

Chemical Analysis Report

NE-DIST-2019-05-09-01

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

Event Description: **UEC**
Request ID: **RQ-2019-05-06-19**
Customer: **NE-DIST**
Project ID: **SMP**

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Date Certified: 23-MAY-2019 14:41



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: LAKE VEDRA AT SOLANA RD.

Collection Date/Time: 05/08/2019 12:00

Field ID: 27010180

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085024	EPA 180.1 Rev. 2.0	Turbidity	9.5		NTU	P363735	
	EPA 300.0 Rev. 2.1	Chloride	130		mg Cl/L	P363882	
		Sulfate	95		mg SO4/L	P363885	
		Color (true)	52		PCU	P363726	
	SM 2320 B-97	Total Alkalinity	141		mg CaCO3/L	P364259	
	SM 2540 C-97	TDS	488		mg/L	P364145	
	SM 2540 D-97	TSS	18		mg/L	P364240	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P364263	
2085025	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P364044	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P364074	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364119	
	EPA 365.1 Rev. 2.0	Total-P	0.27		mg P/L	P363966	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P364049	
2085026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.079		mg P/L	P363702	
2085050	EPA 200.7 Rev. 4.4	Barium	11.7		ug/L	P363846	
		Calcium	63.5		mg/L	P363846	
		Iron	30	U	ug/L	P363846	
		Magnesium	18.6		mg/L	P363846	
		Potassium	7.8		mg/L	P363846	
		Sodium	73.6		mg/L	P363846	
		Zinc	5.0	U	ug/L	P363846	
	EPA 200.8 Rev. 5.4	Aluminum	116		ug/L	P363846	
		Antimony	0.20	I	ug/L	P363846	
		Arsenic	11.3		ug/L	P363846	
		Boron**	79.3		ug/L	P363846	
		Cadmium	0.020	U	ug/L	P363846	
		Chromium	0.80	I	ug/L	P363846	
		Copper	3.56		ug/L	P363846	
		Lead	0.20	U	ug/L	P363846	
		Nickel	0.51	I	ug/L	P363846	
		Selenium	0.20	U	ug/L	P363846	
		Silver	0.010	U	ug/L	P363846	
		Thallium	0.10	U	ug/L	P363846	

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

Sample Location: MOSES CR AT US 1

Collection Date/Time: 05/08/2019 10:15

Field ID: 27010050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085021	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P363735	
	EPA 300.0 Rev. 2.1	Chloride	56		mg Cl/L	P363882	
		Sulfate	14		mg SO4/L	P363885	
		Color (true)	97	A	PCU	P363726	
	SM 2320 B-97	Total Alkalinity	136		mg CaCO3/L	P364259	
	SM 2540 C-97	TDS	296	A	mg/L	P364144	
	SM 2540 D-97	TSS	4	IA	mg/L	P364239	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P364263	
2085022	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P363911	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P364074	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.077		mg N/L	P364119	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P363966	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P364049	
2085023	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.066		mg P/L	P363702	
2085049	EPA 200.7 Rev. 4.4	Barium	27.3		ug/L	P363846	
		Calcium	53.1		mg/L	P363846	
		Iron	650		ug/L	P363846	
		Magnesium	5.54		mg/L	P363846	
		Potassium	1.0	I	mg/L	P363846	
		Sodium	30.9		mg/L	P363846	
		Zinc	5.0	U	ug/L	P363846	
		Aluminum	107		ug/L	P363846	
		Antimony	0.11	I	ug/L	P363846	
		Arsenic	1.06		ug/L	P363846	
	EPA 200.8 Rev. 5.4	Boron**	34.6		ug/L	P363846	
		Cadmium	0.020	U	ug/L	P363846	
		Chromium	0.40	U	ug/L	P363846	
		Copper	0.49	I	ug/L	P363846	
		Lead	0.20	U	ug/L	P363846	
		Nickel	0.50	U	ug/L	P363846	
		Selenium	0.20	U	ug/L	P363846	
		Silver	0.010	U	ug/L	P363846	
		Thallium	0.10	U	ug/L	P363846	

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

Sample Location: CRACKER BR. @ CR 204

Collection Date/Time: 05/08/2019 09:55

Field ID: 27010060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085027	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P363735	
	EPA 300.0 Rev. 2.1	Chloride	52		mg Cl/L	P363882	
		Sulfate	18		mg SO4/L	P363885	
	SM 2120 B	Color (true)	75		PCU	P363726	
	SM 2320 B-97	Total Alkalinity	70		mg CaCO3/L	P364259	
	SM 2540 C-97	TDS	202	A	mg/L	P364145	
	SM 2540 D-97	TSS	2	IA	mg/L	P364240	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P364263	
2085029	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P364044	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P364074	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.051		mg N/L	P364119	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P363966	
	SM 5310 B-00	Organic Carbon	8.2		mg C/L	P364049	
2085031	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P363702	

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

Sample Location: Palm Coast Canal 0.6mi down from road

Collection Date/Time: 05/08/2019 09:25

Field ID: G5NE0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085028	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P363735	
	EPA 300.0 Rev. 2.1	Chloride	43		mg Cl/L	P363882	
		Sulfate	11		mg SO4/L	P363885	
	SM 2120 B	Color (true)	76		PCU	P363726	
	SM 2320 B-97	Total Alkalinity	116		mg CaCO3/L	P364259	
	SM 2540 C-97	TDS	212		mg/L	P364145	
	SM 2540 D-97	TSS	4	I	mg/L	P364240	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P364263	
2085030	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P364044	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P364074	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P364119	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P363966	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P364049	
2085032	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.093		mg P/L	P363702	

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363735

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363846

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363846

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363882

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363885

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363911

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364074

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364119

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363966

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

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

Reference Method: SM 2120 B
Batch ID: P363726

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P364259

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

Reference Method: SM 2540 C-97
Batch ID: P364144

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P364145

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P364239

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364240

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P364049

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: P363846

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	92.0		P	85 - 115
Iron	94.8		P	85 - 115
Magnesium	99.7		P	85 - 115
Potassium	93.3		P	85 - 115
Sodium	92.6		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363846

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.8		P	85 - 115
Antimony	96.7		P	85 - 115
Arsenic	101		P	85 - 115
Boron	98.4		P	85 - 115
Cadmium	99.4		P	85 - 115
Chromium	98.3		P	85 - 115
Copper	101		P	85 - 115
Lead	92.4		P	85 - 115
Nickel	99.7		P	85 - 115
Selenium	101		P	85 - 115
Silver	98.9		P	85 - 115
Thallium	99.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363882

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363885

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363911

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

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 351.2 Rev. 2.0
Batch ID: P364074

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364119

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363966

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: P363702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P363726

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P364259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P364049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084549	Barium	100		P	80 - 120
2084549	Calcium	94.2		P	80 - 120
2084549	Iron	97.8		P	80 - 120
2084549	Magnesium	102		P	80 - 120
2084549	Potassium	91.6		P	80 - 120
2084549	Sodium	92.5		P	80 - 120
2084549	Zinc	102		P	80 - 120
2084918	Barium	101	101	P/P	80 - 120
2084918	Calcium	92.3		P	80 - 120
2084918	Iron	96.0	97.3	P/P	80 - 120
2084918	Magnesium	99.5	101	P/P	80 - 120
2084918	Potassium	93.5	93.5	P/P	80 - 120
2084918	Sodium	92.4		P	80 - 120
2084918	Zinc	103	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084549	Aluminum	95.6		P	80 - 120
2084549	Antimony	97.0		P	80 - 120
2084549	Arsenic	102		P	80 - 120
2084549	Boron	99.6		P	80 - 120
2084549	Cadmium	99.1		P	80 - 120
2084549	Chromium	97.2		P	80 - 120
2084549	Copper	98.5		P	80 - 120
2084549	Lead	92.8		P	80 - 120
2084549	Nickel	98.9		P	80 - 120
2084549	Selenium	100		P	80 - 120
2084549	Silver	96.6		P	80 - 120
2084549	Thallium	101		P	80 - 120
2084918	Aluminum	96.2	105	P/P	80 - 120
2084918	Antimony	95.6	105	P/P	80 - 120
2084918	Arsenic	100	109	P/P	80 - 120
2084918	Boron	100	111	P/P	80 - 120
2084918	Cadmium	98.2	108	P/P	80 - 120
2084918	Chromium	99.7	108	P/P	80 - 120
2084918	Copper	101	110	P/P	80 - 120
2084918	Lead	92.4	101	P/P	80 - 120
2084918	Nickel	99.5	108	P/P	80 - 120
2084918	Selenium	96.6	107	P/P	80 - 120
2084918	Silver	97.6	99.4	P/P	80 - 120
2084918	Thallium	101	113	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084669	Chloride	100		P	90 - 110
2085021	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084669	Sulfate	100		P	90 - 110
2085021	Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084906	Ammonia-N	106	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085035	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084905	NO2NO3-N	99.4	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085036	Total-P	99.6	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085189	O-Phosphate-P	94.2	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085112	Fluoride	100	98.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P364049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084906	Organic Carbon	99.2	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084902	Turbidity	0.242	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084918	Barium	0.502	Spike	P	0 - 20
2084918	Calcium	0.878	Spike	P	0 - 20
2084918	Iron	1.30	Spike	P	0 - 20
2084918	Magnesium	1.24	Spike	P	0 - 20
2084918	Potassium	0.0637	Spike	P	0 - 20
2084918	Sodium	0.480	Spike	P	0 - 20
2084918	Zinc	0.506	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084918	Aluminum	9.03	Spike	P	0 - 20
2084918	Antimony	9.69	Spike	P	0 - 20
2084918	Arsenic	8.66	Spike	P	0 - 20
2084918	Boron	8.01	Spike	P	0 - 20
2084918	Cadmium	9.30	Spike	P	0 - 20
2084918	Chromium	8.17	Spike	P	0 - 20
2084918	Copper	7.85	Spike	P	0 - 20
2084918	Lead	9.31	Spike	P	0 - 20
2084918	Nickel	8.21	Spike	P	0 - 20
2084918	Selenium	10.4	Spike	P	0 - 20
2084918	Silver	1.82	Spike	P	0 - 20
2084918	Thallium	11.0	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084669	Chloride	0.262	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084669	Sulfate	0.129	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084906	Ammonia-N	0.247	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085035	Ammonia-N	1.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364074

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085025	Kjeldahl Nitrogen	0.555	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084905	NO2NO3-N	0.952	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085036	Total-P	0.227	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085189	O-Phosphate-P	1.79	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P363726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085021	Color (true)	0.788	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085112	Total Alkalinity	0.366	Sample	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P364144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085021	TDS	3.71	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P364145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085027	TDS	6.42	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085112	Fluoride	1.45	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P364049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084906	Organic Carbon	0.921	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: A91331

Included Lab Sample IDs: 2085023, 2085026, 2085031, 2085032

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.7	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A91338

Included Lab Sample IDs: 2085021, 2085024, 2085027, 2085028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91343

Included Lab Sample IDs: 2085021, 2085024, 2085027, 2085028

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A91404

Included Lab Sample IDs: 2085021, 2085024, 2085027, 2085028

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91412

Included Lab Sample IDs: 2085022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	106	106	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91422

Included Lab Sample IDs: 2085049, 2085050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.4	98.9	P/P	90 - 110
Antimony	95.2	95.2	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Boron	104	105	P/P	90 - 110
Cadmium	98.7	99.5	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Copper	103	102	P/P	90 - 110
Lead	93.6	94.1	P/P	90 - 110
Nickel	102	102	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	98.9	99.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91422

Included Lab Sample IDs: 2085049, 2085050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	97.3	96.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A91424

Included Lab Sample IDs: 2085049, 2085050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	102	P/P	90 - 110
Calcium	99.6	98.9	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Potassium	99.2	98.6	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91468

Included Lab Sample IDs: 2085025, 2085029, 2085030

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

Reference Method: SM 5310 B-00

Run ID: A91470

Included Lab Sample IDs: 2085022, 2085025, 2085029, 2085030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91477

Included Lab Sample IDs: 2085022, 2085025, 2085029, 2085030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	102	P/P	90 - 110
Total-P	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91494

Included Lab Sample IDs: 2085022, 2085025, 2085029, 2085030

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91516

Included Lab Sample IDs: 2085022, 2085025, 2085029, 2085030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.2	P/P	90 - 110
Kjeldahl Nitrogen	107	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A91544

Included Lab Sample IDs: 2085021, 2085024, 2085027, 2085028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.2	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A91544

Included Lab Sample IDs: 2085021, 2085024, 2085027, 2085028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.0	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.242	
EPA 200.7 Rev. 4.4	Barium	101	100	101	101		0.502
	Calcium	92.0	94.2	92.3			0.878
	Iron	94.8	97.8	96.0	97.3		1.30
	Magnesium	99.7	102	99.5	101		1.24
	Potassium	93.3	91.6	93.5	93.5		0.0637
	Sodium	92.6	92.5	92.4			0.480
	Zinc	99.7	102	103	104		0.506
EPA 200.8 Rev. 5.4	Aluminum	97.8	95.6	96.2	105		9.03
	Antimony	96.7	97.0	95.6	105		9.69
	Arsenic	101	102	100	109		8.66
	Boron	98.4	99.6	100	111		8.01
	Cadmium	99.4	99.1	98.2	108		9.30
	Chromium	98.3	97.2	99.7	108		8.17
	Copper	101	101	110	98.5		7.85
	Lead	92.4	92.8	92.4	101		9.31
	Nickel	99.7	98.9	99.5	108		8.21
	Selenium	101	100	96.6	107		10.4
	Silver	98.9	96.6	97.6	99.4		1.82
	Thallium	99.2	101	101	113		11.0
EPA 300.0 Rev. 2.1	Chloride	101	100	101		0.262	
	Sulfate	101	100	99.8		0.129	
EPA 350.1 Rev. 2.0	Ammonia-N	104	106	105			0.247
	Ammonia-N	102	101	102			1.17
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.4					0.555
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.4	98.4			0.952
EPA 365.1 Rev. 2.0	Total-P	100	99.6	99.9			0.227
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	94.2	95.9			1.79
SM 2120 B	Color (true)	100				0.788	
SM 2320 B-97	Total Alkalinity	102				0.366	
SM 2540 C-97	TDS					3.71	
	TDS					6.42	
SM 4500 F-C-97	Fluoride	98.5	100	98.1			1.45
SM 5310 B-00	Organic Carbon	96.6	99.2	100			0.921

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2085021, 2085024, 2085027, 2085028
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2085049, 2085050
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2085049, 2085050
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2085021, 2085024, 2085027, 2085028
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2085021, 2085024, 2085027, 2085028
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2085022, 2085025, 2085029, 2085030
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2085022, 2085025, 2085029, 2085030
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2085022, 2085025, 2085029, 2085030

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2085022, 2085025, 2085029, 2085030
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2085023, 2085026, 2085031, 2085032
SM 2120 B / E31780	True Color measured at 450 nm	2085021, 2085024, 2085027, 2085028
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2085021, 2085024, 2085027, 2085028
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2085021, 2085024, 2085027, 2085028
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2085021, 2085024, 2085027, 2085028
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2085021, 2085024, 2085027, 2085028
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2085022, 2085025, 2085029, 2085030

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	05/09/2019			05/09/2019 16:45	Sima Feizi	2085021, 2085024, 2085027, 2085028
EPA 200.7 Rev. 4.4	05/09/2019	05/13/2019 14:50	Elliott D. Healy	05/14/2019 17:01	Betina Topolski	2085049
	05/09/2019	05/13/2019 14:50	Elliott D. Healy	05/14/2019 17:07	Betina Topolski	2085050
EPA 200.8 Rev. 5.4	05/09/2019	05/13/2019 14:50	Elliott D. Healy	05/15/2019 00:11	Robert K Palmer	2085049
	05/09/2019	05/13/2019 14:50	Elliott D. Healy	05/15/2019 00:21	Robert K Palmer	2085050
EPA 300.0 Rev. 2.1	05/09/2019			05/14/2019 02:53	Lipi Saha	2085021
	05/09/2019			05/14/2019 05:43	Lipi Saha	2085024
	05/09/2019			05/14/2019 05:55	Lipi Saha	2085027
	05/09/2019			05/14/2019 06:31	Lipi Saha	2085028
EPA 350.1 Rev. 2.0	05/09/2019			05/13/2019 14:51	Ping Hua	2085022
	05/09/2019			05/15/2019 11:58	Ping Hua	2085025
	05/09/2019			05/15/2019 12:00	Ping Hua	2085029
	05/09/2019			05/15/2019 12:01	Ping Hua	2085030
EPA 351.2 Rev. 2.0	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 15:25	Joseph Suarez	2085022
	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 15:30	Joseph Suarez	2085025
	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 15:34	Joseph Suarez	2085029
	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 15:36	Joseph Suarez	2085030
EPA 353.2 Rev. 2.0	05/09/2019			05/17/2019 09:27	Beverly Y. Sanders	2085022
	05/09/2019			05/17/2019 09:28	Beverly Y. Sanders	2085025
	05/09/2019			05/17/2019 09:29	Beverly Y. Sanders	2085029
	05/09/2019			05/17/2019 09:30	Beverly Y. Sanders	2085030
EPA 365.1 Rev. 2.0	05/09/2019	05/15/2019 11:26	Joseph Suarez	05/16/2019 13:49	Rosalyn Ballman	2085022
	05/09/2019	05/15/2019 11:26	Joseph Suarez	05/16/2019 13:50	Rosalyn Ballman	2085025
	05/09/2019	05/15/2019 11:26	Joseph Suarez	05/16/2019 13:51	Rosalyn Ballman	2085029
	05/09/2019	05/15/2019 11:26	Joseph Suarez	05/16/2019 13:55	Rosalyn Ballman	2085030
EPA 365.1 Rev. 2.0 dissolved	05/09/2019			05/09/2019 15:18	Jhamieka S. Greenwood	2085023
	05/09/2019			05/09/2019 15:19	Jhamieka S. Greenwood	2085026, 2085031
	05/09/2019			05/09/2019 15:20	Jhamieka S. Greenwood	2085032
SM 2120 B	05/09/2019			05/09/2019 14:40	Blanca Fach	2085021
	05/09/2019			05/09/2019 14:43	Blanca Fach	2085024
	05/09/2019			05/09/2019 14:44	Blanca Fach	2085027
	05/09/2019			05/09/2019 14:45	Blanca Fach	2085028
SM 2320 B-97	05/09/2019			05/18/2019 04:35	Dale L. Simmons	2085021
	05/09/2019			05/18/2019 04:49	Dale L. Simmons	2085024
	05/09/2019			05/18/2019 05:02	Dale L. Simmons	2085027
	05/09/2019			05/18/2019 05:15	Dale L. Simmons	2085028
SM 2540 C-97	05/09/2019			05/10/2019 16:05	Yijie Li	2085021, 2085024, 2085027, 2085028
SM 2540 D-97	05/09/2019			05/10/2019 16:05	Yijie Li	2085021, 2085024, 2085027, 2085028
SM 4500 F-C-97	05/09/2019			05/18/2019 04:35	Dale L. Simmons	2085021
	05/09/2019			05/18/2019 04:49	Dale L. Simmons	2085024

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-97	05/09/2019			05/18/2019 05:02	Dale L. Simmons	2085027
	05/09/2019			05/18/2019 05:15	Dale L. Simmons	2085028
SM 5310 B-00	05/09/2019			05/15/2019 21:42	Julia Storbeck	2085022
	05/09/2019			05/15/2019 21:56	Julia Storbeck	2085025
	05/09/2019			05/15/2019 22:08	Julia Storbeck	2085029
	05/09/2019			05/15/2019 22:20	Julia Storbeck	2085030