

Chemical Analysis Report

SE-DIST-2016-05-11-01

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

Event Description: **SMP-With Trend**
Request ID: **RQ-2016-05-09-74**
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: Jordan Skaggs

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

Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 08-JUN-2016 09:59

A handwritten signature in black ink, appearing to read 'Timothy W. Fitzpatrick', with a stylized flourish at the end.

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: CI-Block Creek @ Old Cutler

Collection Date/Time: 05/10/2016 10:15

Field ID: G4SE0086

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797372	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P304130	
	EPA 300.0 Rev. 2.1	Chloride	52		mg Cl/L	P304773	
		Sulfate	11		mg SO4/L	P304774	
	SM 2120 B	Color (true)	32	A	PCU	P304065	
	SM 2320 B-97	Total Alkalinity	190		mg CaCO3/L	P304665	
	SM 2540 C-97	TDS	336		mg/L	P304855	
	SM 2540 D-97	TSS	2	I	mg/L	P304755	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P304668	
1797373	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P304317	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99	J	mg N/L	P304699	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.4		mg N/L	P304525	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P305433	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P304979	
1797374	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P304077	
1797378	EPA 200.7 Rev. 4.4	Calcium	76.5		mg/L	P304180	
		Iron	130		ug/L	P304180	
		Magnesium	8.01		mg/L	P304180	
		Potassium	6.2		mg/L	P304180	
		Sodium	33.7		mg/L	P304180	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P304180	
		Arsenic	0.84		ug/L	P304180	
		Cadmium	0.020	U	ug/L	P304180	
		Chromium	0.064	I	ug/L	P304180	
		Copper	0.35	I	ug/L	P304180	
		Lead	0.050	U	ug/L	P304180	
		Nickel	0.37		ug/L	P304180	
		Silver	0.0050	U	ug/L	P304180	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

EPA 200.7 Rev. 4.4: The calcium matrix spike recoveries are unavailable due to high analyte concentration in the QC sample.

Sample Location: L-5 @ G206, Holey Land

Collection Date/Time: 05/10/2016 14:00

Field ID: G5SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797366	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P304129	
	EPA 300.0 Rev. 2.1	Chloride	70		mg Cl/L	P304773	
		Sulfate	15		mg SO4/L	P304774	
	SM 2120 B	Color (true)	110		PCU	P304064	
	SM 2320 B-97	Total Alkalinity	235		mg CaCO3/L	P304665	
	SM 2540 C-97	TDS	436		mg/L	P304855	
	SM 2540 D-97	TSS	2	I	mg/L	P304755	
	SM 4500 F-C-97	Fluoride	0.32		mg F/L	P304668	
1797368	EPA 350.1 Rev. 2.0	Ammonia-N	0.070		mg N/L	P304317	

Field ID: G5SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797368	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P304902	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.098		mg N/L	P304525	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P305324	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P304852	
1797370	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P304077	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: L-5 @ G205, Holey Land

Collection Date/Time: 05/10/2016 14:15

Field ID: G5SE0032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797367	EPA 180.1 Rev. 2.0	Turbidity	1.2	A	NTU	P304130	
	EPA 300.0 Rev. 2.1	Chloride	67		mg Cl/L	P304773	
		Sulfate	9.8		mg SO4/L	P304774	
	SM 2120 B	Color (true)	120		PCU	P304065	
	SM 2320 B-97	Total Alkalinity	249		mg CaCO3/L	P304665	
	SM 2540 C-97	TDS	439		mg/L	P304855	
	SM 2540 D-97	TSS	2	I	mg/L	P304755	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P304668	
1797369	EPA 350.1 Rev. 2.0	Ammonia-N	0.076		mg N/L	P304317	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P304902	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P304525	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P305324	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P304852	
1797371	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P304077	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P304129

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P304130

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P304180

Component	Result	Code	Units
Calcium	0.075	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304180

Component	Result	Code	Units
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: P304180

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: P304773

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304774

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304317

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304699

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304902

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304525

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304525

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305324

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305433

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304077

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

Reference Method: SM 2120 B
Batch ID: P304064

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P304065

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P304665

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

Reference Method: SM 2540 C-97
Batch ID: P304855

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P304755

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P304668

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P304852

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P304979

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: P304180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	101		P	85 - 115
Sodium	105		P	85 - 115
Zinc	98.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.5		P	85 - 115
Cadmium	94.3		P	85 - 115
Chromium	97.4		P	85 - 115
Copper	104		P	85 - 115
Lead	95.9		P	85 - 115
Nickel	97.7		P	85 - 115
Silver	91.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304773

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.2		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304317

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304699

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304902

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: P304525

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305324

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305433

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304077

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

Reference Method: SM 2320 B-97
Batch ID: P304665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P304668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.0		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P304852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P304979

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797430	Iron	106	109	P/P	80 - 120
1797430	Magnesium	107		P	80 - 120
1797430	Potassium	102	105	P/P	80 - 120
1797430	Sodium	105		P	80 - 120
1797430	Zinc	103	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797430	Arsenic	97.9	97.7	P/P	80 - 120
1797430	Cadmium	98.6	93.9	P/P	80 - 120
1797430	Chromium	98.8	99.0	P/P	80 - 120
1797430	Copper	96.9	93.8	P/P	80 - 120
1797430	Lead	98.3	97.9	P/P	80 - 120
1797430	Nickel	95.8	94.5	P/P	80 - 120
1797430	Silver	91.8	90.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797384	Chloride	97.6		P	90 - 110
1797564	Chloride	97.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797384	Sulfate	94.1		P	90 - 110
1797564	Sulfate	93.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304317

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304317

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797342	Ammonia-N	104	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304699

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797373	Kjeldahl Nitrogen	89.5	93.7	F/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797342	Kjeldahl Nitrogen	107	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797332	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305324

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1800098	Total-P	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1800714	Total-P	97.8	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797471	O-Phosphate-P	98.6	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P304668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797277	Fluoride	98.5	97.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P304852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797333	Organic Carbon	99.8	97.1	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P304979

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797388	Organic Carbon	104		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P304129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797274	Turbidity	1.99	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P304130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797367	Turbidity	19.2	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797430	Calcium	0.634	Spike	P	0 - 20
1797430	Iron	2.19	Spike	P	0 - 20
1797430	Magnesium	1.39	Spike	P	0 - 20
1797430	Potassium	2.00	Spike	P	0 - 20
1797430	Sodium	0.960	Spike	P	0 - 20
1797430	Zinc	2.54	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797430	Arsenic	0.233	Spike	P	0 - 20
1797430	Cadmium	4.82	Spike	P	0 - 20
1797430	Chromium	0.159	Spike	P	0 - 20
1797430	Copper	3.31	Spike	P	0 - 20
1797430	Lead	0.455	Spike	P	0 - 20
1797430	Nickel	1.25	Spike	P	0 - 20
1797430	Silver	1.61	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797384	Chloride	0.107	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797384	Sulfate	3.50	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304317

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797342	Ammonia-N	1.62	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304699

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797373	Kjeldahl Nitrogen	2.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797342	Kjeldahl Nitrogen	0.950	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797332	NO2NO3-N	1.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1800098	Total-P	0.916	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1800714	Total-P	6.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797471	O-Phosphate-P	1.91	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P304064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797326	Color (true)	3.15	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P304065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797372	Color (true)	2.93	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P304665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797277	Total Alkalinity	0.966	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P304855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797329	TDS	6.65	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P304668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797277	Fluoride	0.477	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P304852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797333	Organic Carbon	1.64	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P304979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797388	Organic Carbon	1.86	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: SM 2120 B

Run ID: A69424

Included Lab Sample IDs: 1797366, 1797367, 1797372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	99.3	P/P	90 - 115
Color (true)	98.1	97.8	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A69429

Included Lab Sample IDs: 1797370, 1797371, 1797374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A69439

Included Lab Sample IDs: 1797366, 1797367, 1797372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105
Turbidity	99.0	101	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69475

Included Lab Sample IDs: 1797368, 1797369, 1797373

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69510

Included Lab Sample IDs: 1797378

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.9	95.0	P/P	90 - 110
Cadmium	94.2	94.3	P/P	90 - 110
Copper	98.1	95.9	P/P	90 - 110
Lead	93.6	93.9	P/P	90 - 110
Nickel	97.2	94.8	P/P	90 - 110
Silver	92.8	92.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A69532

Included Lab Sample IDs: 1797378

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	101	99.7	P/P	90 - 110
Sodium	102	100	P/P	90 - 110
Zinc	100	99.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69550

Included Lab Sample IDs: 1797368, 1797369, 1797373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69570

Included Lab Sample IDs: 1797378

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.8	97.5	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A69588

Included Lab Sample IDs: 1797366, 1797367, 1797372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.2	P/P	90 - 110
Total Alkalinity	98.2	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69588

Included Lab Sample IDs: 1797366, 1797367, 1797372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.1	P/P	90 - 110
Fluoride	99.1	99.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A69620

Included Lab Sample IDs: 1797366, 1797367, 1797372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	100	P/P	90 - 110
Chloride	100	101	P/P	90 - 110
Sulfate	98.5	99.2	P/P	90 - 110
Sulfate	99.2	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69634

Included Lab Sample IDs: 1797373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	98.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69642

Included Lab Sample IDs: 1797368, 1797369

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00
 Run ID: A69683
 Included Lab Sample IDs: 1797373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A69705
 Included Lab Sample IDs: 1797368, 1797369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A69793
 Included Lab Sample IDs: 1797368, 1797369

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

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A69851
 Included Lab Sample IDs: 1797373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	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				1.99	
	Turbidity				19.2	
EPA 200.7 Rev. 4.4	Calcium	105				0.634
	Iron	106	106	109		2.19
	Magnesium	104	107			1.39
	Potassium	101	102	105		2.00
	Sodium	105	105			0.960
	Zinc	98.0	103	106		2.54
EPA 200.8 Rev. 5.4	Arsenic	95.5	97.9	97.7		0.233
	Cadmium	94.3	98.6	93.9		4.82
	Chromium	97.4	98.8	99.0		0.159
	Copper	104	96.9	93.8		3.31
	Lead	95.9	98.3	97.9		0.455
	Nickel	97.7	95.8	94.5		1.25
	Silver	91.7	91.8	90.3		1.61
EPA 300.0 Rev. 2.1	Chloride	99.0	97.6	97.1	0.107	
	Sulfate	95.2	94.1	93.6	3.50	
EPA 350.1 Rev. 2.0	Ammonia-N	99.7	104	101		1.62

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.7	89.5	93.7			2.41
	Kjeldahl Nitrogen	104	107	105			0.950
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	100	102			1.48
EPA 365.1 Rev. 2.0	Total-P	101	99.0	100			0.916
	Total-P	99.3	97.8	107			6.23
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	98.6	100			1.91
SM 2120 B	Color (true)					3.15	
	Color (true)					2.93	
SM 2320 B-97	Total Alkalinity	101				0.966	
SM 2540 C-97	TDS					6.65	
SM 4500 F-C-97	Fluoride	96.0	98.5	97.9			0.477
SM 5310 B-00	Organic Carbon	103	99.8	97.1			1.64
	Organic Carbon	97.4	104				1.86

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1797366, 1797367, 1797372
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1797378
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1797378
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1797366, 1797367, 1797372
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1797366, 1797367, 1797372
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1797368, 1797369, 1797373
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1797368, 1797369, 1797373
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1797368, 1797369, 1797373
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1797368, 1797369, 1797373
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1797370, 1797371, 1797374
SM 2120 B / E31780	True Color measured at 450 nm	1797366, 1797367, 1797372
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1797366, 1797367, 1797372
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1797366, 1797367, 1797372
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1797366, 1797367, 1797372
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1797366, 1797367, 1797372
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1797368, 1797369, 1797373

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	05/11/2016			05/11/2016 15:59	Sima Feizi	1797366, 1797367, 1797372
EPA 200.7 Rev. 4.4	05/11/2016	05/12/2016	Elliott D. Healy	05/17/2016	Joshua Ayres	1797378
EPA 200.8 Rev. 5.4	05/11/2016	05/12/2016	Elliott D. Healy	05/16/2016	Charles J. Peterson	1797378
	05/11/2016	05/12/2016	Elliott D. Healy	05/18/2016	Charles J. Peterson	1797378
EPA 300.0 Rev. 2.1	05/11/2016			05/18/2016	Elisa J Lutz	1797366, 1797367, 1797372
EPA 350.1 Rev. 2.0	05/11/2016			05/13/2016	Diana M. Turner	1797368, 1797369, 1797373
EPA 351.2 Rev. 2.0	05/11/2016	05/20/2016	Christopher Armour	05/23/2016	Christopher Armour	1797373
	05/11/2016	05/24/2016	Sofia Elnemr	05/25/2016	Christopher Armour	1797368, 1797369
EPA 353.2 Rev. 2.0	05/11/2016			05/18/2016	Peter D. Kaus	1797368, 1797369, 1797373
EPA 365.1 Rev. 2.0	05/11/2016	06/01/2016	Vijayalakshmi Reddy	06/01/2016	Rochelle Y Jackson	1797368, 1797369
	05/11/2016	06/02/2016	Vijayalakshmi Reddy	06/03/2016	Rochelle Y Jackson	1797373
EPA 365.1 Rev. 2.0 dissolved	05/11/2016			05/11/2016 14:49	Julia Storbeck	1797370
	05/11/2016			05/11/2016 14:50	Julia Storbeck	1797371
	05/11/2016			05/11/2016 14:51	Julia Storbeck	1797374
SM 2120 B	05/11/2016			05/11/2016 14:00	Rochelle Y Jackson	1797366
	05/11/2016			05/11/2016 14:03	Rochelle Y Jackson	1797367
	05/11/2016			05/11/2016 14:05	Rochelle Y Jackson	1797372
SM 2320 B-97	05/11/2016			05/19/2016	Dale L. Simmons	1797366, 1797367, 1797372
SM 2540 C-97	05/11/2016			05/13/2016	Yijie Li	1797366, 1797367, 1797372
SM 2540 D-97	05/11/2016			05/13/2016	Yijie Li	1797366, 1797367, 1797372
SM 4500 F-C-97	05/11/2016			05/19/2016	Dale L. Simmons	1797366, 1797367, 1797372
SM 5310 B-00	05/11/2016			05/24/2016	Diana M. Turner	1797368, 1797369, 1797373