

Chemical Analysis Report

SE-DIST-2016-07-27-02

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

Event Description: **SMP-Taylor creek/Turkey slough**

Request ID: **RQ-2016-06-27-20**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

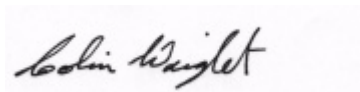
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

For additional information please contact

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 22-AUG-2016 13:11

A handwritten signature in black ink, appearing to read "Colin Wright", is positioned on a light-colored rectangular background.

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 @ SR70

Collection Date/Time: 07/26/2016 12:30

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1819472	EPA 180.1 Rev. 2.0	Turbidity	7.1	A	NTU	P308766	
	EPA 300.0 Rev. 2.1	Chloride	36		mg Cl/L	P309376	
		Sulfate	20		mg SO4/L	P309381	
	SM 2120 B	Color (true)	110		PCU	P308713	
	SM 2320 B-97	Total Alkalinity	111		mg CaCO3/L	P308918	
	SM 2540 C-97	TDS	251		mg/L	P309413	
	SM 2540 D-97	TSS	18		mg/L	P309010	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P308921	
1819473	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P308939	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P309069	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P309032	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P309280	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P309197	
1819474	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P308733	
1819495	EPA 200.7 Rev. 4.4	Calcium	48.7		mg/L	P308969	
		Iron	500		ug/L	P308969	
		Magnesium	4.85		mg/L	P308969	
		Potassium	6.0		mg/L	P308969	
		Sodium	23.9		mg/L	P308969	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P308969	
		Arsenic	1.13		ug/L	P308969	
		Cadmium	0.020	U	ug/L	P308969	
		Chromium	0.75		ug/L	P308969	
		Copper	0.95		ug/L	P308969	
		Lead	0.55		ug/L	P308969	
		Nickel	0.67		ug/L	P308969	
		Silver	0.0050	U	ug/L	P308969	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high 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: TAYLOR CREEK @ SR 70 BLANK

Collection Date/Time: 07/26/2016 12:40

Field ID: BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1819466	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P308765	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P309376	
		Sulfate	0.20	U	mg SO4/L	P309381	
	SM 2120 B	Color (true)	2.5	U	PCU	P308713	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P308918	
	SM 2540 C-97	TDS	15	U	mg/L	P309411	
	SM 2540 D-97	TSS	2	U	mg/L	P309008	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P308921	
1819468	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P308939	

Field ID: BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1819468	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P309585	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P309031	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P309280	
	SM 5310 B-00	Organic Carbon	0.62	I	mg C/L	P309197	
1819470	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P308733	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high 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.

SM 5310 B-00: The result was confirmed on 08/08/2016.

Sample Location: 5154C

Collection Date/Time: 07/26/2016 13:45

Field ID: G4SE0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1819467	EPA 180.1 Rev. 2.0	Turbidity	5.0		NTU	P308765	
	EPA 300.0 Rev. 2.1	Chloride	140		mg Cl/L	P309376	
		Sulfate	40		mg SO4/L	P309381	
		Color (true)	300		PCU	P308713	
	SM 2320 B-97	Total Alkalinity	60		mg CaCO3/L	P308918	
	SM 2540 C-97	TDS	449	A	mg/L	P309413	
	SM 2540 D-97	TSS	4	I	mg/L	P309010	
1819469	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P308921	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P308939	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P309069	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.037		mg N/L	P309032	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P309280	
1819471	SM 5310 B-00	Organic Carbon	29		mg C/L	P309197	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P308733	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high 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: P308765

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P308766

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

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: P308969

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: P309376

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309381

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308939

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309585

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309031

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309032

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309280

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308733

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

Reference Method: SM 2120 B
Batch ID: P308713

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P308918

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

Reference Method: SM 2540 C-97
Batch ID: P309411

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P309413

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P309008

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P309010

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P308921

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P309197

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: P308969

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.8		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	101		P	85 - 115
Copper	92.6		P	85 - 115
Lead	94.9		P	85 - 115
Nickel	93.0		P	85 - 115
Silver	94.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309376

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309381

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	92.1		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308939

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309585

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: P309031

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309032

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309280

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: P308733

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

Reference Method: SM 2320 B-97
Batch ID: P308918

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

Reference Method: SM 4500 F-C-97
Batch ID: P308921

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P309197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819297	Calcium	104		P	80 - 120
1819297	Iron	105		P	80 - 120
1819297	Magnesium	104		P	80 - 120
1819297	Potassium	102		P	80 - 120
1819297	Sodium	102		P	80 - 120
1819297	Zinc	97.2		P	80 - 120
1820259	Calcium	107	110	P/P	80 - 120
1820259	Iron	107	108	P/P	80 - 120
1820259	Magnesium	109	111	P/P	80 - 120
1820259	Potassium	109	110	P/P	80 - 120
1820259	Sodium	105	107	P/P	80 - 120
1820259	Zinc	100	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819297	Arsenic	96.2		P	80 - 120
1819297	Cadmium	98.2		P	80 - 120
1819297	Chromium	100		P	80 - 120
1819297	Copper	88.7		P	80 - 120
1819297	Lead	96.3		P	80 - 120
1819297	Nickel	90.4		P	80 - 120
1819297	Silver	95.9		P	80 - 120
1820259	Arsenic	95.6	97.7	P/P	80 - 120
1820259	Cadmium	102	101	P/P	80 - 120
1820259	Chromium	105	104	P/P	80 - 120
1820259	Copper	92.9	94.2	P/P	80 - 120
1820259	Lead	98.2	98.0	P/P	80 - 120
1820259	Nickel	92.6	94.7	P/P	80 - 120
1820259	Silver	97.6	97.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309376

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819651	Chloride	98.1		P	90 - 110
1822305	Chloride	95.4	95.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819651	Sulfate	94.4		P	90 - 110
1822305	Sulfate	96.1	96.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819389	Ammonia-N	104	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309031

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819363	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819473	NO2NO3-N	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819464	Total-P	100	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819371	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P309197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819390	Organic Carbon	105		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P308765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819442	Turbidity	3.73	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P308766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819472	Turbidity	0.703	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820259	Calcium	1.98	Spike	P	0 - 20
1820259	Iron	1.38	Spike	P	0 - 20
1820259	Magnesium	1.74	Spike	P	0 - 20
1820259	Potassium	1.58	Spike	P	0 - 20
1820259	Sodium	1.32	Spike	P	0 - 20
1820259	Zinc	5.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820259	Arsenic	2.23	Spike	P	0 - 20
1820259	Cadmium	1.73	Spike	P	0 - 20
1820259	Chromium	0.582	Spike	P	0 - 20
1820259	Copper	1.32	Spike	P	0 - 20
1820259	Lead	0.287	Spike	P	0 - 20
1820259	Nickel	2.21	Spike	P	0 - 20
1820259	Silver	0.438	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309376

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822305	Chloride	0.0134	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822305	Sulfate	0.00800	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819389	Ammonia-N	0.994	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819462	Kjeldahl Nitrogen	5.49	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820931	Kjeldahl Nitrogen	1.39	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309031

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819363	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819473	NO2NO3-N	0.397	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819464	Total-P	0.532	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819371	O-Phosphate-P	0.781	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P308713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819115	Color (true)	0.173	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P308918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819279	Total Alkalinity	0.107	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P309411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819115	TDS	6.12	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P309413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819467	TDS	2.67	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P308921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819279	Fluoride	0.470	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P309197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819390	Organic Carbon	0.460	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: A70788
Included Lab Sample IDs: 1819466, 1819467, 1819472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	85 - 115
Color (true)	102	99.7	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70793
Included Lab Sample IDs: 1819470, 1819471, 1819474

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	99.7	P/P	90 - 110
O-Phosphate-P	99.8	99.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70799
Included Lab Sample IDs: 1819466, 1819467, 1819472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A70799

Included Lab Sample IDs: 1819466, 1819467, 1819472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: SM 2320 B-97

Run ID: A70856

Included Lab Sample IDs: 1819466, 1819467, 1819472

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

Reference Method: SM 4500 F-C-97

Run ID: A70856

Included Lab Sample IDs: 1819466, 1819467, 1819472

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A70861

Included Lab Sample IDs: 1819468, 1819469, 1819473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	99.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70885

Included Lab Sample IDs: 1819466, 1819467, 1819472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.6	P/P	90 - 110
Chloride	99.6	101	P/P	90 - 110
Sulfate	101	96.4	P/P	90 - 110
Sulfate	96.4	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A70894

Included Lab Sample IDs: 1819468, 1819469, 1819473

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A70934

Included Lab Sample IDs: 1819495

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A70934

Included Lab Sample IDs: 1819495

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	101	102	P/P	90 - 110
Zinc	98.9	99.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70940

Included Lab Sample IDs: 1819495

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	97.1	97.5	P/P	90 - 110
Chromium	99.2	99.9	P/P	90 - 110
Lead	94.0	93.2	P/P	90 - 110
Silver	93.7	93.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70945

Included Lab Sample IDs: 1819468, 1819469, 1819473

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70963

Included Lab Sample IDs: 1819495

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.2	94.7	P/P	90 - 110
Copper	94.4	91.5	P/P	90 - 110
Nickel	94.3	92.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70992

Included Lab Sample IDs: 1819469, 1819473

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71009

Included Lab Sample IDs: 1819468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71036

Included Lab Sample IDs: 1819469, 1819473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	96.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71098

Included Lab Sample IDs: 1819468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	95.2	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				3.73	
	Turbidity				0.703	
EPA 200.7 Rev. 4.4	Calcium	106	104 107 110			1.98
	Iron	105	105 107 108			1.38
	Magnesium	107	104 109 111			1.74
	Potassium	103	102 109 110			1.58
	Sodium	104	102 105 107			1.32
	Zinc	100	97.2 100 106			5.22
EPA 200.8 Rev. 5.4	Arsenic	95.8	96.2 95.6 97.7			2.23
	Cadmium	98.3	98.2 102 101			1.73
	Chromium	101	100 105 104			0.582
	Copper	92.6	88.7 92.9 94.2			1.32
	Lead	94.9	96.3 98.2 98.0			0.287
	Nickel	93.0	90.4 92.6 94.7			2.21
	Silver	94.9	95.9 97.6 97.2			0.438
EPA 300.0 Rev. 2.1	Chloride	97.9	95.4 95.4 98.1			0.0134
	Sulfate	92.1	96.1 96.1 94.4			0.0080
EPA 350.1 Rev. 2.0	Ammonia-N	104	104 103			0.994
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106				5.49
	Kjeldahl Nitrogen	107				1.39
EPA 353.2 Rev. 2.0	NO2NO3-N	105	106 106			0.0
	NO2NO3-N	106	99.8			0.397
EPA 365.1 Rev. 2.0	Total-P	102	100 99.9			0.532
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	102 103			0.781
SM 2120 B	Color (true)				0.173	
SM 2320 B-97	Total Alkalinity	103			0.107	
SM 2540 C-97	TDS				6.12	
	TDS				2.67	
SM 4500 F-C-97	Fluoride	100				0.470
SM 5310 B-00	Organic Carbon	100	105			0.460

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1819466, 1819467, 1819472
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1819495

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1819495
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1819466, 1819467, 1819472
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1819466, 1819467, 1819472
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1819468, 1819469, 1819473
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1819468, 1819469, 1819473
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1819468, 1819469, 1819473
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1819468, 1819469, 1819473
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1819470, 1819471, 1819474
SM 2120 B / E31780	True Color measured at 450 nm	1819466, 1819467, 1819472
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1819466, 1819467, 1819472
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1819466, 1819467, 1819472
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1819466, 1819467, 1819472
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1819466, 1819467, 1819472
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1819468, 1819469, 1819473

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	07/27/2016			07/27/2016 16:42	Sima Feizi	1819466, 1819467, 1819472
EPA 200.7 Rev. 4.4	07/27/2016	08/01/2016	Elliott D. Healy	08/03/2016	Joshua Ayres	1819495
EPA 200.8 Rev. 5.4	07/27/2016	08/01/2016	Elliott D. Healy	08/04/2016	Charles J. Peterson	1819495
EPA 300.0 Rev. 2.1	07/27/2016			08/05/2016	Ping Hua	1819466, 1819467, 1819472
EPA 350.1 Rev. 2.0	07/27/2016			07/29/2016	Julie Michelle Frank	1819468, 1819469, 1819473
EPA 351.2 Rev. 2.0	07/27/2016	08/03/2016	Sofia Elnemr	08/04/2016	Christopher Armour	1819469, 1819473
	07/27/2016	08/11/2016	Martin Acosta	08/12/2016	Christopher Armour	1819468
EPA 353.2 Rev. 2.0	07/27/2016			08/02/2016	Peter D. Kaus	1819468, 1819469, 1819473
EPA 365.1 Rev. 2.0	07/27/2016	08/05/2016	Vijayalakshmi Reddy	08/08/2016	Lipi Saha	1819469, 1819473
	07/27/2016	08/05/2016	Vijayalakshmi Reddy	08/09/2016	Lipi Saha	1819468
EPA 365.1 Rev. 2.0 dissolved	07/27/2016			07/27/2016 15:43	Julia Storbeck	1819470
	07/27/2016			07/27/2016 15:52	Julia Storbeck	1819471
	07/27/2016			07/27/2016 15:53	Julia Storbeck	1819474
SM 2120 B	07/27/2016			07/27/2016 14:59	Rochelle Y Jackson	1819466
	07/27/2016			07/27/2016 15:01	Rochelle Y Jackson	1819472
	07/27/2016			07/27/2016 15:08	Rochelle Y Jackson	1819467
SM 2320 B-97	07/27/2016			07/30/2016	Dale L. Simmons	1819466, 1819467, 1819472
SM 2540 C-97	07/27/2016			07/29/2016	Yijie Li	1819466, 1819467, 1819472
SM 2540 D-97	07/27/2016			07/29/2016	Yijie Li	1819466, 1819467, 1819472
SM 4500 F-C-97	07/27/2016			07/30/2016	Dale L. Simmons	1819466, 1819467, 1819472
SM 5310 B-00	07/27/2016			08/03/2016	Sofia Elnemr	1819468, 1819469, 1819473