

Chemical Analysis Report

CEN-DIST-2018-09-20-01

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

Event Description: **Lk Winnemissett + LVI**
Request ID: **RQ-2018-09-17-64**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 18-OCT-2018 14:18



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: Lake Winnemissett @ Center

Collection Date/Time: 09/19/2018 11:30

Field ID: G2CE0184

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2026829	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P352026	
	EPA 300.0 Rev. 2.1	Chloride	27	A	mg Cl/L	P352353	
		Sulfate	22	A	mg SO4/L	P352356	
	SM 2120 B	Color (true)	5.2	I	PCU	P352005	
	SM 2320 B-97	Total Alkalinity	6.0	A	mg CaCO3/L	P352178	
	SM 2540 C-97	TDS	84	A	mg/L	P352860	
	SM 2540 D-97	TSS	2	UA	mg/L	P352251	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P352568	
2026830	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P352535	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P352156	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352212	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P352086	
	SM 5310 B-00	Organic Carbon	3.9		mg C/L	P352262	
2026831	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352012	
2026834	EPA 200.7 Rev. 4.4	Calcium	8.79		mg/L	P352015	
		Iron	30	U	ug/L	P352015	
		Magnesium	2.19		mg/L	P352015	
		Potassium	1.8		mg/L	P352015	
		Sodium	17.6		mg/L	P352015	
		Zinc	6.1	I	ug/L	P352015	
	EPA 200.8 Rev. 5.4	Arsenic	1.15		ug/L	P352015	
		Cadmium	0.020	U	ug/L	P352015	
		Chromium	0.40	U	ug/L	P352015	
		Copper	0.20	U	ug/L	P352015	
		Lead	0.050	U	ug/L	P352015	
		Nickel	0.20	U	ug/L	P352015	
		Silver	0.010	U	ug/L	P352662	

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: P352026

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352015

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: P352015

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352662

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352353

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352356

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352535

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352156

Component	Result	Code	Units
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Quality Assurance Report

Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352156

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352212

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352086

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352012

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

Reference Method: SM 2120 B
Batch ID: P352005

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P352178

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

Reference Method: SM 2540 C-97
Batch ID: P352860

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P352251

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P352568

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P352262

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: P352015

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	112		P	85 - 115
Iron	112		P	85 - 115
Magnesium	114		P	85 - 115
Potassium	108		P	85 - 115
Sodium	109		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352015

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	96.7		P	85 - 115
Copper	99.2		P	85 - 115
Lead	95.8		P	85 - 115
Nickel	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352662

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	98.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352353

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352356

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352535

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352156

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352212

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

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352212

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352086

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: P352012

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P352005

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.6		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P352178

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P352568

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352262

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352015

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026324	Calcium	101		P	80 - 120
2026324	Iron	107		P	80 - 120
2026324	Magnesium	107		P	80 - 120
2026324	Potassium	100		P	80 - 120
2026324	Sodium	98.1		P	80 - 120
2026324	Zinc	102		P	80 - 120
2026566	Calcium	106	104	P/P	80 - 120
2026566	Iron	107	104	P/P	80 - 120
2026566	Magnesium	109	107	P/P	80 - 120
2026566	Potassium	104	101	P/P	80 - 120
2026566	Sodium	104	99.6	P/P	80 - 120
2026566	Zinc	99.1	97.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352015

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026324	Arsenic	106		P	80 - 120
2026324	Cadmium	102		P	80 - 120
2026324	Chromium	96.2		P	80 - 120
2026324	Copper	99.7		P	80 - 120
2026324	Lead	99.6		P	80 - 120
2026324	Nickel	99.0		P	80 - 120
2026566	Arsenic	100	99.7	P/P	80 - 120
2026566	Cadmium	99.7	97.5	P/P	80 - 120
2026566	Chromium	96.3	96.5	P/P	80 - 120
2026566	Copper	98.0	97.7	P/P	80 - 120
2026566	Lead	96.5	96.0	P/P	80 - 120
2026566	Nickel	97.5	97.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352662

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026444	Silver	98.0	98.1	P/P	80 - 120
2026834	Silver	97.7		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352353

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026829	Chloride	99.5		P	90 - 110
2026923	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352356

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026829	Sulfate	98.3		P	90 - 110
2026923	Sulfate	98.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026830	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352156

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026830	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026738	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026830	Total-P	99.9	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352012

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026679	O-Phosphate-P	96.6	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P352568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026829	Fluoride	104	104	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2026663	Organic Carbon	94.4	95.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026918	Turbidity	6.87	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026566	Calcium	2.20	Spike	P	0 - 20
2026566	Iron	2.36	Spike	P	0 - 20
2026566	Magnesium	2.03	Spike	P	0 - 20
2026566	Potassium	2.44	Spike	P	0 - 20
2026566	Sodium	3.32	Spike	P	0 - 20
2026566	Zinc	1.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026566	Arsenic	0.449	Spike	P	0 - 20
2026566	Cadmium	2.24	Spike	P	0 - 20
2026566	Chromium	0.197	Spike	P	0 - 20
2026566	Copper	0.296	Spike	P	0 - 20
2026566	Lead	0.522	Spike	P	0 - 20
2026566	Nickel	0.0183	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026444	Silver	0.148	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352353

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026829	Chloride	0.821	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026829	Sulfate	0.623	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026830	Ammonia-N	1.75	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026830	Kjeldahl Nitrogen	2.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026738	NO2NO3-N	0.962	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026830	Total-P	4.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026679	O-Phosphate-P	0.439	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P352005

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026918	Color (true)	1.88	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P352178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026829	Total Alkalinity	0.246	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P352860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026829	TDS	5.99	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P352568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026829	Fluoride	0.482	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P352262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2026663	Organic Carbon	0.864	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: A86617
Included Lab Sample IDs: 2026829

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	107	106	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A86618
Included Lab Sample IDs: 2026831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	97.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A86622
Included Lab Sample IDs: 2026829

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	103	102	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A86655
Included Lab Sample IDs: 2026834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	99.3	101	P/P	90 - 110
Zinc	98.5	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A86689
Included Lab Sample IDs: 2026829

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86701
Included Lab Sample IDs: 2026830

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86708
Included Lab Sample IDs: 2026830

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86710

Included Lab Sample IDs: 2026830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86718

Included Lab Sample IDs: 2026829

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	99.9	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A86723

Included Lab Sample IDs: 2026830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.6	94.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86804

Included Lab Sample IDs: 2026834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.6	98.1	P/P	90 - 110
Cadmium	95.4	96.8	P/P	90 - 110
Copper	95.6	96.9	P/P	90 - 110
Lead	95.2	96.9	P/P	90 - 110
Nickel	95.4	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86823

Included Lab Sample IDs: 2026830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	99.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86828

Included Lab Sample IDs: 2026834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	94.9	95.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A86829

Included Lab Sample IDs: 2026829

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86934

Included Lab Sample IDs: 2026834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	92.0	94.5	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					6.87	
EPA 200.7 Rev. 4.4	Calcium	112	101	106	104		2.20
	Iron	112	107	107	104		2.36
	Magnesium	114	107	109	107		2.03
	Potassium	108	100	104	101		2.44
	Sodium	109	98.1	104	99.6		3.32
	Zinc	102	102	99.1	97.9		1.24
EPA 200.8 Rev. 5.4	Arsenic	101	106	100	99.7		0.449
	Cadmium	100	102	99.7	97.5		2.24
	Chromium	96.7	96.2	96.3	96.5		0.197
	Copper	99.2	99.7	98.0	97.7		0.296
	Lead	95.8	99.6	96.5	96.0		0.522
	Nickel	100	99.0	97.5	97.4		0.0183
	Silver	98.2	98.0	98.1	97.7		0.148
EPA 300.0 Rev. 2.1	Chloride	99.1	99.5	99.9		0.821	
	Sulfate	98.0	98.3	98.7		0.623	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	102	104			1.75
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	100	103			2.21
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	102			0.962
EPA 365.1 Rev. 2.0	Total-P	101	99.9	104			4.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.6	97.1			0.439
SM 2120 B	Color (true)	97.6				1.88	
SM 2320 B-97	Total Alkalinity	102				0.246	
SM 2540 C-97	TDS					5.99	
SM 4500 F-C-97	Fluoride	99.3	104	104			0.482
SM 5310 B-00	Organic Carbon	95.8	94.4	95.2			0.864

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2026829
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2026834
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2026834
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2026829
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2026829
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2026830
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2026830
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2026830
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2026830
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2026831
SM 2120 B / E31780	True Color measured at 450 nm	2026829
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2026829
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2026829
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2026829
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2026829

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2026830

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	09/20/2018			09/20/2018 16:37	Megan Treadwell	2026829
EPA 200.7 Rev. 4.4	09/20/2018	09/20/2018 17:45	Elliott D. Healy	09/21/2018 20:17	Betina Topolski	2026834
EPA 200.8 Rev. 5.4	09/20/2018	09/20/2018 17:45	Elliott D. Healy	10/01/2018 05:03	Robert K Palmer	2026834
	09/20/2018	09/20/2018 17:45	Elliott D. Healy	10/01/2018 18:07	Robert K Palmer	2026834
	09/20/2018	10/03/2018 12:17	Devin Thornton	10/04/2018 23:32	Robert K Palmer	2026834
EPA 300.0 Rev. 2.1	09/20/2018			09/26/2018 21:43	Lipi Saha	2026829
EPA 350.1 Rev. 2.0	09/20/2018			09/27/2018 11:35	Ping Hua	2026830
EPA 351.2 Rev. 2.0	09/20/2018	09/24/2018 11:40	Adrian Shelby	09/25/2018 13:23	Joseph Suarez	2026830
EPA 353.2 Rev. 2.0	09/20/2018			09/25/2018 14:24	Lauren Bottorf	2026830
EPA 365.1 Rev. 2.0	09/20/2018	09/21/2018 12:45	Sima Feizi	09/25/2018 09:20	Beverly Y. Sanders	2026830
EPA 365.1 Rev. 2.0 dissolved	09/20/2018			09/20/2018 16:33	Julia Storbeck	2026831
SM 2120 B	09/20/2018			09/20/2018 15:26	DeAsia Armster	2026829
SM 2320 B-97	09/20/2018			09/21/2018 22:27	Dale L. Simmons	2026829
SM 2540 C-97	09/20/2018			09/24/2018 15:00	DeAsia Armster	2026829
SM 2540 D-97	09/20/2018			09/24/2018 15:00	DeAsia Armster	2026829
SM 4500 F-C-97	09/20/2018			09/28/2018 09:52	Dale L. Simmons	2026829
SM 5310 B-00	09/20/2018			09/25/2018 20:06	Megan Treadwell	2026830