

Chemical Analysis Report

NE-DIST-2016-08-18-01

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

Event Description: **UEC South**
Request ID: **RQ-2016-08-15-21**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 08-SEP-2016 10:43

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

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: PALM COAST AT OLD KINGS RD.

Collection Date/Time: 08/17/2016 10:35

Field ID: G5NE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824622	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P310011	
	EPA 300.0 Rev. 2.1	Chloride	44		mg Cl/L	P310538	
		Sulfate	19		mg SO4/L	P310541	
	SM 2120 B	Color (true)	39	A	PCU	P309986	
	SM 2320 B-97	Total Alkalinity	164		mg CaCO3/L	P310234	
	SM 2540 C-97	TDS	308	A	mg/L	P310610	
	SM 2540 D-97	TSS	5	I	mg/L	P310500	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P310240	
1824624	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P310058	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0	J	mg N/L	P310079	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P310346	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P310035	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P310368	
1824626	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.060		mg P/L	P309982	

Ref. Method and Comment:

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

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

Sample Location: CRACKER AT CR 204

Collection Date/Time: 08/17/2016 09:30

Field ID: G5NE0079

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824623	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P310011	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P310538	
		Sulfate	37		mg SO4/L	P310541	
	SM 2120 B	Color (true)	38		PCU	P309986	
	SM 2320 B-97	Total Alkalinity	96		mg CaCO3/L	P310234	
	SM 2540 C-97	TDS	473		mg/L	P310610	
	SM 2540 D-97	TSS	2	U	mg/L	P310500	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P310240	
1824625	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P310058	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P310079	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P310346	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P310035	
	SM 5310 B-00	Organic Carbon	4.3		mg C/L	P310368	
1824627	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.16		mg P/L	P309982	

Ref. Method and Comment:

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

Sample Location: ICW AT ST. JOE WALKWAY

Collection Date/Time: 08/17/2016 11:50

Field ID: G5NE0016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824628	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P310010	
	SM 2320 B-97	Total Alkalinity	134		mg CaCO3/L	P310237	

Field ID: G5NE0016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824628	SM 2540 D-97	TSS	36		mg/L	P310503	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P310365	
1824630	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P310057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P310085	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P310238	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P309994	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P310369	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.046		mg P/L	P309981	
1824665	EPA 200.7 Rev. 4.4	Iron	2.70E+03		ug/L	P309952	
	EPA 200.8 Rev. 5.4	Arsenic	6.00		ug/L	P309952	
		Cadmium	0.063	I	ug/L	P309952	
		Chromium	4.98		ug/L	P309952	
		Copper	3.3		ug/L	P309952	
		Lead	3.24		ug/L	P309952	
		Nickel	1.94		ug/L	P309952	
		Silver	0.015	U	ug/L	P309952	
		Zinc	9.5	I	ug/L	P309952	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: The result was confirmed on 08/29/2016.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 08/25/2016.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The result was confirmed on 08/23/2016.

Sample Location: ICW AT ST. JOE WALWAY DUPLICATE

Collection Date/Time: 08/17/2016 12:00

Field ID: G5NE0016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824629	EPA 180.1 Rev. 2.0	Turbidity	19		NTU	P310010	
	SM 2320 B-97	Total Alkalinity	134		mg CaCO3/L	P310237	
	SM 2540 D-97	TSS	36		mg/L	P310503	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P310365	
1824631	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P310057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P310085	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P310238	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P309994	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P310369	
1824633	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.033		mg P/L	P309981	
1824666	EPA 200.7 Rev. 4.4	Iron	830		ug/L	P309952	
	EPA 200.8 Rev. 5.4	Arsenic	4.09		ug/L	P309952	
		Cadmium	0.060	U	ug/L	P309952	
		Chromium	1.69		ug/L	P309952	
		Copper	1.5		ug/L	P309952	
		Lead	0.89		ug/L	P309952	
		Nickel	0.87		ug/L	P309952	
		Silver	0.015	U	ug/L	P309952	
		Zinc	3.0	U	ug/L	P309952	

Field ID: G5NE0016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: The result was confirmed on 08/29/2016.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 08/25/2016.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The result was confirmed on 08/23/2016.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P310010

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P310011

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P309952

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P309952

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
Zinc	1.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P310538

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P310541

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P310057

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310057

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310058

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310079

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310238

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310346

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309994

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309981

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

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

Reference Method: SM 2120 B
Batch ID: P309986

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310234

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

Reference Method: SM 2320 B-97
Batch ID: P310237

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

Reference Method: SM 2540 C-97
Batch ID: P310610

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310500

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310503

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P310365

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: P310368

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

Reference Method: SM 5310 B-00
Batch ID: P310369

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: P309952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.9		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	97.3		P	85 - 115
Lead	99.9		P	85 - 115
Nickel	98.0		P	85 - 115
Silver	101		P	85 - 115
Zinc	98.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310538

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310541

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310057

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310058

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310079

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310238

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: P310346

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309994

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P310234

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

Reference Method: SM 2320 B-97
Batch ID: P310237

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

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P310365

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P310369

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821625	Iron	98.2	102	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821625	Arsenic	101	104	P/P	70 - 130
1821625	Cadmium	95.6	96.7	P/P	70 - 130
1821625	Chromium	87.4	86.7	P/P	70 - 130
1821625	Copper	90.1	92.8	P/P	70 - 130
1821625	Lead	103	104	P/P	70 - 130
1821625	Nickel	93.3	95.2	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821625	Silver	92.7	93.5	P/P	70 - 130
1821625	Zinc	89.6	91.5	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826916	Chloride	101	100	P/P	90 - 110
1826917	Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826916	Sulfate	101	100	P/P	90 - 110
1826917	Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824553	Ammonia-N	105	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824624	Ammonia-N	101	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824624	Kjeldahl Nitrogen	86.4	109	F/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824630	Kjeldahl Nitrogen	93.7	93.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310238

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824747	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824611	NO2NO3-N	94.4	93.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823943	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824624	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824590	O-Phosphate-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824538	O-Phosphate-P	98.8	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824610	Fluoride	98.6	100	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P310365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824742	Fluoride	98.5	99.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824227	Organic Carbon	100	93.5	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P310369

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824009	Organic Carbon	93.6	95.6	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824746	Turbidity	0.900	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824557	Turbidity	3.57	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1821625	Iron	3.96	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1821625	Arsenic	2.62	Spike	P	0 - 20
1821625	Cadmium	1.13	Spike	P	0 - 20
1821625	Chromium	0.710	Spike	P	0 - 20
1821625	Copper	2.92	Spike	P	0 - 20
1821625	Lead	1.32	Spike	P	0 - 20
1821625	Nickel	1.98	Spike	P	0 - 20
1821625	Silver	0.899	Spike	P	0 - 20
1821625	Zinc	2.18	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826916	Chloride	1.10	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826916	Sulfate	0.856	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824553	Ammonia-N	1.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824624	Ammonia-N	1.28	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824624	Kjeldahl Nitrogen	12.1	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824630	Kjeldahl Nitrogen	0.0751	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310238

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824747	NO2NO3-N	0.466	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824611	NO2NO3-N	0.517	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823943	Total-P	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824624	Total-P	0.536	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824590	O-Phosphate-P	0.965	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824538	O-Phosphate-P	0.159	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824622	Color (true)	1.40	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P310234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824610	Total Alkalinity	0.616	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P310237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824742	Total Alkalinity	0.0265	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P310610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824622	TDS	0.325	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824610	Fluoride	1.46	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P310365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824742	Fluoride	1.01	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824227	Organic Carbon	4.25	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P310369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824009	Organic Carbon	1.10	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: A71210
Included Lab Sample IDs: 1824626, 1824627, 1824632, 1824633

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

Reference Method: SM 2120 B
Run ID: A71211
Included Lab Sample IDs: 1824622, 1824623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	98.9	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71225
Included Lab Sample IDs: 1824622, 1824623, 1824628, 1824629

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71238
Included Lab Sample IDs: 1824624, 1824625, 1824630, 1824631

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71251
Included Lab Sample IDs: 1824624, 1824625, 1824630, 1824631

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71256

Included Lab Sample IDs: 1824665, 1824666

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	93.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71266

Included Lab Sample IDs: 1824665, 1824666

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	99.6	P/P	90 - 110
Cadmium	95.6	96.9	P/P	90 - 110
Chromium	93.5	91.4	P/P	90 - 110
Copper	95.0	101	P/P	90 - 110
Lead	96.5	98.1	P/P	90 - 110
Nickel	95.4	101	P/P	90 - 110
Silver	96.7	98.6	P/P	90 - 110
Zinc	95.7	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71276

Included Lab Sample IDs: 1824624, 1824625, 1824630, 1824631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	109	P/P	90 - 110
Kjeldahl Nitrogen	103	102	P/P	90 - 110
Kjeldahl Nitrogen	104	108	P/P	90 - 110
Kjeldahl Nitrogen	105	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71287

Included Lab Sample IDs: 1824630, 1824631

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

Reference Method: SM 2320 B-97

Run ID: A71291

Included Lab Sample IDs: 1824622, 1824623, 1824628, 1824629

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

Reference Method: SM 4500 F-C-97

Run ID: A71291

Included Lab Sample IDs: 1824622, 1824623

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71323
Included Lab Sample IDs: 1824624, 1824625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.0	96.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71330
Included Lab Sample IDs: 1824628, 1824629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	97.6	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71332
Included Lab Sample IDs: 1824624, 1824625, 1824630, 1824631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.3	94.4	P/P	90 - 110
Organic Carbon	96.8	92.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71337
Included Lab Sample IDs: 1824622, 1824623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	101	P/P	90 - 110
Chloride	99.8	100	P/P	90 - 110
Sulfate	98.0	101	P/P	90 - 110
Sulfate	99.5	99.6	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.900	
	Turbidity				3.57	
EPA 200.7 Rev. 4.4	Iron	101	98.2 102			3.96
EPA 200.8 Rev. 5.4	Arsenic	98.9	101 104			2.62
	Cadmium	99.5	95.6 96.7			1.13
	Chromium	99.5	87.4 86.7			0.710
	Copper	97.3	90.1 92.8			2.92
	Lead	99.9	103 104			1.32
	Nickel	98.0	93.3 95.2			1.98
	Silver	101	92.7 93.5			0.899
	Zinc	98.1	89.6 91.5			2.18
EPA 300.0 Rev. 2.1	Chloride	99.8	101 100	99.6		1.10
	Sulfate	98.6	101 100	99.8		0.856
EPA 350.1 Rev. 2.0	Ammonia-N	102	105 104			1.07

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	103	101	99.5			1.28
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	86.4	109			12.1
	Kjeldahl Nitrogen	107	93.7	93.6			0.0751
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101			0.466
	NO2NO3-N	98.0	94.4	93.8			0.517
EPA 365.1 Rev. 2.0	Total-P	101	101	102			1.00
	Total-P	98.9	101	102			0.536
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	103	104			0.965
	O-Phosphate-P	104	98.8	99.0			0.159
SM 2120 B	Color (true)					1.40	
SM 2320 B-97	Total Alkalinity	104				0.616	
	Total Alkalinity	104				0.0265	
SM 2540 C-97	TDS					0.325	
SM 4500 F-C-97	Fluoride	97.8	98.6	100			1.46
	Fluoride	98.1	98.5	99.7			1.01
SM 5310 B-00	Organic Carbon	96.5	100	93.5			4.25
	Organic Carbon	95.8	93.6	95.6			1.10

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1824622, 1824623, 1824628, 1824629
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1824665, 1824666
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1824665, 1824666
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1824622, 1824623
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1824622, 1824623
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1824624, 1824625, 1824630, 1824631
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1824624, 1824625, 1824630, 1824631
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1824624, 1824625, 1824630, 1824631
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1824624, 1824625, 1824630, 1824631
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1824626, 1824627, 1824632, 1824633
SM 2120 B / E31780	True Color measured at 450 nm	1824622, 1824623
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1824622, 1824623, 1824628, 1824629
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1824622, 1824623
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1824622, 1824623, 1824628, 1824629
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1824622, 1824623, 1824628, 1824629
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1824624, 1824625, 1824630, 1824631

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	08/18/2016			08/18/2016 16:04	Blanca Fach	1824622, 1824623, 1824628, 1824629
EPA 200.7 Rev. 4.4	08/18/2016	08/18/2016	Elliott D. Healy	08/22/2016	Joshua Ayres	1824665, 1824666
EPA 200.8 Rev. 5.4	08/18/2016	08/18/2016	Elliott D. Healy	08/22/2016	Charles J. Peterson	1824665, 1824666
EPA 300.0 Rev. 2.1	08/18/2016			08/26/2016	Ping Hua	1824622, 1824623
EPA 350.1 Rev. 2.0	08/18/2016			08/21/2016	Julie Michelle Frank	1824624, 1824625, 1824630, 1824631
EPA 351.2 Rev. 2.0	08/18/2016	08/22/2016	Adrian Shelby	08/23/2016	Christopher Armour	1824624, 1824625
	08/18/2016	08/22/2016	Sofia Elnemr	08/23/2016	Christopher Armour	1824630, 1824631
EPA 353.2 Rev. 2.0	08/18/2016			08/22/2016	Beverly Y. Sanders	1824630, 1824631
	08/18/2016			08/25/2016	Beverly Y. Sanders	1824624, 1824625
EPA 365.1 Rev. 2.0	08/18/2016	08/19/2016	Vijayalakshmi Reddy	08/22/2016	Lipi Saha	1824624, 1824625, 1824630, 1824631
EPA 365.1 Rev. 2.0 dissolved	08/18/2016			08/18/2016 15:43	Julia Storbeck	1824627
	08/18/2016			08/18/2016 15:51	Julia Storbeck	1824626
	08/18/2016			08/18/2016 15:59	Julia Storbeck	1824632
	08/18/2016			08/18/2016 16:00	Julia Storbeck	1824633
SM 2120 B	08/18/2016			08/18/2016 16:00	Rochelle Y Jackson	1824622, 1824623
SM 2320 B-97	08/18/2016			08/23/2016	Dale L. Simmons	1824622, 1824623
	08/18/2016			08/24/2016	Dale L. Simmons	1824628, 1824629
SM 2540 C-97	08/18/2016			08/22/2016	Sima Feizi	1824622, 1824623
SM 2540 D-97	08/18/2016			08/22/2016	Sima Feizi	1824622, 1824623, 1824628, 1824629
SM 4500 F-C-97	08/18/2016			08/23/2016	Dale L. Simmons	1824622, 1824623
	08/18/2016			08/25/2016	Dale L. Simmons	1824628, 1824629
SM 5310 B-00	08/18/2016			08/25/2016	Sofia Elnemr	1824624, 1824625, 1824630, 1824631