

Chemical Analysis Report

CEN-DIST-2017-11-02-01

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

Event Description: **Noname / Hope / Greenwood**

Request ID: **RQ-2017-10-30-50**

Customer: **CEN-DIST**

Project ID: **SMP**

Send Reports to:

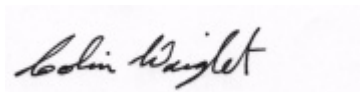
FL Dept. of Environmental Protection
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3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact

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Certified by: Colin Wright, Program Administrator

Date Certified: 29-NOV-2017 14:47

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

Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Greenwood Lake West Lobe @ Center

Collection Date/Time: 11/01/2017 10:35

Field ID: G2CE0112

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942073	EPA 180.1 Rev. 2.0	Turbidity	5.1	A	NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P334716	
		Sulfate	2.6		mg SO4/L	P334718	
	SM 2120 B	Color (true)	62		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	38		mg CaCO3/L	P335154	
	SM 2540 C-97	TDS	97		mg/L	P335220	
	SM 2540 D-97	TSS	5	I	mg/L	P335131	
	SM 4500 F-C-97	Fluoride	0.048	I	mg F/L	P335157	
1942074	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P335282	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P334936	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P334942	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P334759	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P335077	
1942075	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P334598	
1942079	EPA 200.7 Rev. 4.4	Calcium	13.6		mg/L	P334816	
		Iron	100	I	ug/L	P334816	
		Magnesium	2.09		mg/L	P334816	
		Potassium	2.4		mg/L	P334816	
		Sodium	10.3		mg/L	P334816	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P334816	
		Arsenic	0.78		ug/L	P334816	
		Cadmium	0.020	U	ug/L	P334816	
		Chromium	0.40	U	ug/L	P334816	
		Copper	1.32		ug/L	P334816	
		Lead	0.050	U	ug/L	P334816	
		Nickel	0.20	U	ug/L	P334816	
		Silver	0.010	U	ug/L	P334816	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Lake Hope @ Center

Collection Date/Time: 11/01/2017 12:20

Field ID: G2CE0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942067	EPA 180.1 Rev. 2.0	Turbidity	0.55		NTU	P334606	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P334716	
		Sulfate	19		mg SO4/L	P334718	
	SM 2120 B	Color (true)	26		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	38		mg CaCO3/L	P335154	
	SM 2540 C-97	TDS	144	A	mg/L	P335220	
	SM 2540 D-97	TSS	2	IA	mg/L	P335131	
	SM 4500 F-C-97	Fluoride	0.071	I	mg F/L	P335157	
1942069	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P335282	

Field ID: G2CE0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942069	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P334936	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P334942	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P334759	
	SM 5310 B-00	Organic Carbon	6.1		mg C/L	P335077	
1942071	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P334598	

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: Noname Lake @ Center

Collection Date/Time: 11/01/2017 13:10

Field ID: G2CE0068

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942068	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P334716	
		Sulfate	10		mg SO4/L	P334718	
		Color (true)	22		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P335154	
	SM 2540 C-97	TDS	73		mg/L	P335220	
	SM 2540 D-97	TSS	3	I	mg/L	P335131	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335157	
1942070	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P335282	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P334936	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P334942	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P334759	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P335077	
1942072	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P334598	

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: P334586

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P334606

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P334816

Component	Result	Code	Units
Calcium	0.075	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334816

Component	Result	Code	Units
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: P334816

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: P334716

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335282

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

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

Reference Method: SM 2120 B
Batch ID: P334650

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P335154

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

Reference Method: SM 2540 C-97
Batch ID: P335220

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P335131

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P335157

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P335077

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: P334816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.5		P	85 - 115
Sodium	100		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	104		P	85 - 115
Copper	98.3		P	85 - 115
Lead	95.7		P	85 - 115
Nickel	101		P	85 - 115
Silver	97.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334716

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335282

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

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: P334942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	102		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.4		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P335154

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P335157

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P335077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941925	Calcium	101		P	80 - 120
1941925	Iron	105		P	80 - 120
1941925	Magnesium	101		P	80 - 120
1941925	Potassium	99.9		P	80 - 120
1941925	Sodium	103		P	80 - 120
1941925	Zinc	100		P	80 - 120
1942789	Iron	104	103	P/P	80 - 120
1942789	Magnesium	100		P	80 - 120
1942789	Potassium	99.1	100	P/P	80 - 120
1942789	Sodium	101		P	80 - 120
1942789	Zinc	97.3	96.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941925	Arsenic	104		P	80 - 120
1941925	Cadmium	107		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941925	Chromium	102		P	80 - 120
1941925	Copper	96.4		P	80 - 120
1941925	Lead	95.5		P	80 - 120
1941925	Nickel	97.4		P	80 - 120
1941925	Silver	96.8		P	80 - 120
1942789	Arsenic	106	99.0	P/P	80 - 120
1942789	Cadmium	107	100	P/P	80 - 120
1942789	Chromium	103	96.9	P/P	80 - 120
1942789	Copper	94.0	88.0	P/P	80 - 120
1942789	Lead	96.8	89.7	P/P	80 - 120
1942789	Nickel	98.3	91.2	P/P	80 - 120
1942789	Silver	97.4	90.9	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334716

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941950	Chloride	94.5		P	90 - 110
1942068	Chloride	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941950	Sulfate	94.7		P	90 - 110
1942068	Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942069	Ammonia-N	93.5	91.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942089	Kjeldahl Nitrogen	93.6	88.4	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941957	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942087	Total-P	98.0	97.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941942	O-Phosphate-P	93.1	95.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P335157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941802	Fluoride	97.8	98.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P335077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941958	Organic Carbon	93.6	95.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P334586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942073	Turbidity	3.13	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P334606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941946	Turbidity	2.69	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942789	Calcium	0.811	Spike	P	0 - 20
1942789	Iron	0.648	Spike	P	0 - 20
1942789	Magnesium	0.810	Spike	P	0 - 20
1942789	Potassium	0.854	Spike	P	0 - 20
1942789	Sodium	1.42	Spike	P	0 - 20
1942789	Zinc	0.523	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942789	Arsenic	6.58	Spike	P	0 - 20
1942789	Cadmium	6.74	Spike	P	0 - 20
1942789	Chromium	5.61	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942789	Copper	6.47	Spike	P	0 - 20
1942789	Lead	7.56	Spike	P	0 - 20
1942789	Nickel	7.38	Spike	P	0 - 20
1942789	Silver	6.82	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941950	Chloride	0.457	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941950	Sulfate	0.958	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942069	Ammonia-N	1.69	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942089	Kjeldahl Nitrogen	4.60	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941957	NO2NO3-N	0.344	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942087	Total-P	0.900	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P334598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941942	O-Phosphate-P	1.81	Spike	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P334650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941953	Color (true)	12.9	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P335154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941802	Total Alkalinity	0.694	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
 Batch ID: P335220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942067	TDS	6.94	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P335157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941802	Fluoride	0.484	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
 Batch ID: P335077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941958	Organic Carbon	1.53	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 180.1 Rev. 2.0
 Run ID: A80005
 Included Lab Sample IDs: 1942068, 1942073

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A80009

Included Lab Sample IDs: 1942071, 1942072, 1942075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	95.7	96.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A80015

Included Lab Sample IDs: 1942067

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

Reference Method: SM 2120 B

Run ID: A80027

Included Lab Sample IDs: 1942067, 1942068, 1942073

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A80039

Included Lab Sample IDs: 1942067, 1942068, 1942073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.8	P/P	90 - 110
Chloride	99.4	100	P/P	90 - 110
Sulfate	98.6	99.3	P/P	90 - 110
Sulfate	99.3	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80097

Included Lab Sample IDs: 1942069, 1942070, 1942074

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80129

Included Lab Sample IDs: 1942069, 1942070, 1942074

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: A80140

Included Lab Sample IDs: 1942079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	107	106	P/P	90 - 110
Cadmium	106	107	P/P	90 - 110
Chromium	106	106	P/P	90 - 110
Copper	104	103	P/P	90 - 110
Lead	97.9	97.9	P/P	90 - 110
Silver	97.2	98.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A80141

Included Lab Sample IDs: 1942079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	100	99.7	P/P	90 - 110
Potassium	98.7	99.0	P/P	90 - 110
Sodium	98.7	99.7	P/P	90 - 110
Zinc	101	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A80183

Included Lab Sample IDs: 1942079

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

Reference Method: SM 5310 B-00

Run ID: A80188

Included Lab Sample IDs: 1942069, 1942070, 1942074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.5	96.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A80221

Included Lab Sample IDs: 1942067, 1942068, 1942073

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

Reference Method: SM 4500 F-C-97

Run ID: A80221

Included Lab Sample IDs: 1942067, 1942068, 1942073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80261

Included Lab Sample IDs: 1942069, 1942070, 1942074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	96.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80262

Included Lab Sample IDs: 1942069, 1942070, 1942074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	99.0	P/P	90 - 110
Ammonia-N	99.0	98.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

* 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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.13	
	Turbidity						2.69	
EPA 200.7 Rev. 4.4	Calcium	102	101					0.811
	Iron	105	105	104	103			0.648
	Magnesium	102	101	100				0.810
	Potassium	99.5	99.9	99.1	100			0.854
	Sodium	100	103	101				1.42
	Zinc	101	100	97.3	96.7			0.523
EPA 200.8 Rev. 5.4	Arsenic	104	104	106	99.0			6.58
	Cadmium	107	107	107	100			6.74
	Chromium	104	102	103	96.9			5.61
	Copper	98.3	96.4	94.0	88.0			6.47
	Lead	95.7	95.5	96.8	89.7			7.56
	Nickel	101	97.4	98.3	91.2			7.38
	Silver	97.2	96.8	97.4	90.9			6.82
EPA 300.0 Rev. 2.1	Chloride	95.1	94.5	94.6			0.457	
	Sulfate	95.7	94.7	95.7			0.958	
EPA 350.1 Rev. 2.0	Ammonia-N	101	93.5	91.8				1.69
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	93.6	88.4				4.60
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	103	102				0.344
EPA 365.1 Rev. 2.0	Total-P	101	98.0	97.0				0.900
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.4	93.1	95.2				1.81
SM 2120 B	Color (true)						12.9	
SM 2320 B-97	Total Alkalinity	103					0.694	
SM 2540 C-97	TDS						6.94	
SM 4500 F-C-97	Fluoride	94.9	97.8	98.4				0.484
SM 5310 B-00	Organic Carbon	96.4	93.6	95.5				1.53

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1942067, 1942068, 1942073
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1942079
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1942079
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1942067, 1942068, 1942073
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1942067, 1942068, 1942073
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1942069, 1942070, 1942074
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1942069, 1942070, 1942074
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1942069, 1942070, 1942074

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	1942069, 1942070, 1942074
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1942071, 1942072, 1942075
SM 2120 B / E31780	True Color measured at 450 nm	1942067, 1942068, 1942073
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1942067, 1942068, 1942073
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1942067, 1942068, 1942073
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1942067, 1942068, 1942073
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1942067, 1942068, 1942073
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1942069, 1942070, 1942074

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	11/02/2017			11/02/2017 17:33	DeAsia Armster	1942068, 1942073
	11/02/2017			11/03/2017 09:38	DeAsia Armster	1942067
EPA 200.7 Rev. 4.4	11/02/2017	11/07/2017	Elliott D. Healy	11/08/2017	Betina Topolski	1942079
EPA 200.8 Rev. 5.4	11/02/2017	11/07/2017	Elliott D. Healy	11/08/2017	Nadine Brooks	1942079
	11/02/2017	11/07/2017	Elliott D. Healy	11/09/2017	Robert K Palmer	1942079
EPA 300.0 Rev. 2.1	11/02/2017			11/03/2017	Irina Carbone	1942067, 1942068
	11/02/2017			11/04/2017	Irina Carbone	1942073
EPA 350.1 Rev. 2.0	11/02/2017			11/14/2017	Sofia Elnemr	1942069, 1942070, 1942074
EPA 351.2 Rev. 2.0	11/02/2017	11/08/2017	Adrian Shelby	11/14/2017	Tanya Welborn	1942069, 1942070, 1942074
EPA 353.2 Rev. 2.0	11/02/2017			11/08/2017	Beverly Y. Sanders	1942069, 1942070, 1942074
EPA 365.1 Rev. 2.0	11/02/2017	11/06/2017	Sima Feizi	11/07/2017	Lipi Saha	1942069, 1942070, 1942074
EPA 365.1 Rev. 2.0 dissolved	11/02/2017			11/02/2017 13:49	Megan Treadwell	1942071
	11/02/2017			11/02/2017 13:50	Megan Treadwell	1942072, 1942075
SM 2120 B	11/02/2017			11/02/2017 14:59	Tanya Welborn	1942067
	11/02/2017			11/02/2017 15:00	Tanya Welborn	1942068
	11/02/2017			11/02/2017 15:01	Tanya Welborn	1942073
SM 2320 B-97	11/02/2017			11/09/2017	Dale L. Simmons	1942067, 1942068, 1942073
SM 2540 C-97	11/02/2017			11/06/2017	Yijie Li	1942067, 1942068, 1942073
SM 2540 D-97	11/02/2017			11/06/2017	Yijie Li	1942067, 1942068, 1942073
SM 4500 F-C-97	11/02/2017			11/09/2017	Dale L. Simmons	1942067, 1942068, 1942073
SM 5310 B-00	11/02/2017			11/10/2017	Ping Hua	1942069, 1942070, 1942074