

Chemical Analysis Report

CEN-DIST-2023-06-02-01

Florida DEP Laboratory
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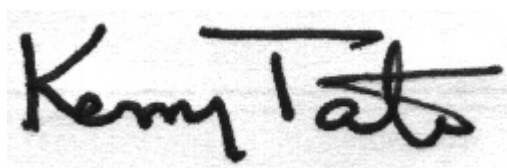
Event Description: **Run 11 Plus Lorna Doone LVI**
Request ID: **RQ-2023-05-29-21**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 22-JUN-2023 10:26

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: LAKE WALKER AT CENTER

Collection Date/Time: 06/01/2023 10:49

Field ID: G4CE0238

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2414251	DEP SOP: NU-094-1	Color (true)	23		PCU	P430747	
	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P430750	
	EPA 300.0 Rev. 2.1	Chloride	7.2		mg Cl/L	P430960	
		Sulfate	0.63		mg SO4/L	P430964	
	SM 2320 B-2011	Total Alkalinity	50		mg CaCO3/L	P431028	
	SM 2540 C-2015	TDS	104		mg/L	P431083	
	SM 2540 D-2015	TSS	18	I	mg/L	P431069	
	SM 4500-F- C-2011	Fluoride	0.055	I	mg F/L	P431429	
2414253	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P430851	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P431037	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431073	
	EPA 365.1 Rev. 2.0	Total-P	0.087		mg P/L	P430796	
	SM 5310 B-2011	Organic Carbon	8.4		mg C/L	P430954	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated because of sample matrix interference.

Sample Location: LAKE CATHERINE AT CENTER

Collection Date/Time: 06/01/2023 11:35

Field ID: G4CE0240

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2414260	EPA 200.7 Rev. 4.4	Calcium	23.3		mg/L	P430809	
		Iron	30	U	ug/L	P430809	
		Magnesium	2.51		mg/L	P430809	
		Potassium	1.1	I	mg/L	P430809	
		Sodium	7.5		mg/L	P430809	
		Strontium	62.0		ug/L	P430809	
		Tin	3.0	U	ug/L	P430809	
		Titanium	0.75	U	ug/L	P430809	
		Vanadium	2.0	U	ug/L	P430809	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P430809	
		Aluminum	14	I	ug/L	P430809	
		Antimony	0.69		ug/L	P430809	
		Arsenic	0.77		ug/L	P430809	
		Barium	10.9		ug/L	P430809	
		Beryllium	0.010	U	ug/L	P430809	
		Boron	39.4		ug/L	P430809	
		Cadmium	0.020	U	ug/L	P430809	
		Chromium	0.40	U	ug/L	P430809	
		Cobalt	0.020	U	ug/L	P430809	
		Copper	0.75	I	ug/L	P430809	
		Lead	0.20	U	ug/L	P430809	
		Manganese	3.17		ug/L	P430809	
		Molybdenum	1.04		ug/L	P430809	
		Nickel	0.50	U	ug/L	P430809	
		Selenium	0.20	U	ug/L	P430809	
		Silver	0.010	U	ug/L	P430809	
		Thallium	0.10	U	ug/L	P430809	
	SM 2340 B-2011	Hardness	68.6		mg/L	P430809	

Sample Location: LAKE JANE AT CENTER

Collection Date/Time: 06/01/2023 12:13

Field ID: G4CE0152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2414252	DEP SOP: NU-094-1	Color (true)	30	A	PCU	P430747	
	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P430750	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P430960	
		Sulfate	13		mg SO4/L	P430964	
	SM 2320 B-2011	Total Alkalinity	49		mg CaCO3/L	P431028	
	SM 2540 C-2015	TDS	110		mg/L	P431083	
	SM 2540 D-2015	TSS	6	I	mg/L	P431069	
	SM 4500-F- C-2011	Fluoride	0.085	I	mg F/L	P431429	
2414254	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P430851	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P431037	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431075	
	EPA 365.1 Rev. 2.0	Total-P	0.090		mg P/L	P430796	
	SM 5310 B-2011	Organic Carbon	8.9		mg C/L	P430954	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: LAKE LOTTA AT CENTER OF SOUTHERN LOBE

Collection Date/Time: 06/01/2023 09:53

Field ID: G2CE0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2414248	DEP SOP: NU-094-1	Color (true)	54		PCU	P430746	
	EPA 180.1 Rev. 2.0	Turbidity	3.3	A	NTU	P430750	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P430960	
		Sulfate	15		mg SO4/L	P430964	
	SM 2320 B-2011	Total Alkalinity	49		mg CaCO3/L	P431028	
	SM 2540 C-2015	TDS	130	A	mg/L	P431083	
	SM 2540 D-2015	TSS	5	IA	mg/L	P431069	
	SM 4500-F- C-2011	Fluoride	0.11		mg F/L	P431429	
2414249	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P430851	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P431037	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431073	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P430796	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P430954	
2414250	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P430739	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P430746

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P430747

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430750

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430809

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
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430809

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430960

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430964

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430851

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431037

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431073

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431075

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430796

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430739

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

Reference Method: SM 2320 B-2011
Batch ID: P431028

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2015
Batch ID: P431083

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P431069

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P431429

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P430954

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P430746

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.5		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P430747

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.7		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430750

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430809

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	101		P	85 - 115
Sodium	96.3		P	85 - 115
Strontium	99.5		P	85 - 115
Tin	101		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430809

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.8		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	98.8		P	85 - 115
Barium	103		P	85 - 115
Beryllium	97.0		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	95.7		P	85 - 115
Cobalt	99.4		P	85 - 115
Copper	96.8		P	85 - 115
Lead	100		P	85 - 115
Manganese	96.1		P	85 - 115
Molybdenum	97.1		P	85 - 115
Nickel	96.8		P	85 - 115
Selenium	99.1		P	85 - 115
Silver	103		P	85 - 115
Thallium	95.2		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430851

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431037

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: P431073

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431075

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: P430796

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: P430739

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

Reference Method: SM 2320 B-2011
Batch ID: P431028

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	92 - 105

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 C-2015
Batch ID: P431083

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

Reference Method: SM 2540 D-2015
Batch ID: P431069

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	96.9		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P431429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P430954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P430809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414260	Calcium	99.3		P	80 - 120
2414260	Iron	94.6	102	P/P	80 - 120
2414260	Magnesium	92.8	105	P/P	80 - 120
2414260	Potassium	96.0	104	P/P	80 - 120
2414260	Sodium	97.4		P	80 - 120
2414260	Strontium	93.4	101	P/P	80 - 120
2414260	Tin	93.1	102	P/P	80 - 120
2414260	Titanium	92.9	100	P/P	80 - 120
2414260	Vanadium	91.7	99.5	P/P	80 - 120
2414260	Zinc	92.0	100	P/P	80 - 120
2414410	Calcium	101		P	80 - 120
2414410	Iron	103		P	80 - 120
2414410	Magnesium	102		P	80 - 120
2414410	Potassium	105		P	80 - 120
2414410	Sodium	104		P	80 - 120
2414410	Strontium	101		P	80 - 120
2414410	Tin	101		P	80 - 120
2414410	Titanium	101		P	80 - 120
2414410	Vanadium	102		P	80 - 120
2414410	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P430809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414260	Aluminum	97.5	97.8	P/P	80 - 120
2414260	Antimony	105	105	P/P	80 - 120
2414260	Arsenic	99.3	99.5	P/P	80 - 120
2414260	Barium	102	102	P/P	80 - 120
2414260	Beryllium	96.1	94.5	P/P	80 - 120
2414260	Boron	98.4	99.8	P/P	80 - 120
2414260	Cadmium	100	102	P/P	80 - 120
2414260	Chromium	94.3	95.0	P/P	80 - 120
2414260	Cobalt	97.8	98.0	P/P	80 - 120
2414260	Copper	95.7	95.0	P/P	80 - 120
2414260	Lead	102	102	P/P	80 - 120
2414260	Manganese	94.8	95.2	P/P	80 - 120
2414260	Molybdenum	98.5	98.6	P/P	80 - 120
2414260	Nickel	95.4	95.8	P/P	80 - 120
2414260	Selenium	99.3	100	P/P	80 - 120
2414260	Silver	103	103	P/P	80 - 120
2414260	Thallium	97.3	99.5	P/P	80 - 120
2414410	Aluminum	97.5		P	80 - 120
2414410	Antimony	103		P	80 - 120
2414410	Arsenic	97.4		P	80 - 120
2414410	Barium	102		P	80 - 120
2414410	Beryllium	94.5		P	80 - 120
2414410	Boron	101		P	80 - 120
2414410	Cadmium	100		P	80 - 120
2414410	Chromium	97.8		P	80 - 120
2414410	Cobalt	97.6		P	80 - 120
2414410	Copper	95.9		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414410	Lead	103		P	80 - 120
2414410	Manganese	98.9		P	80 - 120
2414410	Molybdenum	96.5		P	80 - 120
2414410	Nickel	97.4		P	80 - 120
2414410	Selenium	97.7		P	80 - 120
2414410	Silver	102		P	80 - 120
2414410	Thallium	98.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413402	Chloride	103		P	90 - 110
2414251	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413402	Sulfate	96.9		P	90 - 110
2414251	Sulfate	98.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414249	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414191	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414166	NO2NO3-N	94.8	94.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414254	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414189	Total-P	102	103	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414072	O-Phosphate-P	97.5	97.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P431429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414566	Fluoride	103	103	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P430954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414134	Organic Carbon	94.2	96.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P430746

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414182	Color (true)	4.80	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P430747

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414252	Color (true)	0.316	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430750

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414248	Turbidity	17.5	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414260	Calcium	7.03	Spike	P	0 - 20
2414260	Iron	7.59	Spike	P	0 - 20
2414260	Magnesium	7.74	Spike	P	0 - 20
2414260	Potassium	6.39	Spike	P	0 - 20
2414260	Sodium	7.71	Spike	P	0 - 20
2414260	Strontium	7.21	Spike	P	0 - 20
2414260	Tin	9.03	Spike	P	0 - 20
2414260	Titanium	7.48	Spike	P	0 - 20
2414260	Vanadium	8.12	Spike	P	0 - 20
2414260	Zinc	8.47	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414260	Aluminum	0.304	Spike	P	0 - 20
2414260	Antimony	0.461	Spike	P	0 - 20
2414260	Arsenic	0.228	Spike	P	0 - 20
2414260	Barium	0.115	Spike	P	0 - 20
2414260	Beryllium	1.61	Spike	P	0 - 20
2414260	Boron	0.999	Spike	P	0 - 20
2414260	Cadmium	1.64	Spike	P	0 - 20
2414260	Chromium	0.740	Spike	P	0 - 20
2414260	Cobalt	0.169	Spike	P	0 - 20
2414260	Copper	0.761	Spike	P	0 - 20
2414260	Lead	0.542	Spike	P	0 - 20
2414260	Manganese	0.404	Spike	P	0 - 20
2414260	Molybdenum	0.157	Spike	P	0 - 20
2414260	Nickel	0.344	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414260	Selenium	0.937	Spike	P	0 - 20
2414260	Silver	0.299	Spike	P	0 - 20
2414260	Thallium	2.19	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413402	Chloride	1.99	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413402	Sulfate	2.95	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414249	Ammonia-N	0.173	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414191	Kjeldahl Nitrogen	0.111	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414166	NO2NO3-N	0.443	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414254	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P430796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414189	Total-P	0.692	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P430739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414072	O-Phosphate-P	0.477	Spike	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P431028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414186	Total Alkalinity	0.863	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015

Batch ID: P431083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414248	TDS	4.62	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011

Batch ID: P431429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414566	Fluoride	0.503	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011

Batch ID: P430954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414134	Organic Carbon	1.16	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A119549

Included Lab Sample IDs: 2414250

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

Reference Method: DEP SOP: NU-094-1

Run ID: A119551

Included Lab Sample IDs: 2414248, 2414251, 2414252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.5	98.7	P/P	90 - 110
Color (true)	98.7	99.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A119552

Included Lab Sample IDs: 2414248, 2414251, 2414252

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119595

Included Lab Sample IDs: 2414253, 2414254

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119602

Included Lab Sample IDs: 2414249, 2414253, 2414254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A119605

Included Lab Sample IDs: 2414248, 2414251, 2414252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.9	96.1	P/P	90 - 110
Chloride	96.1	96.5	P/P	90 - 110
Sulfate	97.9	98.1	P/P	90 - 110
Sulfate	98.1	98.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119619

Included Lab Sample IDs: 2414260

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.0	98.5	P/P	90 - 110
Antimony	104	103	P/P	90 - 110
Arsenic	99.6	98.5	P/P	90 - 110
Barium	99.9	99.9	P/P	90 - 110
Beryllium	98.2	96.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119619

Included Lab Sample IDs: 2414260

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	97.1	96.0	P/P	90 - 110
Cadmium	98.9	98.7	P/P	90 - 110
Chromium	97.5	97.1	P/P	90 - 110
Cobalt	100	99.3	P/P	90 - 110
Copper	96.1	95.4	P/P	90 - 110
Lead	101	100	P/P	90 - 110
Manganese	97.5	97.0	P/P	90 - 110
Molybdenum	97.9	97.5	P/P	90 - 110
Nickel	97.3	96.1	P/P	90 - 110
Selenium	100	98.4	P/P	90 - 110
Silver	103	102	P/P	90 - 110
Thallium	98.6	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119636

Included Lab Sample IDs: 2414249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.2	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A119648

Included Lab Sample IDs: 2414249, 2414253, 2414254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	97.5	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A119676

Included Lab Sample IDs: 2414248, 2414251, 2414252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119677

Included Lab Sample IDs: 2414260

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	99.2	P/P	90 - 110
Potassium	100	99.1	P/P	90 - 110
Strontium	99.4	99.7	P/P	90 - 110
Tin	101	100	P/P	90 - 110
Titanium	100	100	P/P	90 - 110
Vanadium	99.9	100	P/P	90 - 110
Zinc	100	99.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A119691

Included Lab Sample IDs: 2414249, 2414253, 2414254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	104	P/P	90 - 110
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119727

Included Lab Sample IDs: 2414249, 2414253, 2414254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.6	97.3	P/P	90 - 110
Kjeldahl Nitrogen	99.1	94.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119728

Included Lab Sample IDs: 2414260

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.7	99.0	P/P	95 - 105
Magnesium	99.5	101	P/P	95 - 105
Sodium	97.2	95.9	P/P	95 - 105

Reference Method: SM 4500-F- C-2011

Run ID: A119876

Included Lab Sample IDs: 2414248, 2414251, 2414252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	102	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				
DEP SOP: NU-094-1	Color (true)	99.5				4.80	
	Color (true)	99.7				0.316	
EPA 180.1 Rev. 2.0	Turbidity	99.4				17.5	
EPA 200.7 Rev. 4.4	Calcium	101	99.3	101			7.03
	Iron	102	94.6	102	103		7.59
	Magnesium	101	92.8	105	102		7.74
	Potassium	101	96.0	104	105		6.39
	Sodium	96.3	97.4	104			7.71
	Strontium	99.5	93.4	101	101		7.21
	Tin	101	93.1	102	101		9.03
	Titanium	101	92.9	100	101		7.48
	Vanadium	101	91.7	99.5	102		8.12
	Zinc	102	92.0	100	104		8.47
EPA 200.8 Rev. 5.4	Aluminum	98.8	97.5	97.8	97.5		0.304
	Antimony	104	105	105	103		0.461
	Arsenic	98.8	99.3	99.5	97.4		0.228
	Barium	103	102	102	102		0.115
	Beryllium	97.0	96.1	94.5	94.5		1.61
	Boron	101	98.4	99.8	101		0.999
	Cadmium	99.6	100	102	100		1.64
	Chromium	95.7	94.3	95.0	97.8		0.740
	Cobalt	99.4	97.8	98.0	97.6		0.169
	Copper	96.8	95.7	95.0	95.9		0.761
	Lead	100	102	102	103		0.542
	Manganese	96.1	94.8	95.2	98.9		0.404
	Molybdenum	97.1	98.5	98.6	96.5		0.157
	Nickel	96.8	95.4	95.8	97.4		0.344
	Selenium	99.1	99.3	100	97.7		0.937
	Silver	103	103	103	102		0.299
	Thallium	95.2	97.3	99.5	98.2		2.19
EPA 300.0 Rev. 2.1	Chloride	98.3	103	103		1.99	
	Sulfate	97.0	96.9	98.5		2.95	
EPA 350.1 Rev. 2.0	Ammonia-N	96.6	105	105			0.173
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	102			0.111
EPA 353.2 Rev. 2.0	NO2NO3-N	102	94.8	94.4			0.443
	NO2NO3-N	102	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	101	102	103			0.692
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	97.5	97.0			0.477
SM 2320 B-2011	Total Alkalinity	99.4				0.863	
SM 2540 C-2015	TDS	102				4.62	
SM 2540 D-2015	TSS	96.9					
SM 4500-F- C-2011	Fluoride	98.3	103	103			0.503
SM 5310 B-2011	Organic Carbon	93.0	94.2	96.0			1.16

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2414248, 2414251, 2414252
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2414248, 2414251, 2414252
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2414260
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2414260

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2414248, 2414251, 2414252
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2414248, 2414251, 2414252
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2414249, 2414253, 2414254
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2414249, 2414253, 2414254
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2414249, 2414253, 2414254
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2414249, 2414253, 2414254
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2414250
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2414248, 2414251, 2414252
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2414260
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2414248, 2414251, 2414252
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2414248, 2414251, 2414252
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2414248, 2414251, 2414252
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2414249, 2414253, 2414254

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/02/2023			06/02/2023 15:41	Alexis Price	2414248
	06/02/2023			06/02/2023 15:45	Alexis Price	2414251
	06/02/2023			06/02/2023 15:46	Alexis Price	2414252
EPA 180.1 Rev. 2.0	06/02/2023			06/02/2023 14:03	Alexis Price	2414248
	06/02/2023			06/02/2023 14:05	Alexis Price	2414251
	06/02/2023			06/02/2023 14:06	Alexis Price	2414252
EPA 200.7 Rev. 4.4	06/02/2023	06/05/2023 12:00	George D Taylor	06/09/2023 01:52	McKinley C Carter	2414260
	06/02/2023	06/05/2023 12:00	George D Taylor	06/09/2023 14:21	McKinley C Carter	2414260
EPA 200.8 Rev. 5.4	06/02/2023	06/05/2023 12:00	George D Taylor	06/06/2023 15:23	Conrad Hartmann	2414260
EPA 300.0 Rev. 2.1	06/02/2023			06/07/2023 12:20	James L Waggeberby	2414251
	06/02/2023			06/07/2023 16:06	James L Waggeberby	2414248
	06/02/2023			06/07/2023 16:21	James L Waggeberby	2414252
EPA 350.1 Rev. 2.0	06/02/2023			06/06/2023 12:55	Khloe J Berg	2414249
	06/02/2023			06/06/2023 13:00	Khloe J Berg	2414253
	06/02/2023			06/06/2023 13:02	Khloe J Berg	2414254
EPA 351.2 Rev. 2.0	06/02/2023	06/09/2023 11:22	Ping Hua	06/12/2023 11:38	Samantha L Bates	2414249
	06/02/2023	06/09/2023 11:22	Ping Hua	06/12/2023 11:40	Samantha L Bates	2414253
	06/02/2023	06/09/2023 11:22	Ping Hua	06/12/2023 11:45	Samantha L Bates	2414254
EPA 353.2 Rev. 2.0	06/02/2023			06/09/2023 10:22	Beverly Y. Sanders	2414249
	06/02/2023			06/09/2023 10:23	Beverly Y. Sanders	2414253
	06/02/2023			06/09/2023 10:30	Beverly Y. Sanders	2414254
EPA 365.1 Rev. 2.0	06/02/2023	06/05/2023 14:34	Adam P Silver	06/06/2023 10:52	James L Waggeberby	2414253
	06/02/2023	06/05/2023 14:34	Adam P Silver	06/06/2023 10:53	James L Waggeberby	2414254
	06/02/2023	06/05/2023 14:34	Adam P Silver	06/07/2023 14:36	James L Waggeberby	2414249
EPA 365.1 Rev. 2.0 dissolved SM 2320 B-2011	06/02/2023			06/02/2023 15:21	Elise M. Gillis	2414250
	06/02/2023			06/08/2023 17:36	Chandler E Cox	2414248
	06/02/2023			06/08/2023 17:48	Chandler E Cox	2414251
	06/02/2023			06/08/2023 17:59	Chandler E Cox	2414252
SM 2340 B-2011	06/02/2023			06/09/2023 14:21	McKinley C Carter	2414260
SM 2540 C-2015	06/02/2023			06/06/2023 14:58	Yijie Li	2414248, 2414251, 2414252
SM 2540 D-2015	06/02/2023			06/06/2023 14:58	Yijie Li	2414248, 2414251, 2414252
SM 4500-F- C-2011	06/02/2023			06/16/2023 19:49	Adam P Silver	2414248
	06/02/2023			06/16/2023 19:55	Adam P Silver	2414251
	06/02/2023			06/16/2023 20:00	Adam P Silver	2414252
SM 5310 B-2011	06/02/2023			06/07/2023 18:00	Elise M. Gillis	2414249
	06/02/2023			06/07/2023 18:15	Elise M. Gillis	2414253
	06/02/2023			06/07/2023 18:31	Elise M. Gillis	2414254