

Chemical Analysis Report

SO-DIST-2016-05-10-01

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

Event Description: **SMP: Florida Keys**
Request ID: **RQ-2016-05-09-12**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 07-JUN-2016 14:29

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: FIELD BLANK

Collection Date/Time: 05/09/2016 14:10

Field ID: G5SD-Blank1

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797089	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P303970	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P304482	
	SM 2540 D-97	TSS	2	U	mg/L	P304397	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P304484	
1797094	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P304312	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P304628	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P304522	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P305050	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P304876	
1797099	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303964	
1797109	EPA 200.7 Rev. 4.4	Iron	30	U	ug/L	P304370	
		Zinc	5.0	U	ug/L	P304370	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P304370	
		Cadmium	0.020	U	ug/L	P304370	
		Chromium	0.050	U	ug/L	P304370	
		Copper	0.10	U	ug/L	P304370	
		Lead	0.050	U	ug/L	P304370	
		Nickel	0.050	U	ug/L	P304370	
		Silver	0.0050	U	ug/L	P304370	

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: INDIAN KEY FILL AT SW END

Collection Date/Time: 05/09/2016 13:55

Field ID: G5SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797090	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P303970	
	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P304243	
	SM 2540 D-97	TSS	3	I	mg/L	P304398	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P304245	
1797095	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P304307	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P304503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P304426	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P304765	
	SM 5310 B-00	Organic Carbon	1.7	I	mg C/L	P304876	
1797100	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303964	
1797110	EPA 200.7 Rev. 4.4	Iron	150	U	ug/L	P304370	
		Zinc	25	U	ug/L	P304370	
	EPA 200.8 Rev. 5.4	Arsenic	2.0		ug/L	P304370	
		Cadmium	0.10	U	ug/L	P304370	
		Chromium	0.25	U	ug/L	P304370	
		Copper	0.30	U	ug/L	P304370	
		Lead	0.25	U	ug/L	P304370	
		Nickel	0.15	U	ug/L	P304370	

Field ID: G5SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797110	EPA 200.8 Rev. 5.4	Silver	0.025	U	ug/L	P304370	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 05/13/2016.

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

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 06/03/2016.

Sample Location: GRASSY KEY @ CURRY HAMMOCK SP CREEK Collection Date/Time: 05/09/2016 15:40

Field ID: FLKEYS0022FTM

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797091	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P303970	
	SM 2320 B-97	Total Alkalinity	131		mg CaCO3/L	P304243	
	SM 2540 D-97	TSS	3	U	mg/L	P304398	
	SM 4500 F-C-97	Fluoride	1.4		mg F/L	P304245	
1797096	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P304307	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38	I	mg N/L	P304503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P304431	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P304765	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P304876	
1797101	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303964	
1797111	EPA 200.7 Rev. 4.4	Iron	150	U	ug/L	P304370	
		Zinc	25	U	ug/L	P304370	
	EPA 200.8 Rev. 5.4	Arsenic	2.1		ug/L	P304370	
		Cadmium	0.10	U	ug/L	P304370	
		Chromium	0.25	U	ug/L	P304370	
		Copper	0.30	U	ug/L	P304370	
		Lead	0.25	U	ug/L	P304370	
		Nickel	0.15	U	ug/L	P304370	
		Silver	0.025	U	ug/L	P304370	

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: INDIAN KEY FILL AT SW END dupl

Collection Date/Time: 05/09/2016 14:00

Field ID: G5SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797092	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P303970	
	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P304243	
	SM 2540 D-97	TSS	4	I	mg/L	P304398	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P304245	
1797097	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P304307	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.16	U	mg N/L	P304503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P304426	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P304765	
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P304876	
1797102	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303964	

Field ID: G5SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797112	EPA 200.7 Rev. 4.4	Iron	150	U	ug/L	P304370	
		Zinc	25	U	ug/L	P304370	
	EPA 200.8 Rev. 5.4	Arsenic	2.0		ug/L	P304370	
		Cadmium	0.10	U	ug/L	P304370	
		Chromium	0.25	U	ug/L	P304370	
		Copper	0.32	I	ug/L	P304370	
		Lead	0.25	U	ug/L	P304370	
		Nickel	0.15	U	ug/L	P304370	
		Silver	0.025	U	ug/L	P304370	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 05/13/2016.

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

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 06/03/2016.

Sample Location: 6012C BY BRIDGE NO NAME KEY

Collection Date/Time: 05/09/2016 16:40

Field ID: G5SD0071

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1797093	EPA 180.1 Rev. 2.0	Turbidity	1.1	A	NTU	P303971	
	SM 2320 B-97	Total Alkalinity	115	A	mg CaCO3/L	P304243	
	SM 2540 D-97	TSS	4	I	mg/L	P304398	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P304245	
1797098	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P304307	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23	I	mg N/L	P304503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P304426	
	EPA 365.1 Rev. 2.0	Total-P	0.010		mg P/L	P304765	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P304876	
1797103	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303964	
1797113	EPA 200.7 Rev. 4.4	Iron	150	U	ug/L	P304370	
		Zinc	25	U	ug/L	P304370	
	EPA 200.8 Rev. 5.4	Arsenic	1.5		ug/L	P304370	
		Cadmium	0.10	U	ug/L	P304370	
		Chromium	0.25	U	ug/L	P304370	
		Copper	0.30	U	ug/L	P304370	
		Lead	0.25	U	ug/L	P304370	
		Nickel	0.15	U	ug/L	P304370	
		Silver	0.025	U	ug/L	P304370	

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: P303970

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303971

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304370

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304370

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 350.1 Rev. 2.0
Batch ID: P304307

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304312

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304628

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304426

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: P304431

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304522

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304765

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305050

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303964

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

Reference Method: SM 2320 B-97
Batch ID: P304243

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

Reference Method: SM 2320 B-97
Batch ID: P304482

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

Reference Method: SM 2540 D-97
Batch ID: P304397

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P304398

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P304245

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P304484

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P304876

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: P304370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115
Zinc	99.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.5		P	85 - 115
Cadmium	97.7		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	92.5		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	95.2		P	85 - 115
Silver	92.1		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304307

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304312

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304628

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: P304426

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304431

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304522

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304765

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305050

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303964

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

Reference Method: SM 2320 B-97
Batch ID: P304243

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P304482

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

Reference Method: SM 4500 F-C-97
Batch ID: P304245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P304484

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P304876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797480	Iron	98.4	98.1	P/P	70 - 130
1797480	Zinc	98.9	96.8	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797480	Arsenic	94.3	94.0	P/P	70 - 130
1797480	Cadmium	81.6	85.0	P/P	70 - 130
1797480	Chromium	81.2	82.5	P/P	70 - 130
1797480	Copper	91.7	91.7	P/P	70 - 130
1797480	Lead	103	103	P/P	70 - 130
1797480	Nickel	97.4	99.0	P/P	70 - 130
1797480	Silver	81.4	79.0	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304307

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797096	Ammonia-N	101	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797026	Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304503

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795834	Kjeldahl Nitrogen	103	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304628

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797086	Kjeldahl Nitrogen	102	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795833	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304431

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795538	NO2NO3-N	97.5	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304522

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797160	NO2NO3-N	98.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304765

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1796684	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1798412	Total-P	98.6	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797100	O-Phosphate-P	99.8	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P304245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1797093	Fluoride	92.3	92.3	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P304484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1796790	Fluoride	99.8	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P304876

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795834	Organic Carbon	88.3	92.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797075	Turbidity	3.20	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797093	Turbidity	1.87	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P304370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797480	Iron	0.361	Spike	P	0 - 20
1797480	Zinc	2.18	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P304370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797480	Arsenic	0.377	Spike	P	0 - 20
1797480	Cadmium	4.08	Spike	P	0 - 20
1797480	Chromium	1.69	Spike	P	0 - 20
1797480	Copper	0.0968	Spike	P	0 - 20
1797480	Lead	0.128	Spike	P	0 - 20
1797480	Nickel	1.65	Spike	P	0 - 20
1797480	Silver	3.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304307

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797096	Ammonia-N	1.45	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797026	Ammonia-N	0.537	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795834	Kjeldahl Nitrogen	2.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304628

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797086	Kjeldahl Nitrogen	1.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795833	NO2NO3-N	0.435	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304431

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795538	NO2NO3-N	1.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797160	NO2NO3-N	1.52	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1796684	Total-P	1.72	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1798412	Total-P	1.91	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797100	O-Phosphate-P	0.997	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P304243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797093	Total Alkalinity	0.467	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P304482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1796790	Total Alkalinity	0.239	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P304245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1797093	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P304484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1796790	Fluoride	0.473	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P304876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795834	Organic Carbon	4.41	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 365.1 Rev. 2.0 dissolved

Run ID: A69389

Included Lab Sample IDs: 1797099, 1797100, 1797101, 1797102, 1797103

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	101	99.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A69393

Included Lab Sample IDs: 1797089, 1797090, 1797091, 1797092, 1797093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 2320 B-97

Run ID: A69463

Included Lab Sample IDs: 1797090, 1797091, 1797092, 1797093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.5	P/P	90 - 110
Total Alkalinity	99.5	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69463

Included Lab Sample IDs: 1797090, 1797091, 1797092, 1797093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.5	100	P/P	90 - 110
Fluoride	99.5	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69475

Included Lab Sample IDs: 1797094, 1797095, 1797096, 1797097, 1797098

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69515

Included Lab Sample IDs: 1797095, 1797096, 1797097, 1797098

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

Reference Method: SM 2320 B-97

Run ID: A69535

Included Lab Sample IDs: 1797089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.3	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A69535

Included Lab Sample IDs: 1797089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69550

Included Lab Sample IDs: 1797094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A69561

Included Lab Sample IDs: 1797109, 1797110, 1797111, 1797112, 1797113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	98.8	98.2	P/P	90 - 110
Iron	98.9	98.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A69568

Included Lab Sample IDs: 1797109, 1797110, 1797111, 1797112, 1797113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	99.7	100	P/P	90 - 110
Zinc	99.9	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69570

Included Lab Sample IDs: 1797109, 1797110, 1797111, 1797112, 1797113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.6	97.0	P/P	90 - 110
Arsenic	97.0	97.8	P/P	90 - 110
Cadmium	96.4	96.7	P/P	90 - 110
Cadmium	96.7	96.8	P/P	90 - 110
Chromium	97.5	97.6	P/P	90 - 110
Chromium	97.6	99.4	P/P	90 - 110
Copper	94.4	94.8	P/P	90 - 110
Copper	97.3	98.7	P/P	90 - 110
Lead	94.0	94.2	P/P	90 - 110
Lead	94.2	94.1	P/P	90 - 110
Nickel	94.8	95.2	P/P	90 - 110
Nickel	96.5	99.1	P/P	90 - 110
Silver	93.3	93.5	P/P	90 - 110
Silver	93.5	93.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69582

Included Lab Sample IDs: 1797095, 1797096, 1797097, 1797098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.3	94.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69612

Included Lab Sample IDs: 1797094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69651

Included Lab Sample IDs: 1797094, 1797095, 1797096, 1797097, 1797098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	92.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69663

Included Lab Sample IDs: 1797095, 1797096, 1797097, 1797098

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69725

Included Lab Sample IDs: 1797094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.8	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				3.20	
	Turbidity				1.87	
EPA 200.7 Rev. 4.4	Iron	104	98.4 98.1			0.361
	Zinc	99.9	98.9 96.8			2.18
EPA 200.8 Rev. 5.4	Arsenic	95.5	94.3 94.0			0.377
	Cadmium	97.7	81.6 85.0			4.08
	Chromium	97.3	81.2 82.5			1.69
	Copper	92.5	91.7 91.7			0.0968
	Lead	96.4	103 103			0.128
	Nickel	95.2	97.4 99.0			1.65
	Silver	92.1	81.4 79.0			3.07
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	101 103			1.45
	Ammonia-N	97.6	103 102			0.537
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	103 99.8			2.20
	Kjeldahl Nitrogen	101	102 100			1.73
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.0 99.5			0.435
	NO2NO3-N	102	97.5 98.5			1.02
	NO2NO3-N	102	98.0 100			1.52

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 365.1 Rev. 2.0	Total-P	100	104	102		1.72
	Total-P	101	98.6	101		1.91
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	99.8	101		0.997
SM 2320 B-97	Total Alkalinity	101			0.467	
	Total Alkalinity	101			0.239	
SM 4500 F-C-97	Fluoride	97.0	92.3	92.3		0.0
	Fluoride	98.8	99.8	99.0		0.473
SM 5310 B-00	Organic Carbon	99.2	88.3	92.8		4.41

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1797089, 1797090, 1797091, 1797092, 1797093
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1797109, 1797110, 1797111, 1797112, 1797113
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1797109, 1797110, 1797111, 1797112, 1797113
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1797094, 1797095, 1797096, 1797097, 1797098
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1797094, 1797095, 1797096, 1797097, 1797098
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1797094, 1797095, 1797096, 1797097, 1797098
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1797094, 1797095, 1797096, 1797097, 1797098
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1797099, 1797100, 1797101, 1797102, 1797103
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1797089, 1797090, 1797091, 1797092, 1797093
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1797089, 1797090, 1797091, 1797092, 1797093
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1797089, 1797090, 1797091, 1797092, 1797093
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1797094, 1797095, 1797096, 1797097, 1797098

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	05/10/2016			05/10/2016 15:26	Sima Feizi	1797089, 1797090, 1797091, 1797092, 1797093
EPA 200.7 Rev. 4.4	05/10/2016	05/16/2016	Elliott D. Healy	05/18/2016	Joshua Ayres	1797109, 1797110, 1797111, 1797112, 1797113
EPA 200.8 Rev. 5.4	05/10/2016	05/16/2016	Elliott D. Healy	05/18/2016	Charles J. Peterson	1797109
	05/10/2016	05/16/2016	Elliott D. Healy	05/19/2016	Charles J. Peterson	1797110, 1797111, 1797112, 1797113
EPA 350.1 Rev. 2.0	05/10/2016			05/13/2016	Diana M. Turner	1797094, 1797095, 1797096, 1797097, 1797098
EPA 351.2 Rev. 2.0	05/10/2016	05/18/2016	Sofia Elnemr	05/19/2016	Vijayalakshmi Reddy	1797095, 1797096, 1797097, 1797098
	05/10/2016	05/19/2016	Sofia Elnemr	05/23/2016	Christopher Armour	1797094
EPA 353.2 Rev. 2.0	05/10/2016			05/17/2016	Peter D. Kaus	1797095, 1797096, 1797097, 1797098
	05/10/2016			05/18/2016	Peter D. Kaus	1797094
EPA 365.1 Rev. 2.0	05/10/2016	05/23/2016	Vijayalakshmi Reddy	05/24/2016	Lipi Saha	1797095, 1797096, 1797097, 1797098
	05/10/2016	05/26/2016	Vijayalakshmi Reddy	05/26/2016	Rochelle Y Jackson	1797094
EPA 365.1 Rev. 2.0 dissolved	05/10/2016			05/10/2016 14:46	Julia Storbeck	1797100
	05/10/2016			05/10/2016 14:54	Julia Storbeck	1797099
	05/10/2016			05/10/2016 15:24	Julia Storbeck	1797101
	05/10/2016			05/10/2016 15:25	Julia Storbeck	1797102, 1797103
SM 2320 B-97	05/10/2016			05/13/2016	Dale L. Simmons	1797090, 1797091, 1797092, 1797093
	05/10/2016			05/18/2016	Dale L. Simmons	1797089
SM 2540 D-97	05/10/2016			05/11/2016	Yijie Li	1797089, 1797090, 1797091, 1797092, 1797093
SM 4500 F-C-97	05/10/2016			05/13/2016	Dale L. Simmons	1797090, 1797091, 1797092, 1797093
	05/10/2016			05/18/2016	Dale L. Simmons	1797089
SM 5310 B-00	05/10/2016			05/24/2016	Diana M. Turner	1797094, 1797095, 1797096, 1797097, 1797098