

Chemical Analysis Report

NW-DIST-2017-08-23-01

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

Event Description: **Freeport/Bay/Washington run WBID 557 646 567 950**
Request ID: **RQ-2017-08-21-15**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
Pensacola, FL 32502-5794
Attn: Michael King

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Certified by: Colin Wright, Program Administrator

Date Certified: 19-SEP-2017 11:00

A handwritten signature in black ink, appearing to read "Colin Wright", is written 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: Magnolia Creek Owls Head Rd

Collection Date/Time: 08/22/2017 10:45

Field ID: G3NW0099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923477	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P330724	
	EPA 300.0 Rev. 2.1	Chloride	2.0		mg Cl/L	P330749	
		Sulfate	2.0		mg SO4/L	P330752	
	SM 2120 B	Color (true)	46		PCU	P330740	
	SM 2320 B-97	Total Alkalinity	0.98	I	mg CaCO3/L	P330857	
	SM 2540 C-97	TDS	20	I	mg/L	P331044	
	SM 2540 D-97	TSS	3	I	mg/L	P331177	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P330960	
1923480	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P331008	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P330784	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.068		mg N/L	P330849	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P330790	
	SM 5310 B-00	Organic Carbon	3.5		mg C/L	P330910	
1923483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P330728	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lafayette Creek Hwy 20

Collection Date/Time: 08/22/2017 11:15

Field ID: G3NW0118

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923478	EPA 180.1 Rev. 2.0	Turbidity	1.6	A	NTU	P330725	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P330749	
		Sulfate	2.6		mg SO4/L	P330752	
	SM 2120 B	Color (true)	47		PCU	P330741	
	SM 2320 B-97	Total Alkalinity	2.3	I	mg CaCO3/L	P330857	
	SM 2540 C-97	TDS	26		mg/L	P331044	
	SM 2540 D-97	TSS	3	I	mg/L	P331177	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P330960	
1923481	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P331008	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P330784	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P330849	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P330790	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P330910	
1923484	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P330728	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Fourmile Creek SR-20

Collection Date/Time: 08/22/2017 11:30

Field ID: G3NW0112

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923479	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P330725	

Field ID: G3NW0112

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923479	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P330749	
		Sulfate	1.8		mg SO4/L	P330752	
	SM 2120 B	Color (true)	73	A	PCU	P330741	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P330857	
	SM 2540 C-97	TDS	26		mg/L	P331044	
	SM 2540 D-97	TSS	3	I	mg/L	P331177	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P330960	
1923482	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P331008	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P330784	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.045		mg N/L	P330849	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P330790	
	SM 5310 B-00	Organic Carbon	6.1		mg C/L	P330910	
1923485	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P330729	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Otter Creek @ Otter Creek Bridge Rd

Collection Date/Time: 08/22/2017 12:00

Field ID: G3NW0133

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923474	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P330724	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P330749	
		Sulfate	3.9		mg SO4/L	P330752	
	SM 2120 B	Color (true)	350		PCU	P330740	
	SM 2320 B-97	Total Alkalinity	2.4	I	mg CaCO3/L	P330857	
	SM 2540 C-97	TDS	78		mg/L	P331044	
	SM 2540 D-97	TSS	5	I	mg/L	P331177	
1923475	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P330960	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.60		mg N/L	P331008	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P330951	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P330849	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P330790	
1923476	SM 5310 B-00	Organic Carbon	27		mg C/L	P330910	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P330728	
1923503	EPA 200.7 Rev. 4.4	Calcium	4.73		mg/L	P330940	
		Iron	2.13E+03		ug/L	P330940	
		Magnesium	1.22		mg/L	P330940	
		Potassium	2.4		mg/L	P330940	
		Sodium	11.3		mg/L	P330940	
		Zinc	5.0	U	ug/L	P330940	
	EPA 200.8 Rev. 5.4	Arsenic	0.81		ug/L	P330940	
		Cadmium	0.020	U	ug/L	P330940	
		Chromium	0.66	I	ug/L	P330940	
		Copper	0.20	U	ug/L	P330940	

Field ID: G3NW0133

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923503	EPA 200.8 Rev. 5.4	Lead	0.53		ug/L	P330940	
		Nickel	0.45	I	ug/L	P330940	
		Silver	0.010	U	ug/L	P330940	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/16/2017.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P330724

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P330725

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P330940

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

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P330940

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P330749

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330752

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331008

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330784

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330951

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330849

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330790

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330728

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330729

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

Reference Method: SM 2120 B
Batch ID: P330740

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
 Batch ID: P330741

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P330857

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

Reference Method: SM 2540 C-97
 Batch ID: P331044

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P331177

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P330960

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P330910

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: P330940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	107		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	101		P	85 - 115
Sodium	99.8		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P330940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	97.3		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	95.7		P	85 - 115
Lead	97.2		P	85 - 115
Nickel	98.1		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330749

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330752

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331008

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: P330784

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330951

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330790

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330728

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330729

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

Reference Method: SM 2320 B-97
Batch ID: P330857

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

Reference Method: SM 4500 F-C-97
Batch ID: P330960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P330910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923927	Calcium	101		P	80 - 120
1923927	Iron	106		P	80 - 120
1923927	Magnesium	104		P	80 - 120
1923927	Potassium	100		P	80 - 120
1923927	Sodium	104		P	80 - 120
1923927	Zinc	98.2		P	80 - 120
1924613	Calcium	101		P	80 - 120
1924613	Iron	106	105	P/P	80 - 120
1924613	Magnesium	104		P	80 - 120
1924613	Potassium	100	101	P/P	80 - 120
1924613	Sodium	99.2		P	80 - 120
1924613	Zinc	97.6	99.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923927	Arsenic	104		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923927	Cadmium	99.5		P	80 - 120
1923927	Chromium	96.8		P	80 - 120
1923927	Copper	92.8		P	80 - 120
1923927	Lead	98.4		P	80 - 120
1923927	Nickel	95.4		P	80 - 120
1923927	Silver	103		P	80 - 120
1924613	Arsenic	105	105	P/P	80 - 120
1924613	Cadmium	99.1	101	P/P	80 - 120
1924613	Chromium	97.0	97.1	P/P	80 - 120
1924613	Copper	93.8	94.0	P/P	80 - 120
1924613	Lead	99.1	99.0	P/P	80 - 120
1924613	Nickel	96.6	96.8	P/P	80 - 120
1924613	Silver	105	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923333	Chloride	96.5		P	90 - 110
1923478	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923333	Sulfate	98.2		P	90 - 110
1923478	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331008

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923364	Ammonia-N	103	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330784

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923481	Kjeldahl Nitrogen	95.0	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1924585	Kjeldahl Nitrogen	97.5	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923408	NO2NO3-N	102	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923481	Total-P	97.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330728

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923340	O-Phosphate-P	94.4	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923485	O-Phosphate-P	96.9	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P330960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923361	Fluoride	100	100	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P330724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923333	Turbidity	4.06	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P330725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923478	Turbidity	1.27	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924613	Calcium	1.19	Spike	P	0 - 20
1924613	Iron	0.533	Spike	P	0 - 20
1924613	Magnesium	0.247	Spike	P	0 - 20
1924613	Potassium	1.07	Spike	P	0 - 20
1924613	Sodium	0.342	Spike	P	0 - 20
1924613	Zinc	2.31	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924613	Arsenic	0.0697	Spike	P	0 - 20
1924613	Cadmium	1.62	Spike	P	0 - 20
1924613	Chromium	0.108	Spike	P	0 - 20
1924613	Copper	0.151	Spike	P	0 - 20
1924613	Lead	0.139	Spike	P	0 - 20
1924613	Nickel	0.230	Spike	P	0 - 20
1924613	Silver	0.507	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923333	Chloride	3.90	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923333	Sulfate	2.52	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923364	Ammonia-N	1.93	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923481	Kjeldahl Nitrogen	0.136	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924585	Kjeldahl Nitrogen	0.427	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923408	NO2NO3-N	0.743	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923481	Total-P	4.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923340	O-Phosphate-P	1.47	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923485	O-Phosphate-P	0.309	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P330740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923392	Color (true)	3.04	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P330741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923479	Color (true)	0.799	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P330857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923578	Total Alkalinity	0.718	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P331044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923578	TDS	2.87	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P330960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923361	Fluoride	0.0	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P330910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923280	Organic Carbon	1.72	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 300.0 Rev. 2.1
Run ID: A78584
Included Lab Sample IDs: 1923474, 1923477, 1923478, 1923479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	95.7	P/P	90 - 110
Chloride	95.7	97.1	P/P	90 - 110
Sulfate	100	96.7	P/P	90 - 110
Sulfate	96.7	97.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A78588
Included Lab Sample IDs: 1923474, 1923477, 1923478, 1923479

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A78589
Included Lab Sample IDs: 1923476, 1923483, 1923484, 1923485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A78592
Included Lab Sample IDs: 1923474, 1923477, 1923478, 1923479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	85 - 115
Color (true)	101	101	P/P	85 - 115
Color (true)	102	102	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A78616
Included Lab Sample IDs: 1923475, 1923480, 1923481, 1923482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	103	P/P	90 - 110
NO2NO3-N	104	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A78617

Included Lab Sample IDs: 1923474, 1923477, 1923478, 1923479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.7	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A78636

Included Lab Sample IDs: 1923480, 1923481, 1923482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	107	P/P	90 - 110
Kjeldahl Nitrogen	106	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A78640

Included Lab Sample IDs: 1923475, 1923480, 1923481, 1923482

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A78656

Included Lab Sample IDs: 1923475, 1923480, 1923481, 1923482

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

Reference Method: SM 4500 F-C-97

Run ID: A78669

Included Lab Sample IDs: 1923474, 1923477, 1923478, 1923479

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A78685

Included Lab Sample IDs: 1923475, 1923480, 1923481, 1923482

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A78686

Included Lab Sample IDs: 1923503

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	95 - 105
Iron	103	103	P/P	95 - 105
Magnesium	103	103	P/P	95 - 105
Potassium	99.4	98.8	P/P	95 - 105
Sodium	99.5	99.8	P/P	95 - 105
Zinc	99.0	101	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A78691

Included Lab Sample IDs: 1923503

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	100	P/P	90 - 110
Cadmium	98.8	98.1	P/P	90 - 110
Chromium	99.1	99.5	P/P	90 - 110
Copper	101	99.3	P/P	90 - 110
Lead	98.8	99.3	P/P	90 - 110
Nickel	99.9	98.4	P/P	90 - 110
Silver	96.9	96.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A78717

Included Lab Sample IDs: 1923475

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.7	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							4.06	
	Turbidity							1.27	
EPA 200.7 Rev. 4.4	Calcium	102		101	101				1.19
	Iron	107		106	106	105			0.533
	Magnesium	104		104	104				0.247
	Potassium	101		100	100	101			1.07
	Sodium	99.8		104	99.2				0.342
	Zinc	102		98.2	97.6	99.9			2.31
EPA 200.8 Rev. 5.4	Arsenic	102		104	105	105			0.0697
	Cadmium	97.3		99.5	99.1	101			1.62
	Chromium	98.0		96.8	97.0	97.1			0.108
	Copper	95.7		92.8	93.8	94.0			0.151
	Lead	97.2		98.4	99.1	99.0			0.139
	Nickel	98.1		95.4	96.6	96.8			0.230
	Silver	103		103	105	105			0.507
EPA 300.0 Rev. 2.1	Chloride	100		96.5	100			3.90	
	Sulfate	101		98.2	101			2.52	
EPA 350.1 Rev. 2.0	Ammonia-N	102		103	100				1.93
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100		95.0	95.2				0.136
	Kjeldahl Nitrogen	104		97.5	98.0				0.427
EPA 353.2 Rev. 2.0	NO2NO3-N	106		102	103				0.743
EPA 365.1 Rev. 2.0	Total-P	99.4		97.5	102				4.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101		94.4	95.8				1.47
	O-Phosphate-P	98.2		96.9	97.2				0.309
SM 2120 B	Color (true)							3.04	
	Color (true)							0.799	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
SM 2320 B-97	Total Alkalinity	108			0.718	
SM 2540 C-97	TDS				2.87	
SM 4500 F-C-97	Fluoride	101	100	100		0.0
SM 5310 B-00	Organic Carbon	99.4				1.72

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1923474, 1923477, 1923478, 1923479
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1923503
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1923503
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1923474, 1923477, 1923478, 1923479
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1923474, 1923477, 1923478, 1923479
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1923475, 1923480, 1923481, 1923482
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1923475, 1923480, 1923481, 1923482
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1923475, 1923480, 1923481, 1923482
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1923475, 1923480, 1923481, 1923482
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1923476, 1923483, 1923484, 1923485
SM 2120 B / E31780	True Color measured at 450 nm	1923474, 1923477, 1923478, 1923479
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1923474, 1923477, 1923478, 1923479
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1923474, 1923477, 1923478, 1923479
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1923474, 1923477, 1923478, 1923479
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1923474, 1923477, 1923478, 1923479
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1923475, 1923480, 1923481, 1923482

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	08/23/2017			08/23/2017 15:45	DeAsia Armster	1923474, 1923477, 1923478, 1923479
EPA 200.7 Rev. 4.4	08/23/2017	08/28/2017	Elliott D. Healy	08/29/2017	Betina Topolski	1923503
EPA 200.8 Rev. 5.4	08/23/2017	08/28/2017	Elliott D. Healy	08/29/2017	Nadine Brooks	1923503
EPA 300.0 Rev. 2.1	08/23/2017			08/24/2017	Julia Storbeck	1923474, 1923477, 1923478, 1923479
EPA 350.1 Rev. 2.0	08/23/2017			08/28/2017	Sofia Elnemr	1923475, 1923480, 1923481, 1923482
EPA 351.2 Rev. 2.0	08/23/2017	08/24/2017	Adrian Shelby	08/25/2017	Joseph Suarez	1923480, 1923481, 1923482
	08/23/2017	08/29/2017	Adrian Shelby	08/30/2017	Joseph Suarez	1923475
EPA 353.2 Rev. 2.0	08/23/2017			08/25/2017	Beverly Y. Sanders	1923475, 1923480, 1923481, 1923482
EPA 365.1 Rev. 2.0	08/23/2017	08/24/2017	Sima Feizi	08/25/2017	Lipi Saha	1923475, 1923480, 1923481, 1923482
EPA 365.1 Rev. 2.0 dissolved	08/23/2017			08/23/2017 14:25	Megan Treadwell	1923485
	08/23/2017			08/23/2017 14:53	Megan Treadwell	1923476
	08/23/2017			08/23/2017 14:54	Megan Treadwell	1923483, 1923484
SM 2120 B	08/23/2017			08/23/2017 16:46	Tanya Welborn	1923477
	08/23/2017			08/23/2017 16:49	Tanya Welborn	1923478
	08/23/2017			08/23/2017 16:51	Tanya Welborn	1923479
	08/23/2017			08/23/2017 17:20	Tanya Welborn	1923474
SM 2320 B-97	08/23/2017			08/25/2017	Dale L. Simmons	1923474, 1923477, 1923478, 1923479
SM 2540 C-97	08/23/2017			08/25/2017	Yijie Li	1923474, 1923477, 1923478, 1923479
SM 2540 D-97	08/23/2017			08/25/2017	Yijie Li	1923474, 1923477, 1923478, 1923479
SM 4500 F-C-97	08/23/2017			08/29/2017	Dale L. Simmons	1923474, 1923477, 1923478, 1923479
SM 5310 B-00	08/23/2017			08/25/2017	Ping Hua	1923475, 1923480, 1923481, 1923482