

Chemical Analysis Report

SE-DIST-2019-05-10-01

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

Event Description: **SMP-Horses**
Request ID: **RQ-2019-05-06-44**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 30-MAY-2019 16:00

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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 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: PINE LAKE CENTER

Collection Date/Time: 05/09/2019 10:30

Field ID: G3SE0045

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085594	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P363792	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P364027	
		Sulfate	8.5		mg SO4/L	P364029	
	SM 2120 B	Color (true)	25		PCU	P363786	
	SM 2320 B-97	Total Alkalinity	104		mg CaCO3/L	P364260	
	SM 2540 C-97	TDS	165		mg/L	P364270	
	SM 2540 D-97	TSS	6	I	mg/L	P364256	
	SM 4500 F-C-97	Fluoride	0.069	I	mg F/L	P364582	
2085595	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P364150	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78	J	mg N/L	P364232	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P364123	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P364105	
	SM 5310 B-00	Organic Carbon	7.2		mg C/L	P364107	
2085596	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P363796	

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: M-CANAL @ HAVERHILL

Collection Date/Time: 05/09/2019 11:15

Field ID: G3SE0029

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085591	EPA 180.1 Rev. 2.0	Turbidity	5.8		NTU	P363792	
	EPA 300.0 Rev. 2.1	Chloride	62		mg Cl/L	P364027	
		Sulfate	26		mg SO4/L	P364029	
		Color (true)	42		PCU	P363786	
	SM 2120 B	Total Alkalinity	126		mg CaCO3/L	P364260	
	SM 2540 C-97	TDS	293		mg/L	P364270	
	SM 2540 D-97	TSS	7	I	mg/L	P364256	
	SM 4500 F-C-97	Fluoride	0.21		mg F/L	P364582	
2085592	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P364150	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P364232	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P364123	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P364105	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P364107	
2085593	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P363794	
2085605	EPA 200.7 Rev. 4.4	Barium	26.6		ug/L	P363918	
		Calcium	45.5		mg/L	P363918	
		Iron	180		ug/L	P363918	
		Magnesium	10.9		mg/L	P363918	
		Potassium	6.4		mg/L	P363918	
		Sodium	38.7		mg/L	P363918	
		Zinc	5.0	U	ug/L	P363918	
	EPA 200.8 Rev. 5.4	Aluminum	126		ug/L	P363918	
		Antimony	0.11	I	ug/L	P363918	
		Arsenic	1.40		ug/L	P363918	
		Boron**	60.8		ug/L	P363918	
		Cadmium	0.020	U	ug/L	P363918	
		Chromium	0.40	U	ug/L	P363918	
		Copper	0.89		ug/L	P363918	
		Lead	0.20	U	ug/L	P363918	
		Nickel	0.50	U	ug/L	P363918	
		Selenium	0.20	U	ug/L	P363918	
		Silver	0.010	U	ug/L	P363918	
		Thallium	0.10	U	ug/L	P363918	

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: L-8 @ G-541

Collection Date/Time: 05/09/2019 12:30

Field ID: G3SE0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085588	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P363792	
	EPA 300.0 Rev. 2.1	Chloride	79		mg Cl/L	P364027	
		Sulfate	39		mg SO4/L	P364029	
		Color (true)	67		PCU	P363786	
	SM 2120 B	Total Alkalinity	162		mg CaCO3/L	P364260	
	SM 2540 C-97	TDS	390	A	mg/L	P364270	
	SM 2540 D-97	TSS	8	IA	mg/L	P364256	
	SM 4500 F-C-97	Fluoride	0.34		mg F/L	P364582	
2085589	EPA 350.1 Rev. 2.0	Ammonia-N	0.075		mg N/L	P364150	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P364231	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.35		mg N/L	P364123	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P364105	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P364107	
2085590	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.084		mg P/L	P363794	
2085604	EPA 200.7 Rev. 4.4	Barium	42.2		ug/L	P363918	
		Calcium	61.1		mg/L	P363918	
		Iron	210		ug/L	P363918	
		Magnesium	15.9		mg/L	P363918	
		Potassium	7.9		mg/L	P363918	
		Sodium	51.9		mg/L	P363918	
		Zinc	5.0	U	ug/L	P363918	
	EPA 200.8 Rev. 5.4	Aluminum	149		ug/L	P363918	
		Antimony	0.14	I	ug/L	P363918	
		Arsenic	2.05		ug/L	P363918	
		Boron**	85.3		ug/L	P363918	
		Cadmium	0.020	U	ug/L	P363918	
		Chromium	0.40	U	ug/L	P363918	
		Copper	0.98		ug/L	P363918	
		Lead	0.20	U	ug/L	P363918	
		Nickel	0.50	U	ug/L	P363918	
		Selenium	0.21	I	ug/L	P363918	
		Silver	0.010	U	ug/L	P363918	
		Thallium	0.10	U	ug/L	P363918	

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: SOUTH SHORE BLVD 2

Collection Date/Time: 05/09/2019 13:35

Field ID: G3SE0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085597	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P363792	
	EPA 300.0 Rev. 2.1	Chloride	69		mg Cl/L	P364027	
		Sulfate	24		mg SO4/L	P364029	
	SM 2120 B	Color (true)	53	A	PCU	P363787	
	SM 2320 B-97	Total Alkalinity	192		mg CaCO3/L	P364260	
	SM 2540 C-97	TDS	380		mg/L	P364270	
	SM 2540 D-97	TSS	6	I	mg/L	P364256	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P364582	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P364150	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P364232	MS
2085598	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P364211	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P364105	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P364107	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.016		mg P/L	P363796	
	dissolved						

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363792

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363918

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: P363918

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: P364027

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364029

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364150

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364231

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364232

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364123

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364211

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364105

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363794

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363796

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

Reference Method: SM 2120 B
Batch ID: P363786

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P363787

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P364260

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

Reference Method: SM 2540 C-97
Batch ID: P364270

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364256

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364582

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P364107

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: P363918

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	109		P	85 - 115
Iron	106		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363918

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	105		P	85 - 115
Boron	101		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	101		P	85 - 115
Copper	104		P	85 - 115
Lead	93.9		P	85 - 115
Nickel	104		P	85 - 115
Selenium	104		P	85 - 115
Silver	103		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364027

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364029

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364150

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364123

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364211

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364105

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363794

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.4		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P363786

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P363787

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

Reference Method: SM 2320 B-97
Batch ID: P364260

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364582

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

Reference Method: SM 5310 B-00
Batch ID: P364107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085213	Barium	101		P	80 - 120
2085213	Calcium	104		P	80 - 120
2085213	Iron	109		P	80 - 120
2085213	Magnesium	103		P	80 - 120
2085213	Potassium	99.7		P	80 - 120
2085213	Sodium	101		P	80 - 120
2085213	Zinc	101		P	80 - 120
2085651	Barium	101	101	P/P	80 - 120
2085651	Calcium	107	107	P/P	80 - 120
2085651	Iron	106	105	P/P	80 - 120
2085651	Magnesium	111	110	P/P	80 - 120
2085651	Potassium	106	106	P/P	80 - 120
2085651	Sodium	103	104	P/P	80 - 120
2085651	Zinc	101	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085213	Aluminum	99.9		P	80 - 120
2085213	Antimony	102		P	80 - 120
2085213	Arsenic	103		P	80 - 120
2085213	Boron	103		P	80 - 120
2085213	Cadmium	104		P	80 - 120
2085213	Chromium	99.9		P	80 - 120
2085213	Copper	99.4		P	80 - 120
2085213	Lead	97.0		P	80 - 120
2085213	Nickel	100		P	80 - 120
2085213	Selenium	101		P	80 - 120
2085213	Silver	101		P	80 - 120
2085213	Thallium	106		P	80 - 120
2085651	Aluminum	111	108	P/P	80 - 120
2085651	Antimony	110	107	P/P	80 - 120
2085651	Arsenic	111	109	P/P	80 - 120
2085651	Boron	116	114	P/P	80 - 120
2085651	Cadmium	113	111	P/P	80 - 120
2085651	Chromium	112	110	P/P	80 - 120
2085651	Copper	111	110	P/P	80 - 120
2085651	Lead	110	107	P/P	80 - 120
2085651	Nickel	112	110	P/P	80 - 120
2085651	Selenium	109	105	P/P	80 - 120
2085651	Silver	112	110	P/P	80 - 120
2085651	Thallium	120	116	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364027

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085483	Chloride	96.3		P	90 - 110
2085594	Chloride	96.2		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085483	Sulfate	97.0		P	90 - 110
2085594	Sulfate	96.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085595	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085486	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085595	Kjeldahl Nitrogen	107	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364123

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085486	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085598	NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085598	Total-P	92.2	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085490	O-Phosphate-P	93.2	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085628	O-Phosphate-P	96.0	98.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364582

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085485	Fluoride	98.3	98.3	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P364107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085592	Organic Carbon	95.2	99.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085483	Turbidity	0.720	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085651	Barium	0.0602	Spike	P	0 - 20
2085651	Calcium	0.593	Spike	P	0 - 20
2085651	Iron	0.571	Spike	P	0 - 20
2085651	Magnesium	0.604	Spike	P	0 - 20
2085651	Potassium	0.566	Spike	P	0 - 20
2085651	Sodium	0.473	Spike	P	0 - 20
2085651	Zinc	0.163	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085651	Aluminum	2.12	Spike	P	0 - 20
2085651	Antimony	2.69	Spike	P	0 - 20
2085651	Arsenic	1.91	Spike	P	0 - 20
2085651	Boron	1.65	Spike	P	0 - 20
2085651	Cadmium	1.88	Spike	P	0 - 20
2085651	Chromium	1.70	Spike	P	0 - 20
2085651	Copper	0.900	Spike	P	0 - 20
2085651	Lead	3.23	Spike	P	0 - 20
2085651	Nickel	1.79	Spike	P	0 - 20
2085651	Selenium	4.15	Spike	P	0 - 20
2085651	Silver	1.65	Spike	P	0 - 20
2085651	Thallium	2.80	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364027

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085483	Chloride	0.0395	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085483	Sulfate	0.810	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085595	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085486	Kjeldahl Nitrogen	0.525	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085595	Kjeldahl Nitrogen	2.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364123

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085486	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085598	NO2NO3-N	1.94	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085598	Total-P	1.81	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085490	O-Phosphate-P	1.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085628	O-Phosphate-P	2.06	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P363786

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085483	Color (true)	1.14	Sample	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P363787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085597	Color (true)	0.443	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P364260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085485	Total Alkalinity	0.335	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P364270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085588	TDS	8.21	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P364582

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085485	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P364107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085592	Organic Carbon	2.29	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: SM 2120 B

Run ID: A91358

Included Lab Sample IDs: 2085588, 2085591, 2085594, 2085597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115
Color (true)	99.9	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91361

Included Lab Sample IDs: 2085588, 2085591, 2085594, 2085597

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A91362

Included Lab Sample IDs: 2085590, 2085593, 2085596, 2085599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	98.3	P/P	90 - 110
O-Phosphate-P	98.3	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A91404

Included Lab Sample IDs: 2085588, 2085591, 2085594, 2085597

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

Reference Method: SM 5310 B-00

Run ID: A91471

Included Lab Sample IDs: 2085589, 2085592, 2085595, 2085598

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.8	95.6	P/P	90 - 110
Organic Carbon	95.6	94.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A91484

Included Lab Sample IDs: 2085604, 2085605

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.8	P/P	90 - 110
Calcium	103	101	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	100	100	P/P	90 - 110
Sodium	99.8	100	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91494

Included Lab Sample IDs: 2085589, 2085592, 2085595

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91506

Included Lab Sample IDs: 2085589, 2085592, 2085595, 2085598

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91515

Included Lab Sample IDs: 2085604, 2085605

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.7	99.8	P/P	90 - 110
Antimony	96.4	96.1	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Boron	102	105	P/P	90 - 110
Cadmium	99.4	99.3	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Lead	94.2	95.2	P/P	90 - 110
Nickel	100	100	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	98.6	98.5	P/P	90 - 110
Thallium	95.8	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91529

Included Lab Sample IDs: 2085598

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91542

Included Lab Sample IDs: 2085604, 2085605

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

Reference Method: SM 2320 B-97

Run ID: A91544

Included Lab Sample IDs: 2085588, 2085591, 2085594, 2085597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110
Total Alkalinity	99.8	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91552

Included Lab Sample IDs: 2085589, 2085592, 2085595, 2085598

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91560

Included Lab Sample IDs: 2085589, 2085592, 2085595, 2085598

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

Reference Method: SM 4500 F-C-97

Run ID: A91689

Included Lab Sample IDs: 2085588, 2085591, 2085594, 2085597

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.0	P/P	90 - 110
Fluoride	99.5	100	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						0.720	
EPA 200.7 Rev. 4.4	Barium	101	101	101	101			0.0602
	Calcium	109	104	107	107			0.593
	Iron	106	109	106	105			0.571
	Magnesium	113	103	111	110			0.604
	Potassium	102	99.7	106	106			0.566
	Sodium	102	101	103	104			0.473
	Zinc	100	101	101	101			0.163
EPA 200.8 Rev. 5.4	Aluminum	101	99.9	111	108			2.12
	Antimony	101	102	110	107			2.69
	Arsenic	105	103	111	109			1.91
	Boron	101	103	116	114			1.65
	Cadmium	104	104	113	111			1.88
	Chromium	101	99.9	112	110			1.70
	Copper	104	99.4	111	110			0.900
	Lead	93.9	97.0	110	107			3.23
	Nickel	104	100	112	110			1.79
	Selenium	104	101	109	105			4.15
	Silver	103	101	112	110			1.65
	Thallium	101	106	120	116			2.80
EPA 300.0 Rev. 2.1	Chloride	99.0	96.3	96.2			0.0395	
	Sulfate	97.7	97.0	96.5			0.810	
EPA 350.1 Rev. 2.0	Ammonia-N	102	103	104				1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	102	102				0.525
	Kjeldahl Nitrogen	105	107	111				2.03
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	101				0.494
	NO ₂ NO ₃ -N	100	102	100				1.94
EPA 365.1 Rev. 2.0	Total-P	102	92.2	94.3				1.81
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	93.2	94.6				1.49
	O-Phosphate-P	97.4	96.0	98.0				2.06
SM 2120 B	Color (true)	99.0					1.14	
	Color (true)	100					0.443	
SM 2320 B-97	Total Alkalinity	103					0.335	
SM 2540 C-97	TDS						8.21	
SM 4500 F-C-97	Fluoride	97.0	98.3	98.3				0.0
SM 5310 B-00	Organic Carbon	93.4	95.2	99.0				2.29

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2085588, 2085591, 2085594, 2085597
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2085604, 2085605
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2085604, 2085605
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2085588, 2085591, 2085594, 2085597
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2085588, 2085591, 2085594, 2085597
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2085589, 2085592, 2085595, 2085598
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2085589, 2085592, 2085595, 2085598

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2085589, 2085592, 2085595, 2085598
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2085589, 2085592, 2085595, 2085598
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2085590, 2085593, 2085596, 2085599
SM 2120 B / E31780	True Color measured at 450 nm	2085588, 2085591, 2085594, 2085597
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2085588, 2085591, 2085594, 2085597
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2085588, 2085591, 2085594, 2085597
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2085588, 2085591, 2085594, 2085597
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2085588, 2085591, 2085594, 2085597
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2085589, 2085592, 2085595, 2085598

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	05/10/2019			05/10/2019 15:52	Sima Feizi	2085588, 2085591, 2085594, 2085597
EPA 200.7 Rev. 4.4	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/15/2019 16:15	Betina Topolski	2085604
	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/15/2019 16:22	Betina Topolski	2085605
EPA 200.8 Rev. 5.4	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/15/2019 21:24	Robert K Palmer	2085604
	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/15/2019 21:34	Robert K Palmer	2085605
	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/20/2019 16:46	Robert K Palmer	2085604
	05/10/2019	05/14/2019 13:50	Elliott D. Healy	05/20/2019 16:56	Robert K Palmer	2085605
EPA 300.0 Rev. 2.1	05/10/2019			05/15/2019 15:15	Lipi Saha	2085594
	05/10/2019			05/15/2019 18:41	Lipi Saha	2085588
	05/10/2019			05/15/2019 19:18	Lipi Saha	2085591
	05/10/2019			05/15/2019 19:30	Lipi Saha	2085597
EPA 350.1 Rev. 2.0	05/10/2019			05/16/2019 11:04	Ping Hua	2085595
	05/10/2019			05/16/2019 11:19	Ping Hua	2085592
	05/10/2019			05/16/2019 11:20	Ping Hua	2085598
	05/10/2019			05/16/2019 13:04	Ping Hua	2085589
EPA 351.2 Rev. 2.0	05/10/2019	05/20/2019 11:40	Jhamieka S. Greenwood	05/21/2019 11:00	Joseph Suarez	2085589
	05/10/2019	05/20/2019 11:40	Jhamieka S. Greenwood	05/21/2019 11:04	Joseph Suarez	2085592
	05/10/2019	05/20/2019 11:40	Jhamieka S. Greenwood	05/21/2019 11:06	Joseph Suarez	2085595
	05/10/2019	05/20/2019 11:40	Jhamieka S. Greenwood	05/21/2019 11:14	Joseph Suarez	2085598
EPA 353.2 Rev. 2.0	05/10/2019			05/17/2019 10:59	Beverly Y. Sanders	2085589
	05/10/2019			05/17/2019 11:00	Beverly Y. Sanders	2085592
	05/10/2019			05/17/2019 11:01	Beverly Y. Sanders	2085595
	05/10/2019			05/20/2019 09:36	Beverly Y. Sanders	2085598
EPA 365.1 Rev. 2.0	05/10/2019	05/17/2019 09:23	Adrian Shelby	05/20/2019 15:36	Rosalyn Ballman	2085598
	05/10/2019	05/17/2019 09:23	Adrian Shelby	05/20/2019 15:39	Rosalyn Ballman	2085589
	05/10/2019	05/17/2019 09:23	Adrian Shelby	05/20/2019 15:40	Rosalyn Ballman	2085592
	05/10/2019	05/17/2019 09:23	Adrian Shelby	05/20/2019 15:41	Rosalyn Ballman	2085595
EPA 365.1 Rev. 2.0 dissolved	05/10/2019			05/10/2019 14:36	Jhamieka S. Greenwood	2085590, 2085593
	05/10/2019			05/10/2019 14:49	Jhamieka S. Greenwood	2085596
	05/10/2019			05/10/2019 14:50	Jhamieka S. Greenwood	2085599
SM 2120 B	05/10/2019			05/10/2019 15:06	Blanca Fach	2085588
	05/10/2019			05/10/2019 15:07	Blanca Fach	2085591
	05/10/2019			05/10/2019 15:08	Blanca Fach	2085594
	05/10/2019			05/10/2019 15:12	Blanca Fach	2085597
SM 2320 B-97	05/10/2019			05/18/2019 12:48	Dale L. Simmons	2085588
	05/10/2019			05/18/2019 13:01	Dale L. Simmons	2085591
	05/10/2019			05/18/2019 13:14	Dale L. Simmons	2085594
	05/10/2019			05/18/2019 13:56	Dale L. Simmons	2085597
SM 2540 C-97	05/10/2019			05/14/2019 14:06	Yijie Li	2085588, 2085591, 2085594, 2085597
SM 2540 D-97	05/10/2019			05/14/2019 14:06	Yijie Li	2085588, 2085591, 2085594, 2085597

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	05/10/2019			05/24/2019 21:43	Dale L. Simmons	2085588
	05/10/2019			05/24/2019 21:47	Dale L. Simmons	2085591
	05/10/2019			05/24/2019 22:34	Dale L. Simmons	2085594
	05/10/2019			05/24/2019 22:38	Dale L. Simmons	2085597
SM 5310 B-00	05/10/2019			05/16/2019 02:40	Julia Storbeck	2085589
	05/10/2019			05/16/2019 02:53	Julia Storbeck	2085595
	05/10/2019			05/16/2019 03:06	Julia Storbeck	2085598
	05/10/2019			05/16/2019 12:47	Julia Storbeck	2085592