Chemical Analysis Report

SE-DIST-2016-06-16-01

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

Event Description: **SMP-Glades Run**
Request ID: **RQ-2016-06-13-35**
Customer: **SE-DIST**
Project ID: **SMP**

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

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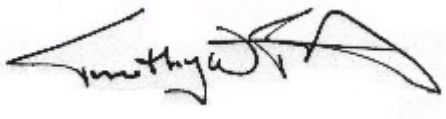
Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 12-JUL-2016 15:20



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: WCA3L-67@ S-151 **Collection Date/Time: 06/15/2016 11:40**

Field ID: G5SE0041 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808812	EPA 180.1 Rev. 2.0	Turbidity	1.1	A	NTU	P306453	
	EPA 300.0 Rev. 2.1	Chloride	71		mg Cl/L	P306879	
		Sulfate	21		mg SO4/L	P306881	
	SM 2120 B	Color (true)	100	A	PCU	P306396	
	SM 2320 B-97	Total Alkalinity	165		mg CaCO3/L	P306821	
	SM 2540 C-97	TDS	356	A	mg/L	P307024	
	SM 2540 D-97	TSS	3	I	mg/L	P306964	
	SM 4500 F-C-97	Fluoride	0.36		mg F/L	P307272	MS
1808817	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P306688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P306416	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P306586	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P306542	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P306883	
1808822	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P306336	
1808832	EPA 200.7 Rev. 4.4	Calcium	55.2		mg/L	P306469	
		Iron	52	I	ug/L	P306469	
		Magnesium	15.4		mg/L	P306469	
		Potassium	5.1		mg/L	P306469	
		Sodium	45.2		mg/L	P306469	
		Zinc	5.0	U	ug/L	P306469	
	EPA 200.8 Rev. 5.4	Arsenic	1.40		ug/L	P306469	
		Cadmium	0.020	U	ug/L	P306469	
		Chromium	0.073	I	ug/L	P306469	
		Copper	0.10	U	ug/L	P306469	
		Lead	0.057	I	ug/L	P306469	
		Nickel	0.25	U	ug/L	P306469	
		Silver	0.0050	U	ug/L	P306469	

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: WCA2B@ S-141 **Collection Date/Time: 06/15/2016 12:15**

Field ID: G5SE0040 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808813	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P306453	
	EPA 300.0 Rev. 2.1	Chloride	87		mg Cl/L	P306879	
		Sulfate	31		mg SO4/L	P306881	
	SM 2120 B	Color (true)	110		PCU	P306396	
	SM 2320 B-97	Total Alkalinity	178		mg CaCO3/L	P306821	
	SM 2540 C-97	TDS	410		mg/L	P307024	
	SM 2540 D-97	TSS	2	I	mg/L	P306964	
	SM 4500 F-C-97	Fluoride	0.46		mg F/L	P307272	MS
1808818	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P306688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P306417	

Field ID: G5SE0040 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808818	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P306586	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P306542	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P306883	
1808823	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P306336	
1808833	EPA 200.7 Rev. 4.4	Calcium	60.7		mg/L	P306469	
		Iron	30	U	ug/L	P306469	
		Magnesium	19.0		mg/L	P306469	
		Potassium	6.3		mg/L	P306469	
		Sodium	56.7		mg/L	P306469	
		Zinc	5.0	U	ug/L	P306469	
	EPA 200.8 Rev. 5.4	Arsenic	1.78		ug/L	P306469	
		Cadmium	0.020	U	ug/L	P306469	
		Chromium	0.067	I	ug/L	P306469	
		Copper	0.10	U	ug/L	P306469	
		Lead	0.050	U	ug/L	P306469	
		Nickel	0.25	U	ug/L	P306469	
		Silver	0.0075	I	ug/L	P306469	

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: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: WCA1-L-7 NE of S6 Structure **Collection Date/Time: 06/15/2016 13:10**

Field ID: G5SE0018 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808814	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P306453	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P306879	
		Sulfate	52		mg SO4/L	P306881	
	SM 2120 B	Color (true)	110		PCU	P306396	
	SM 2320 B-97	Total Alkalinity	176		mg CaCO3/L	P306821	
	SM 2540 C-97	TDS	503		mg/L	P307024	
	SM 2540 D-97	TSS	3	I	mg/L	P306964	
	SM 4500 F-C-97	Fluoride	0.39		mg F/L	P307272	MS
1808819	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P306688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P306417	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P306586	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P306718	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P306883	
1808824	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P306336	
1808834	EPA 200.7 Rev. 4.4	Calcium	62.8		mg/L	P306469	
		Iron	30	U	ug/L	P306469	
		Magnesium	19.5		mg/L	P306469	
		Potassium	7.3		mg/L	P306469	
		Sodium	79.4		mg/L	P306469	
		Zinc	5.0	U	ug/L	P306469	

Field ID: G5SE0018 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808834	EPA 200.8 Rev. 5.4	Arsenic	1.69		ug/L	P306469	
		Cadmium	0.020	U	ug/L	P306469	
		Chromium	0.15	I	ug/L	P306469	
		Copper	0.20	I	ug/L	P306469	
		Lead	0.050	U	ug/L	P306469	
		Nickel	0.25	U	ug/L	P306469	
		Silver	0.012	I	ug/L	P306469	

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: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: WCA1L39 Canal **Collection Date/Time: 06/15/2016 13:20**

Field ID: G5SE0019 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808815	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P306453	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P306879	
		Sulfate	51		mg SO4/L	P306881	
	SM 2120 B	Color (true)	110		PCU	P306396	
	SM 2320 B-97	Total Alkalinity	174		mg CaCO3/L	P306821	
	SM 2540 C-97	TDS	467		mg/L	P307024	
	SM 2540 D-97	TSS	9	I	mg/L	P306964	
	SM 4500 F-C-97	Fluoride	0.39		mg F/L	P307272	MS
1808820	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P306688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P306417	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.026		mg N/L	P306586	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P306542	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P306883	
1808825	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P306336	
1808835	EPA 200.7 Rev. 4.4	Calcium	62.1		mg/L	P306469	
		Iron	51	I	ug/L	P306469	
		Magnesium	18.9		mg/L	P306469	
		Potassium	7.1		mg/L	P306469	
		Sodium	76.9		mg/L	P306469	
		Zinc	5.0	U	ug/L	P306469	
	EPA 200.8 Rev. 5.4	Arsenic	1.70		ug/L	P306469	
		Cadmium	0.020	U	ug/L	P306469	
		Chromium	0.21		ug/L	P306469	
		Copper	0.35	I	ug/L	P306469	
		Lead	0.088	I	ug/L	P306469	
		Nickel	0.33	I	ug/L	P306469	
		Silver	0.011	I	ug/L	P306469	

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: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: WCA1-L-7 NE of S6 Structure **Collection Date/Time: 06/15/2016 13:40**

Field ID: G5SE0018_Duplicate Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1808816	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P306453	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P306879	
		Sulfate	52		mg SO4/L	P306881	
	SM 2120 B	Color (true)	110		PCU	P306396	
	SM 2320 B-97	Total Alkalinity	177		mg CaCO3/L	P306821	
	SM 2540 C-97	TDS	502		mg/L	P307024	
	SM 2540 D-97	TSS	3	I	mg/L	P306964	
	SM 4500 F-C-97	Fluoride	0.39		mg F/L	P307272	MS
1808821	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P306688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P306417	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P306587	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P306542	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P306883	
1808826	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P306336	
1808836	EPA 200.7 Rev. 4.4	Calcium	62.1		mg/L	P306469	
		Iron	30	U	ug/L	P306469	
		Magnesium	19.4		mg/L	P306469	
		Potassium	7.2		mg/L	P306469	
		Sodium	77.9		mg/L	P306469	
		Zinc	5.0	U	ug/L	P306469	
	EPA 200.8 Rev. 5.4	Arsenic	1.71		ug/L	P306469	
		Cadmium	0.020	U	ug/L	P306469	
		Chromium	0.13	I	ug/L	P306469	
		Copper	0.11	I	ug/L	P306469	
		Lead	0.050	U	ug/L	P306469	
		Nickel	0.25	U	ug/L	P306469	
		Silver	0.011	I	ug/L	P306469	

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: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306453

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306469

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306469

Component	Result	Code	Units
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306469

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	0.25	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306879

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306881

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306688

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306416

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306417

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306586

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306587

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306542

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306718

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306336

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

Reference Method: SM 2120 B
Batch ID: P306396

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P306821

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

Reference Method: SM 2540 C-97
Batch ID: P307024

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P306964

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307272

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P306883

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: P306469

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	103		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	99.6		P	85 - 115
Sodium	103		P	85 - 115
Zinc	98.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306469

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.8		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	98.8		P	85 - 115
Copper	97.9		P	85 - 115
Lead	100		P	85 - 115
Nickel	103		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306879

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306881

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306688

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306416

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306417

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306586

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306542

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306718

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306336

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

Reference Method: SM 2320 B-97
Batch ID: P306821

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

Reference Method: SM 4500 F-C-97
Batch ID: P307272

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P306883

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808522	Calcium	101		P	80 - 120
1808522	Iron	104	103	P/P	80 - 120
1808522	Magnesium	106	106	P/P	80 - 120
1808522	Potassium	101	101	P/P	80 - 120
1808522	Sodium	103	104	P/P	80 - 120
1808522	Zinc	99.1	99.8	P/P	80 - 120
1809060	Calcium	104		P	80 - 120
1809060	Iron	104		P	80 - 120
1809060	Magnesium	106		P	80 - 120
1809060	Potassium	106		P	80 - 120
1809060	Sodium	103		P	80 - 120
1809060	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808522	Arsenic	99.4	98.3	P/P	80 - 120
1808522	Cadmium	103	104	P/P	80 - 120
1808522	Chromium	98.7	99.2	P/P	80 - 120
1808522	Copper	94.1	94.0	P/P	80 - 120
1808522	Lead	100	99.3	P/P	80 - 120
1808522	Nickel	99.4	98.7	P/P	80 - 120
1808522	Silver	99.6	100	P/P	80 - 120
1809060	Arsenic	103		P	80 - 120
1809060	Cadmium	106		P	80 - 120
1809060	Chromium	103		P	80 - 120
1809060	Copper	96.8		P	80 - 120
1809060	Lead	103		P	80 - 120
1809060	Nickel	101		P	80 - 120
1809060	Silver	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808950	Chloride	103		P	90 - 110
1809000	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808950	Sulfate	102		P	90 - 110
1809000	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306688

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808804	Ammonia-N	95.5	97.7	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808805	Kjeldahl Nitrogen	98.7	92.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808754	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808821	NO2NO3-N	96.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808753	Total-P	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1809499	Total-P	98.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808759	O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P307272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1809401	Fluoride	105	106	F/F	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P306883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1808817	Organic Carbon	97.0		P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808812	Turbidity	13.3	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808522	Calcium	1.59	Spike	P	0 - 20
1808522	Iron	0.376	Spike	P	0 - 20
1808522	Magnesium	0.158	Spike	P	0 - 20
1808522	Potassium	0.150	Spike	P	0 - 20
1808522	Sodium	0.278	Spike	P	0 - 20
1808522	Zinc	0.716	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808522	Arsenic	1.07	Spike	P	0 - 20
1808522	Cadmium	1.48	Spike	P	0 - 20
1808522	Chromium	0.422	Spike	P	0 - 20
1808522	Copper	0.0975	Spike	P	0 - 20
1808522	Lead	0.736	Spike	P	0 - 20
1808522	Nickel	0.714	Spike	P	0 - 20
1808522	Silver	0.531	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808950	Chloride	0.0794	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P306881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808950	Sulfate	2.57	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808804	Ammonia-N	2.12	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808805	Kjeldahl Nitrogen	3.63	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808818	Kjeldahl Nitrogen	0.354	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808754	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808821	NO2NO3-N	1.35	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808753	Total-P	0.386	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1809499	Total-P	1.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808759	O-Phosphate-P	0.484	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P306396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808812	Color (true)	0.639	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P306821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808497	Total Alkalinity	0.0437	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P307024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808812	TDS	0.281	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P307272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1809401	Fluoride	0.484	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P306883

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1808817	Organic Carbon	0.0949	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70081
Included Lab Sample IDs: 1808822, 1808823, 1808824, 1808825, 1808826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	97.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70102
Included Lab Sample IDs: 1808812, 1808813, 1808814, 1808815, 1808816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70118
Included Lab Sample IDs: 1808812, 1808813, 1808814, 1808815, 1808816

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70150
Included Lab Sample IDs: 1808817, 1808818, 1808819, 1808820, 1808821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	96.5	P/P	90 - 110
NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A70156
Included Lab Sample IDs: 1808817, 1808818, 1808819, 1808820, 1808821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.2	100	P/P	90 - 110
Kjeldahl Nitrogen	98.5	98.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A70161
Included Lab Sample IDs: 1808832, 1808833, 1808834, 1808835, 1808836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	100	101	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	99.5	100	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A70166
Included Lab Sample IDs: 1808817, 1808818, 1808820, 1808821

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A70173
Included Lab Sample IDs: 1808817, 1808818, 1808819, 1808820, 1808821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	98.8	P/P	90 - 110
Ammonia-N	98.8	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A70212
Included Lab Sample IDs: 1808819

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A70215
Included Lab Sample IDs: 1808812, 1808813, 1808814, 1808815, 1808816

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A70233
Included Lab Sample IDs: 1808812, 1808813, 1808814, 1808815, 1808816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	98.9	P/P	90 - 110
Chloride	99.0	100	P/P	90 - 110
Sulfate	96.4	99.9	P/P	90 - 110
Sulfate	99.9	95.4	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A70234
Included Lab Sample IDs: 1808817, 1808818, 1808819, 1808820, 1808821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	94.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70238
Included Lab Sample IDs: 1808832, 1808833, 1808834, 1808835, 1808836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.6	97.6	P/P	90 - 110
Cadmium	100	100	P/P	90 - 110
Chromium	100	102	P/P	90 - 110
Copper	97.7	96.6	P/P	90 - 110
Lead	98.5	98.2	P/P	90 - 110
Silver	98.4	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70289
Included Lab Sample IDs: 1808832, 1808833, 1808834, 1808835, 1808836

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70295
Included Lab Sample IDs: 1808833, 1808834, 1808835, 1808836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.7	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A70370
Included Lab Sample IDs: 1808812, 1808813, 1808814, 1808815, 1808816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.6	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						13.3	
EPA 200.7 Rev. 4.4	Calcium	101	101	104				1.59
	Iron	103	104	103	104			0.376
	Magnesium	108	106	106	106			0.158
	Potassium	99.6	101	101	106			0.150
	Sodium	103	103	104	103			0.278
	Zinc	98.2	99.1	99.8	102			0.716
EPA 200.8 Rev. 5.4	Arsenic	98.8	99.4	98.3	103			1.07
	Cadmium	99.2	103	104	106			1.48
	Chromium	98.8	98.7	99.2	103			0.422
	Copper	97.9	94.1	94.0	96.8			0.0975
	Lead	100	100	99.3	103			0.736
	Nickel	103	99.4	98.7	101			0.714
	Silver	100	99.6	100	101			0.531
EPA 300.0 Rev. 2.1	Chloride	102	103	102			0.0794	
	Sulfate	101	102	103			2.57	
EPA 350.1 Rev. 2.0	Ammonia-N	96.2	95.5	97.7				2.12
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.7	92.8				3.63
	Kjeldahl Nitrogen	100						0.354
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.0	99.0				0.0
	NO2NO3-N	98.5	96.5	98.0				1.35
EPA 365.1 Rev. 2.0	Total-P	98.9	100	100				0.386
	Total-P	100	98.5	100				1.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.4	98.9				0.484
SM 2120 B	Color (true)						0.639	
SM 2320 B-97	Total Alkalinity	103					0.0437	
SM 2540 C-97	TDS						0.281	
SM 4500 F-C-97	Fluoride	97.7	105	106				0.484
SM 5310 B-00	Organic Carbon	94.4	97.0					0.0949

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1808812, 1808813, 1808814, 1808815, 1808816
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1808832, 1808833, 1808834, 1808835, 1808836
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1808832, 1808833, 1808834, 1808835, 1808836
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1808812, 1808813, 1808814, 1808815, 1808816
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1808812, 1808813, 1808814, 1808815, 1808816
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1808817, 1808818, 1808819, 1808820, 1808821
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1808817, 1808818, 1808819, 1808820, 1808821
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1808817, 1808818, 1808819, 1808820, 1808821
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1808817, 1808818, 1808819, 1808820, 1808821
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1808822, 1808823, 1808824, 1808825, 1808826
SM 2120 B / E31780	True Color measured at 450 nm	1808812, 1808813, 1808814, 1808815, 1808816

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1808812, 1808813, 1808814, 1808815, 1808816
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1808812, 1808813, 1808814, 1808815, 1808816
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1808812, 1808813, 1808814, 1808815, 1808816
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1808812, 1808813, 1808814, 1808815, 1808816
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1808817, 1808818, 1808819, 1808820, 1808821

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	06/16/2016			06/16/2016 16:07	Rochelle Y Jackson	1808812, 1808813, 1808814, 1808815, 1808816
EPA 200.7 Rev. 4.4	06/16/2016	06/20/2016	Elliott D. Healy	06/21/2016	Joshua Ayres	1808832, 1808833, 1808834, 1808835, 1808836
EPA 200.8 Rev. 5.4	06/16/2016	06/20/2016	Elliott D. Healy	06/24/2016	Charles J. Peterson	1808832, 1808833, 1808834, 1808835, 1808836
	06/16/2016	06/20/2016	Elliott D. Healy	06/28/2016	Charles J. Peterson	1808833, 1808834, 1808835, 1808836
	06/16/2016	06/20/2016	Elliott D. Healy	06/28/2016	Robert K Palmer	1808832, 1808833, 1808834, 1808835, 1808836
EPA 300.0 Rev. 2.1	06/16/2016			06/24/2016	Julia Storbeck	1808812, 1808813, 1808814, 1808815, 1808816
EPA 350.1 Rev. 2.0	06/16/2016			06/22/2016	Diana M. Turner	1808817, 1808818, 1808819, 1808820, 1808821
EPA 351.2 Rev. 2.0	06/16/2016	06/20/2016	Sofia Elnemr	06/22/2016	Christopher Armour	1808817, 1808818, 1808819, 1808820, 1808821
EPA 353.2 Rev. 2.0	06/16/2016			06/21/2016	Beverly Y. Sanders	1808817, 1808818, 1808819, 1808820, 1808821
EPA 365.1 Rev. 2.0	06/16/2016	06/21/2016	Vijayalakshmi Reddy	06/22/2016	Lipi Saha	1808817, 1808818, 1808820, 1808821
	06/16/2016	06/23/2016	Vijayalakshmi Reddy	06/24/2016	Lipi Saha	1808819
EPA 365.1 Rev. 2.0 dissolved	06/16/2016			06/16/2016 12:35	Virginia P. Brown	1808822
	06/16/2016			06/16/2016 12:36	Virginia P. Brown	1808823
	06/16/2016			06/16/2016 12:37	Virginia P. Brown	1808824
	06/16/2016			06/16/2016 12:38	Virginia P. Brown	1808825
	06/16/2016			06/16/2016 12:39	Virginia P. Brown	1808826
SM 2120 B	06/16/2016			06/16/2016 15:33	Chrisoulla Rakowski	1808812
	06/16/2016			06/16/2016 15:34	Chrisoulla Rakowski	1808813, 1808814
	06/16/2016			06/16/2016 15:35	Chrisoulla Rakowski	1808815
	06/16/2016			06/16/2016 15:36	Chrisoulla Rakowski	1808816
SM 2320 B-97	06/16/2016			06/22/2016	Rochelle Y Jackson	1808812, 1808813, 1808814, 1808815
	06/16/2016			06/23/2016	Rochelle Y Jackson	1808816
SM 2540 C-97	06/16/2016			06/20/2016	Sima Feizi	1808812, 1808813, 1808814, 1808815, 1808816
SM 2540 D-97	06/16/2016			06/20/2016	Sima Feizi	1808812, 1808813, 1808814, 1808815, 1808816
SM 4500 F-C-97	06/16/2016			07/01/2016	Dale L. Simmons	1808812, 1808813, 1808814, 1808815, 1808816
SM 5310 B-00	06/16/2016			06/24/2016	Diana M. Turner	1808817, 1808818, 1808819, 1808820, 1808821