. 2.0	Total-P	102	102	99.1				2.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.1	94.0	95.3				1.06
SM 2120 B	Color (true)						4.64	
SM 2320 B-97	Total Alkalinity	103					0.140	
SM 2540 C-97	TDS						3.87	
SM 4500 F-C-97	Fluoride	97.5	97.6	98.8				1.04
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	1905331
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1905366
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1905366
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1905331
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1905331
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1905332
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1905332
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1905332

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1905332
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1905333
SM 2120 B / E31780	True Color measured at 450 nm	1905331
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1905331
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1905331
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1905331
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1905331
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1905332

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	06/09/2017			06/09/2017 16:38	Sima Feizi	1905331
EPA 200.7 Rev. 4.4	06/09/2017	06/12/2017	Elliott D. Healy	06/13/2017	Betina Topolski	1905366
EPA 200.8 Rev. 5.4	06/09/2017	06/12/2017	Elliott D. Healy	06/20/2017	Nadine Brooks	1905366
	06/09/2017	06/12/2017	Elliott D. Healy	06/25/2017	Robert K Palmer	1905366
EPA 300.0 Rev. 2.1	06/09/2017			06/17/2017	Julia Storbeck	1905331
EPA 350.1 Rev. 2.0	06/09/2017			06/09/2017	Julie Michelle Frank	1905332
EPA 351.2 Rev. 2.0	06/09/2017	06/14/2017	Adrian Shelby	06/16/2017	Joseph Suarez	1905332
EPA 353.2 Rev. 2.0	06/09/2017			06/13/2017	Beverly Y. Sanders	1905332
EPA 365.1 Rev. 2.0	06/09/2017	06/13/2017	Adrian Shelby	06/14/2017	Lipi Saha	1905332
EPA 365.1 Rev. 2.0 dissolved	06/09/2017			06/09/2017 17:06	Anthony C. Onicha	1905333
SM 2120 B	06/09/2017			06/09/2017 16:18	Tanya Welborn	1905331
SM 2320 B-97	06/09/2017			06/13/2017	Dale L. Simmons	1905331
SM 2540 C-97	06/09/2017			06/13/2017	Yijie Li	1905331
SM 2540 D-97	06/09/2017			06/13/2017	Yijie Li	1905331
SM 4500 F-C-97	06/09/2017			06/13/2017	Dale L. Simmons	1905331
SM 5310 B-00	06/09/2017			06/14/2017	Christopher Armour	1905332