

Chemical Analysis Report

SE-DIST-2016-08-26-01

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

Event Description: **SMP - Palm Beach Glades**

Request ID: **RQ-2016-08-22-48**

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: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 22-SEP-2016 17:16



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 NORTH @ G-301

Collection Date/Time: 08/25/2016 10:10

Field ID: G5SE0046

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827299	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P310420	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P311121	
		Sulfate	110		mg SO4/L	P311124	
		Color (true)	120		PCU	P310423	
	SM 2320 B-97	Total Alkalinity	294		mg CaCO3/L	P310504	
	SM 2540 C-97	TDS	806		mg/L	P311040	
	SM 2540 D-97	TSS	4	I	mg/L	P310853	
	SM 4500 F-C-97	Fluoride	0.53		mg F/L	P310506	
1827301	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P310454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.3		mg N/L	P310795	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.39		mg N/L	P310825	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P310967	
	SM 5310 B-00	Organic Carbon	36		mg C/L	P310904	
1827303	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P310427	
1827309	EPA 200.7 Rev. 4.4	Calcium	120		mg/L	P310571	
		Iron	97	I	ug/L	P310571	
		Magnesium	30.5		mg/L	P310571	
		Potassium	8.8		mg/L	P310571	
		Sodium	115		mg/L	P310571	
		Zinc	5.0	U	ug/L	P310571	
	EPA 200.8 Rev. 5.4	Arsenic	2.97		ug/L	P310571	
		Beryllium	0.016	I	ug/L	P310571	
		Cadmium	0.020	U	ug/L	P310571	
		Chromium	0.26		ug/L	P310571	
		Copper	0.66		ug/L	P310571	
		Lead	0.11	I	ug/L	P310571	
		Nickel	0.91		ug/L	P310571	
		Silver	0.0050	U	ug/L	P310571	

Ref. Method and Comment:

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: WEST PALM BEACH CANAL @ END OF SUPPLY CANAL

Collection Date/Time: 08/25/2016 10:30

Field ID: G5SE0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827293	EPA 180.1 Rev. 2.0	Turbidity	13	A	NTU	P310420	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P311121	
		Sulfate	92		mg SO4/L	P311124	
		Color (true)	140	A	PCU	P310423	
	SM 2320 B-97	Total Alkalinity	323		mg CaCO3/L	P310504	
	SM 2540 C-97	TDS	874	A	mg/L	P311039	
	SM 2540 D-97	TSS	13	A	mg/L	P310852	
	SM 4500 F-C-97	Fluoride	0.49		mg F/L	P310506	

Field ID: G5SE0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827295	EPA 350.1 Rev. 2.0	Ammonia-N	0.099		mg N/L	P310454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.8		mg N/L	P310795	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.44		mg N/L	P311129	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P310966	
	SM 5310 B-00	Organic Carbon	41		mg C/L	P310904	
1827297	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.044		mg P/L	P310427	

Ref. Method and Comment:

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: HILLSCAN 0.25M SOUTH OF L-16 CANAL

Collection Date/Time: 08/25/2016 11:05

Field ID: G5SE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827294	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P310420	
	EPA 300.0 Rev. 2.1	Chloride	79		mg Cl/L	P311121	
		Sulfate	41		mg SO4/L	P311124	
	SM 2120 B	Color (true)	90		PCU	P310423	
	SM 2320 B-97	Total Alkalinity	206		mg CaCO3/L	P310504	
	SM 2540 C-97	TDS	486	A	mg/L	P311040	
	SM 2540 D-97	TSS	15	A	mg/L	P310853	
	SM 4500 F-C-97	Fluoride	0.49		mg F/L	P310506	
1827296	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P310454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P310795	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P311282	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P310966	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P310904	
1827298	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.086		mg P/L	P310427	

Ref. Method and Comment:

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: WCA1 SOUTH

Collection Date/Time: 08/25/2016 12:10

Field ID: G5SE0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827300	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P310420	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P311121	
		Sulfate	43		mg SO4/L	P311124	
	SM 2120 B	Color (true)	79		PCU	P310423	
	SM 2320 B-97	Total Alkalinity	167		mg CaCO3/L	P310504	
	SM 2540 C-97	TDS	456		mg/L	P311040	
	SM 2540 D-97	TSS	2	U	mg/L	P310853	
	SM 4500 F-C-97	Fluoride	0.30		mg F/L	P310506	
1827302	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P310454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P310795	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P310825	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P310967	

Field ID: G5SE0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827302	SM 5310 B-00	Organic Carbon	26		mg C/L	P310904	
1827304	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P310427	
1827310	EPA 200.7 Rev. 4.4	Calcium	60.9		mg/L	P310571	
		Iron	30	U	ug/L	P310571	
		Magnesium	16.1		mg/L	P310571	
		Potassium	6.8		mg/L	P310571	
		Sodium	71.7		mg/L	P310571	
		Zinc	5.0	U	ug/L	P310571	
	EPA 200.8 Rev. 5.4	Arsenic	1.45		ug/L	P310571	
		Beryllium	0.010	U	ug/L	P310571	
		Cadmium	0.020	U	ug/L	P310571	
		Chromium	0.11	I	ug/L	P310571	
		Copper	0.23	I	ug/L	P310571	
		Lead	0.050	U	ug/L	P310571	
		Nickel	0.18	I	ug/L	P310571	
		Silver	0.0050	U	ug/L	P310571	

Ref. Method and Comment:

EPA 350.1 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: P310420

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P310571

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: P310571

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Beryllium	0.010	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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311121

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311124

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310454

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310795

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310825

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311129

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311282

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310966

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310967

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310427

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

Reference Method: SM 2120 B
Batch ID: P310423

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310504

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P311039

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P311040

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310852

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310853

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310506

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P310904

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: P310571

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310571

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Beryllium	100		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	95.4		P	85 - 115
Copper	99.0		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	101		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311121

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310454

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: P310795

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310825

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311129

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311282

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310966

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	90.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.2		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P310504

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

Reference Method: SM 4500 F-C-97
Batch ID: P310506

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310904

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826926	Calcium	103		P	80 - 120
1826926	Iron	104		P	80 - 120
1826926	Magnesium	104		P	80 - 120
1826926	Potassium	106		P	80 - 120
1826926	Sodium	102		P	80 - 120
1826926	Zinc	101		P	80 - 120
1827320	Calcium	109	106	P/P	80 - 120
1827320	Iron	107	105	P/P	80 - 120
1827320	Magnesium	109	107	P/P	80 - 120
1827320	Potassium	102	102	P/P	80 - 120
1827320	Sodium	105		P	80 - 120
1827320	Zinc	107	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826926	Arsenic	100		P	80 - 120
1826926	Beryllium	103		P	80 - 120
1826926	Cadmium	100		P	80 - 120
1826926	Chromium	96.5		P	80 - 120
1826926	Copper	99.9		P	80 - 120
1826926	Lead	101		P	80 - 120
1826926	Nickel	101		P	80 - 120
1826926	Silver	102		P	80 - 120
1827320	Arsenic	98.9	99.9	P/P	80 - 120
1827320	Beryllium	101	99.2	P/P	80 - 120
1827320	Cadmium	101	102	P/P	80 - 120
1827320	Chromium	95.6	98.2	P/P	80 - 120
1827320	Copper	96.7	97.0	P/P	80 - 120
1827320	Lead	102	103	P/P	80 - 120
1827320	Nickel	96.3	98.5	P/P	80 - 120
1827320	Silver	101	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827339	Chloride	101		P	90 - 110
1827360	Chloride	98.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827339	Sulfate	100		P	90 - 110
1827360	Sulfate	100		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827080	Kjeldahl Nitrogen	97.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826796	NO2NO3-N	90.4	93.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311129

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829200	NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829508	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827075	Total-P	97.1	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827354	Total-P	96.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827317	O-Phosphate-P	98.0	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P310506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827360	Fluoride	97.4	97.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827070	Organic Carbon	107		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827293	Turbidity	3.72	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827320	Calcium	2.08	Spike	P	0 - 20
1827320	Iron	1.77	Spike	P	0 - 20
1827320	Magnesium	1.67	Spike	P	0 - 20
1827320	Potassium	0.112	Spike	P	0 - 20
1827320	Sodium	1.05	Spike	P	0 - 20
1827320	Zinc	3.14	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827320	Arsenic	1.00	Spike	P	0 - 20
1827320	Beryllium	2.07	Spike	P	0 - 20
1827320	Cadmium	1.40	Spike	P	0 - 20
1827320	Chromium	2.65	Spike	P	0 - 20
1827320	Copper	0.257	Spike	P	0 - 20
1827320	Lead	0.945	Spike	P	0 - 20
1827320	Nickel	2.21	Spike	P	0 - 20
1827320	Silver	1.56	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827339	Chloride	0.672	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827339	Sulfate	5.06	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826976	Ammonia-N	0.483	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827080	Kjeldahl Nitrogen	2.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826796	NO2NO3-N	2.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829200	NO2NO3-N	0.495	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829508	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827075	Total-P	4.83	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827354	Total-P	4.36	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827317	O-Phosphate-P	1.22	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827293	Color (true)	3.41	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P310504

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827360	Total Alkalinity	0.203	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827293	TDS	3.20	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P311040

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827294	TDS	4.74	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P310852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827293	TSS	9.23	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P310853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827294	TSS	8.00	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827360	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827070	Organic Carbon	0.911	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: A71351

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

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

Reference Method: SM 2120 B

Run ID: A71352

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	92.0	92.1	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A71353

Included Lab Sample IDs: 1827297, 1827298, 1827303, 1827304

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A71364

Included Lab Sample IDs: 1827295, 1827296, 1827301, 1827302

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

Reference Method: SM 2320 B-97

Run ID: A71389

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

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: A71389

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110
Fluoride	99.0	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71474

Included Lab Sample IDs: 1827309, 1827310

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71490

Included Lab Sample IDs: 1827301, 1827302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71501

Included Lab Sample IDs: 1827309, 1827310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.7	98.1	P/P	90 - 110
Beryllium	98.2	97.5	P/P	90 - 110
Cadmium	98.9	98.1	P/P	90 - 110
Chromium	95.3	95.7	P/P	90 - 110
Copper	97.5	95.0	P/P	90 - 110
Lead	97.4	97.1	P/P	90 - 110
Nickel	98.6	96.0	P/P	90 - 110
Silver	100	99.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A71508

Included Lab Sample IDs: 1827295, 1827296, 1827301, 1827302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71564

Included Lab Sample IDs: 1827295, 1827296, 1827301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	103	P/P	90 - 110
Total-P	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71567

Included Lab Sample IDs: 1827295, 1827296, 1827301, 1827302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	93.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71574

Included Lab Sample IDs: 1827302

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71576

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71576

Included Lab Sample IDs: 1827293, 1827294, 1827299, 1827300

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	99.1	101	P/P	90 - 110
Sulfate	99.7	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71609

Included Lab Sample IDs: 1827295

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71651

Included Lab Sample IDs: 1827296

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery				LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity							3.72	
EPA 200.7 Rev. 4.4	Calcium	103	103	109	106				2.08
	Iron	103	104	107	105				1.77
	Magnesium	103	104	109	107				1.67
	Potassium	102	106	102	102				0.112
	Sodium	103	102	105					1.05
	Zinc	104	101	107	104				3.14
EPA 200.8 Rev. 5.4	Arsenic	102	100	98.9	99.9				1.00
	Beryllium	100	103	101	99.2				2.07
	Cadmium	99.2	100	101	102				1.40
	Chromium	95.4	96.5	95.6	98.2				2.65
	Copper	99.0	99.9	96.7	97.0				0.257
	Lead	98.7	101	102	103				0.945
	Nickel	101	101	96.3	98.5				2.21
	Silver	100	102	101	102				1.56
EPA 300.0 Rev. 2.1	Chloride	101	101	98.6				0.672	
	Sulfate	99.6	100	100				5.06	
EPA 350.1 Rev. 2.0	Ammonia-N	102							0.483
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	97.4	101					2.03
EPA 353.2 Rev. 2.0	NO2NO3-N	100	90.4	93.0					2.01
	NO2NO3-N	104	96.5						0.495
	NO2NO3-N	108	103	103					0.0
EPA 365.1 Rev. 2.0	Total-P	99.5	97.1	102					4.83

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 365.1 Rev. 2.0	Total-P	90.2	96.0	100		4.36
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	98.0	99.2		1.22
SM 2120 B	Color (true)				3.41	
SM 2320 B-97	Total Alkalinity	104			0.203	
SM 2540 C-97	TDS				3.20	
	TDS				4.74	
SM 2540 D-97	TSS				9.23	
	TSS				8.00	
SM 4500 F-C-97	Fluoride	96.7	97.4	97.4		0.0
SM 5310 B-00	Organic Carbon	105	107			0.911

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1827293, 1827294, 1827299, 1827300
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1827309, 1827310
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1827309, 1827310
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1827293, 1827294, 1827299, 1827300
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1827293, 1827294, 1827299, 1827300
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1827295, 1827296, 1827301, 1827302
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1827295, 1827296, 1827301, 1827302
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1827295, 1827296, 1827301, 1827302
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1827295, 1827296, 1827301, 1827302
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1827297, 1827298, 1827303, 1827304
SM 2120 B / E31780	True Color measured at 450 nm	1827293, 1827294, 1827299, 1827300
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1827293, 1827294, 1827299, 1827300
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1827293, 1827294, 1827299, 1827300
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1827293, 1827294, 1827299, 1827300
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1827293, 1827294, 1827299, 1827300
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1827295, 1827296, 1827301, 1827302

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	08/26/2016			08/26/2016 15:08	Sima Feizi	1827293, 1827294, 1827299, 1827300
EPA 200.7 Rev. 4.4	08/26/2016	08/30/2016	Elliott D. Healy	09/07/2016	Joshua Ayres	1827309, 1827310
EPA 200.8 Rev. 5.4	08/26/2016	08/30/2016	Elliott D. Healy	09/08/2016	Charles J. Peterson	1827309, 1827310
EPA 300.0 Rev. 2.1	08/26/2016			09/14/2016	Ping Hua	1827293, 1827294, 1827299, 1827300
EPA 350.1 Rev. 2.0	08/26/2016			08/26/2016	Julie Michelle Frank	1827295, 1827296, 1827301, 1827302
EPA 351.2 Rev. 2.0	08/26/2016	09/08/2016	Adrian Shelby	09/10/2016	Virginia P. Brown	1827295, 1827296, 1827301, 1827302
EPA 353.2 Rev. 2.0	08/26/2016			09/08/2016	Beverly Y. Sanders	1827301, 1827302
	08/26/2016			09/14/2016	Beverly Y. Sanders	1827295
	08/26/2016			09/15/2016	Peter D. Kaus	1827296
EPA 365.1 Rev. 2.0	08/26/2016	09/12/2016	Vijayalakshmi Reddy	09/13/2016	Lipi Saha	1827295, 1827296, 1827301, 1827302
EPA 365.1 Rev. 2.0 dissolved	08/26/2016			08/26/2016 16:43	Julia Storbeck	1827297
	08/26/2016			08/26/2016 16:44	Julia Storbeck	1827298, 1827303
	08/26/2016			08/26/2016 16:45	Julia Storbeck	1827304
SM 2120 B	08/26/2016			08/26/2016 14:34	Blanca Fach	1827293, 1827294
	08/26/2016			08/26/2016 14:35	Blanca Fach	1827300
	08/26/2016			08/26/2016 14:41	Blanca Fach	1827299
SM 2320 B-97	08/26/2016			08/29/2016	Dale L. Simmons	1827293, 1827294, 1827299, 1827300
SM 2540 C-97	08/26/2016			08/31/2016	Yijie Li	1827293, 1827294, 1827299, 1827300
SM 2540 D-97	08/26/2016			08/31/2016	Yijie Li	1827293, 1827294, 1827299, 1827300
SM 4500 F-C-97	08/26/2016			08/29/2016	Dale L. Simmons	1827293, 1827294, 1827299, 1827300
SM 5310 B-00	08/26/2016			09/09/2016	Sofia Elnemr	1827295, 1827296, 1827301, 1827302