Chemical Analysis Report

CEN-DIST-2022-07-26-01

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

Event Description: **Condel, Downey, John's Lake Out**
Request ID: **RQ-2022-07-25-11**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 11-AUG-2022 08:42

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 Downey @ Center **Collection Date/Time: 07/25/2022 12:48**

Field ID: G2CE0227 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2343731	DEP SOP: NU-094-1	Color (true)	24	A	PCU	P417182	
	EPA 180.1 Rev. 2.0	Turbidity	0.85	I	NTU	P417193	
	EPA 300.0 Rev. 2.1	Chloride	24	A	mg Cl/L	P417634	
		Sulfate	4.0	A	mg SO4/L	P417639	
	SM 2320 B-2011	Total Alkalinity	8.2		mg CaCO3/L	P417437	
	SM 2540 C-2011	TDS	78		mg/L	P417660	
	SM 2540 D-2011	TSS	2	I	mg/L	P417663	
	SM 4500-F- C-2011	Fluoride	0.042	I	mg F/L	P417442	
2343732	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P417315	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P417241	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P417309	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P417342	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P417295	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Condel @ Center **Collection Date/Time: 07/25/2022 11:41**

Field ID: G4CE0177 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2343729	DEP SOP: NU-094-1	Color (true)	38		PCU	P417181	
	EPA 180.1 Rev. 2.0	Turbidity	11	A	NTU	P417193	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P417634	
		Sulfate	5.6		mg SO4/L	P417639	
	SM 2320 B-2011	Total Alkalinity	28		mg CaCO3/L	P417437	
	SM 2540 C-2011	TDS	73		mg/L	P417660	
	SM 2540 D-2011	TSS	13		mg/L	P417663	
	SM 4500-F- C-2011	Fluoride	0.043	I	mg F/L	P417442	
2343730	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P417315	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P417241	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P417309	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P417342	
	SM 5310 B-2011	Organic Carbon	9.4		mg C/L	P417295	
2343739	EPA 200.7 Rev. 4.4	Calcium	11.5		mg/L	P417203	
		Iron	44	I	ug/L	P417203	
		Magnesium	1.59		mg/L	P417203	
		Potassium	2.1		mg/L	P417203	
		Sodium	7.1		mg/L	P417203	
		Strontium	27.9		ug/L	P417203	
		Tin	3.0	U	ug/L	P417203	
		Titanium	0.79	I	ug/L	P417203	
		Vanadium	2.0	U	ug/L	P417203	
		Zinc	5.0	U	ug/L	P417203	
	EPA 200.8 Rev. 5.4	Aluminum	74		ug/L	P417203	
		Antimony	0.14	I	ug/L	P417203	
		Arsenic	1.06		ug/L	P417203	
		Barium	6.85		ug/L	P417203	
		Beryllium	0.010	U	ug/L	P417203	
		Boron	46.8		ug/L	P417203	
		Cadmium	0.020	U	ug/L	P417203	
		Chromium	0.40	U	ug/L	P417203	
		Cobalt	0.031	I	ug/L	P417203	
		Copper	0.55	I	ug/L	P417203	
		Lead	0.52		ug/L	P417203	
		Manganese	14.8		ug/L	P417203	
		Molybdenum	0.24	I	ug/L	P417203	
		Nickel	0.50	U	ug/L	P417203	
		Selenium	0.20	U	ug/L	P417203	
		Silver	0.010	U	ug/L	P417203	
		Thallium	0.10	U	ug/L	P417203	
	SM 2340 B-2011	Hardness	35.4		mg/L	P417203	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Johns Lake @ conservation area dock **Collection Date/Time: 07/25/2022 10:40**

Field ID: G1CE0111 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2343733	DEP SOP: NU-094-1	Color (true)	160		PCU	P417181	
	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P417193	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P417634	
		Sulfate	7.4		mg SO4/L	P417639	
	SM 2320 B-2011	Total Alkalinity	45		mg CaCO3/L	P417437	
	SM 2540 C-2011	TDS	143		mg/L	P417660	
	SM 2540 D-2011	TSS	2	I	mg/L	P417663	
	SM 4500-F- C-2011	Fluoride	0.13		mg F/L	P417442	
2343734	EPA 350.1 Rev. 2.0	Ammonia-N	0.090		mg N/L	P417323	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P417241	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.036		mg N/L	P417309	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P417342	
	SM 5310 B-2011	Organic Carbon	17		mg C/L	P417295	
2343740	EPA 200.7 Rev. 4.4	Calcium	17.6		mg/L	P417203	
		Iron	180		ug/L	P417203	
		Magnesium	4.92		mg/L	P417203	
		Potassium	5.3		mg/L	P417203	
		Sodium	19.5		mg/L	P417203	
		Strontium	48.5		ug/L	P417203	
		Tin	3.0	U	ug/L	P417203	
		Titanium	0.77	I	ug/L	P417203	
		Vanadium	2.0	U	ug/L	P417203	
		Zinc	5.0	U	ug/L	P417203	
	EPA 200.8 Rev. 5.4	Aluminum	88		ug/L	P417203	
		Antimony	0.14	I	ug/L	P417203	
		Arsenic	1.28		ug/L	P417203	
		Barium	13.8		ug/L	P417203	
		Beryllium	0.010	U	ug/L	P417203	
		Boron	43.8		ug/L	P417203	
		Cadmium	0.020	U	ug/L	P417203	
		Chromium	0.40	U	ug/L	P417203	
		Cobalt	0.054	I	ug/L	P417203	
		Copper	1.64		ug/L	P417203	
		Lead	0.23	I	ug/L	P417203	
		Manganese	22.0		ug/L	P417203	
		Molybdenum	0.86		ug/L	P417203	
		Nickel	0.50	U	ug/L	P417203	
		Selenium	0.20	U	ug/L	P417203	
		Silver	0.010	U	ug/L	P417203	
		Thallium	0.10	U	ug/L	P417203	
	SM 2340 B-2011	Hardness	64.2		mg/L	P417203	

Ref. Method and Comment:
SM 2540 D-2011: 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: P417181

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P417182

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417193

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417203

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: P417203

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: P417634

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417639

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417315

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417323

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417241

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417309

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417342

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

Reference Method: SM 2320 B-2011
Batch ID: P417437

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

Reference Method: SM 2540 C-2011
Batch ID: P417660

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P417663

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P417295

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: P417181

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P417182

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417193

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417203

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	102		P	85 - 115
Sodium	110		P	85 - 115
Strontium	97.6		P	85 - 115
Tin	97.7		P	85 - 115
Titanium	99.9		P	85 - 115
Vanadium	98.2		P	85 - 115
Zinc	98.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417203

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.9		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	98.9		P	85 - 115
Barium	102		P	85 - 115
Beryllium	88.9		P	85 - 115
Boron	102		P	85 - 115
Cadmium	96.8		P	85 - 115
Chromium	98.1		P	85 - 115
Cobalt	99.1		P	85 - 115
Copper	100		P	85 - 115
Lead	93.8		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	95.7		P	85 - 115
Nickel	99.5		P	85 - 115
Selenium	98.7		P	85 - 115
Silver	97.0		P	85 - 115
Thallium	97.1		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417634

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417315

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417323

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417241

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: P417309

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: P417342

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

Reference Method: SM 2320 B-2011
Batch ID: P417437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.7		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	104		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P417295

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: P417203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343749	Calcium	107		P	80 - 120
2343749	Iron	111		P	80 - 120
2343749	Magnesium	112		P	80 - 120
2343749	Potassium	108		P	80 - 120
2343749	Sodium	100		P	80 - 120
2343749	Strontium	98.2		P	80 - 120
2343749	Tin	102		P	80 - 120
2343749	Titanium	105		P	80 - 120
2343749	Vanadium	104		P	80 - 120
2343749	Zinc	100		P	80 - 120
2343980	Calcium	107	108	P/P	80 - 120
2343980	Iron	110	108	P/P	80 - 120
2343980	Magnesium	111	110	P/P	80 - 120
2343980	Potassium	108	106	P/P	80 - 120
2343980	Sodium	102	102	P/P	80 - 120
2343980	Strontium	100	99.1	P/P	80 - 120
2343980	Tin	99.5	102	P/P	80 - 120
2343980	Titanium	103	104	P/P	80 - 120
2343980	Vanadium	102	103	P/P	80 - 120
2343980	Zinc	100	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343749	Aluminum	100		P	80 - 120
2343749	Antimony	103		P	80 - 120
2343749	Arsenic	103		P	80 - 120
2343749	Barium	105		P	80 - 120
2343749	Beryllium	95.2		P	80 - 120
2343749	Boron	104		P	80 - 120
2343749	Cadmium	99.3		P	80 - 120
2343749	Chromium	102		P	80 - 120
2343749	Cobalt	102		P	80 - 120
2343749	Copper	103		P	80 - 120
2343749	Lead	97.2		P	80 - 120
2343749	Manganese	103		P	80 - 120
2343749	Molybdenum	100		P	80 - 120
2343749	Nickel	102		P	80 - 120
2343749	Selenium	101		P	80 - 120
2343749	Silver	99.2		P	80 - 120
2343749	Thallium	102		P	80 - 120
2343980	Aluminum	102	100	P/P	80 - 120
2343980	Antimony	100	100	P/P	80 - 120
2343980	Arsenic	98.3	98.1	P/P	80 - 120
2343980	Barium	102	102	P/P	80 - 120
2343980	Beryllium	89.3	88.6	P/P	80 - 120
2343980	Boron	104	103	P/P	80 - 120
2343980	Cadmium	98.0	97.3	P/P	80 - 120
2343980	Chromium	98.4	99.3	P/P	80 - 120
2343980	Cobalt	98.3	98.6	P/P	80 - 120
2343980	Copper	102	101	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343980	Lead	94.3	94.4	P/P	80 - 120
2343980	Manganese	100	100	P/P	80 - 120
2343980	Molybdenum	96.1	96.4	P/P	80 - 120
2343980	Nickel	98.7	99.1	P/P	80 - 120
2343980	Selenium	96.7	97.3	P/P	80 - 120
2343980	Silver	97.3	97.1	P/P	80 - 120
2343980	Thallium	98.6	99.9	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343731	Chloride	99.9		P	90 - 110
2343766	Chloride	95.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343731	Sulfate	99.8		P	90 - 110
2343766	Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343732	Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2342760	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343734	Kjeldahl Nitrogen	99.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343690	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343742	Total-P	104	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344107	Fluoride	104	103	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P417295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343697	Organic Carbon	97.8	98.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P417181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343705	Color (true)	1.24	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P417182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343731	Color (true)	1.87	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343729	Turbidity	6.57	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343980	Calcium	0.894	Spike	P	0 - 20
2343980	Iron	1.44	Spike	P	0 - 20
2343980	Magnesium	1.04	Spike	P	0 - 20
2343980	Potassium	1.95	Spike	P	0 - 20
2343980	Sodium	0.323	Spike	P	0 - 20
2343980	Strontium	1.08	Spike	P	0 - 20
2343980	Tin	2.11	Spike	P	0 - 20
2343980	Titanium	0.844	Spike	P	0 - 20
2343980	Vanadium	1.33	Spike	P	0 - 20
2343980	Zinc	1.10	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343980	Aluminum	1.50	Spike	P	0 - 20
2343980	Antimony	0.276	Spike	P	0 - 20
2343980	Arsenic	0.181	Spike	P	0 - 20
2343980	Barium	0.236	Spike	P	0 - 20
2343980	Beryllium	0.753	Spike	P	0 - 20
2343980	Boron	1.45	Spike	P	0 - 20
2343980	Cadmium	0.711	Spike	P	0 - 20
2343980	Chromium	0.858	Spike	P	0 - 20
2343980	Cobalt	0.351	Spike	P	0 - 20
2343980	Copper	0.420	Spike	P	0 - 20
2343980	Lead	0.0509	Spike	P	0 - 20
2343980	Manganese	0.0939	Spike	P	0 - 20
2343980	Molybdenum	0.289	Spike	P	0 - 20
2343980	Nickel	0.399	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343980	Selenium	0.648	Spike	P	0 - 20
2343980	Silver	0.247	Spike	P	0 - 20
2343980	Thallium	1.28	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343731	Chloride	2.06	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343731	Sulfate	0.898	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343732	Ammonia-N	1.57	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2342760	Ammonia-N	0.985	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343734	Kjeldahl Nitrogen	1.08	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343690	NO2NO3-N	0.462	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343742	Total-P	0.379	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P417437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344107	Total Alkalinity	0.908	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P417660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343695	TDS	5.25	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344107	Fluoride	1.01	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P417295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343697	Organic Carbon	0.544	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A113712
Included Lab Sample IDs: 2343729, 2343731, 2343733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 110
Color (true)	101	102	P/P	90 - 110
Color (true)	103	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A113715
Included Lab Sample IDs: 2343729, 2343731, 2343733

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

Reference Method: SM 5310 B-2011
Run ID: A113757
Included Lab Sample IDs: 2343730, 2343732, 2343734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.9	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113761
Included Lab Sample IDs: 2343730, 2343732, 2343734

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113763
Included Lab Sample IDs: 2343730, 2343732

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.1	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113765
Included Lab Sample IDs: 2343734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113782
Included Lab Sample IDs: 2343730, 2343732, 2343734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	101	P/P	90 - 110
Kjeldahl Nitrogen	101	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A113786
Included Lab Sample IDs: 2343739, 2343740

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	102	P/P	90 - 110
Antimony	98.6	98.5	P/P	90 - 110
Arsenic	99.9	99.6	P/P	90 - 110
Barium	99.6	99.6	P/P	90 - 110
Beryllium	94.7	93.0	P/P	90 - 110
Boron	101	105	P/P	90 - 110
Cadmium	99.7	100	P/P	90 - 110
Chromium	100	100	P/P	90 - 110
Cobalt	99.2	99.8	P/P	90 - 110
Copper	101	102	P/P	90 - 110
Lead	94.0	93.9	P/P	90 - 110
Manganese	100	102	P/P	90 - 110
Molybdenum	97.5	97.1	P/P	90 - 110
Nickel	100	100	P/P	90 - 110
Selenium	99.8	98.2	P/P	90 - 110
Silver	98.6	99.1	P/P	90 - 110
Thallium	98.3	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113794
Included Lab Sample IDs: 2343730, 2343734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113800
Included Lab Sample IDs: 2343732

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

Reference Method: SM 2320 B-2011
Run ID: A113811
Included Lab Sample IDs: 2343729, 2343731, 2343733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	97.6	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A113811
Included Lab Sample IDs: 2343729, 2343731, 2343733

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A113865
Included Lab Sample IDs: 2343739, 2343740

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A113865
Included Lab Sample IDs: 2343739, 2343740

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	103	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	98.4	102	P/P	90 - 110
Sodium	97.8	100	P/P	90 - 110
Strontium	96.1	97.8	P/P	90 - 110
Tin	99.5	97.1	P/P	90 - 110
Titanium	100	97.9	P/P	90 - 110
Vanadium	99.2	97.1	P/P	90 - 110
Zinc	96.8	94.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A113902
Included Lab Sample IDs: 2343729, 2343731, 2343733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.4	96.9	P/P	90 - 110
Chloride	96.9	94.7	P/P	90 - 110
Sulfate	95.9	96.1	P/P	90 - 110
Sulfate	96.1	93.6	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		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	102					1.24	
	Color (true)	102					1.87	
EPA 180.1 Rev. 2.0	Turbidity	97.3					6.57	
EPA 200.7 Rev. 4.4	Calcium	107	107	108	107			0.894
	Iron	106	110	108	111			1.44
	Magnesium	108	111	110	112			1.04
	Potassium	102	108	106	108			1.95
	Sodium	110	102	102	100			0.323
	Strontium	97.6	100	99.1	98.2			1.08
	Tin	97.7	99.5	102	102			2.11
	Titanium	99.9	103	104	105			0.844
	Vanadium	98.2	102	103	104			1.33
	Zinc	98.0	100	101	100			1.10
EPA 200.8 Rev. 5.4	Aluminum	99.9	100	102	100			1.50
	Antimony	100	103	100	100			0.276
	Arsenic	98.9	103	98.3	98.1			0.181
	Barium	102	105	102	102			0.236
	Beryllium	88.9	95.2	89.3	88.6			0.753
	Boron	102	104	104	103			1.45
	Cadmium	96.8	99.3	98.0	97.3			0.711
	Chromium	98.1	102	98.4	99.3			0.858
	Cobalt	99.1	102	98.3	98.6			0.351
	Copper	100	103	102	101			0.420
	Lead	93.8	97.2	94.3	94.4			0.0509
	Manganese	100	103	100	100			0.0939
	Molybdenum	95.7	100	96.1	96.4			0.289
	Nickel	99.5	102	98.7	99.1			0.399
	Selenium	98.7	101	96.7	97.3			0.648
	Silver	97.0	99.2	97.3	97.1			0.247
	Thallium	97.1	102	98.6	99.9			1.28
EPA 300.0 Rev. 2.1	Chloride	94.8	99.9	95.5			2.06	
	Sulfate	95.0	99.8	95.7			0.898	
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	103	101				1.57
	Ammonia-N	98.8	101	102				0.985
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	99.4	101				1.08
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101				0.462
EPA 365.1 Rev. 2.0	Total-P	100	104	104				0.379
SM 2320 B-2011	Total Alkalinity	99.7					0.908	
SM 2540 C-2011	TDS						5.25	
SM 4500-F- C-2011	Fluoride	104	104	103				1.01
SM 5310 B-2011	Organic Carbon	95.8	97.8	98.5				0.544

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2343729, 2343731, 2343733
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2343729, 2343731, 2343733
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2343739, 2343740
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2343739, 2343740
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2343729, 2343731, 2343733
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2343729, 2343731, 2343733

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2343730, 2343732, 2343734
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2343730, 2343732, 2343734
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2343730, 2343732, 2343734
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2343730, 2343732, 2343734
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2343729, 2343731, 2343733
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2343739, 2343740
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2343729, 2343731, 2343733
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2343729, 2343731, 2343733
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2343729, 2343731, 2343733
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2343730, 2343732, 2343734

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	07/26/2022			07/26/2022 15:05	Anna M. Plaviak	2343729
	07/26/2022			07/26/2022 15:12	Anna M. Plaviak	2343731
	07/26/2022			07/26/2022 15:41	Anna M. Plaviak	2343733
EPA 180.1 Rev. 2.0	07/26/2022			07/26/2022 14:04	Khloe J Berg	2343729
	07/26/2022			07/26/2022 14:09	Khloe J Berg	2343731
	07/26/2022			07/26/2022 14:10	Khloe J Berg	2343733
EPA 200.7 Rev. 4.4	07/26/2022	07/27/2022 09:35	Mackenzie Hunt	08/02/2022 17:16	Alexander Thompson	2343739
	07/26/2022	07/27/2022 09:35	Mackenzie Hunt	08/02/2022 17:24	Alexander Thompson	2343740
EPA 200.8 Rev. 5.4	07/26/2022	07/27/2022 09:35	Mackenzie Hunt	07/28/2022 21:31	Emily M Philpot	2343739
	07/26/2022	07/27/2022 09:35	Mackenzie Hunt	07/28/2022 21:40	Emily M Philpot	2343740
EPA 300.0 Rev. 2.1	07/26/2022			08/03/2022 14:05	Anna M. Plaviak	2343731
	07/26/2022			08/03/2022 16:18	Anna M. Plaviak	2343729
	07/26/2022			08/03/2022 16:54	Anna M. Plaviak	2343733
EPA 350.1 Rev. 2.0	07/26/2022			07/28/2022 11:52	Ping Hua	2343732
	07/26/2022			07/28/2022 12:05	Ping Hua	2343730
	07/26/2022			07/28/2022 12:41	Judith K. Clark	2343734
EPA 351.2 Rev. 2.0	07/26/2022	07/28/2022 11:30	Simonne.V. Calhoun	07/28/2022 17:33	Samantha L Bates	2343730
	07/26/2022	07/28/2022 11:30	Simonne.V. Calhoun	07/28/2022 17:38	Samantha L Bates	2343732
	07/26/2022	07/28/2022 11:30	Simonne.V. Calhoun	07/28/2022 17:40	Samantha L Bates	2343734
EPA 353.2 Rev. 2.0	07/26/2022			07/28/2022 11:16	Beverly Y. Sanders	2343730
	07/26/2022			07/28/2022 11:17	Beverly Y. Sanders	2343732
	07/26/2022			07/28/2022 11:18	Beverly Y. Sanders	2343734
EPA 365.1 Rev. 2.0	07/26/2022	07/28/2022 17:50	Adam P Silver	07/29/2022 10:18	James L Waggerby	2343730
	07/26/2022	07/28/2022 17:50	Adam P Silver	07/29/2022 10:20	James L Waggerby	2343734
	07/26/2022	07/28/2022 17:50	Adam P Silver	07/29/2022 13:44	James L Waggerby	2343732
SM 2320 B-2011	07/26/2022			07/30/2022 11:16	Adam P Silver	2343729
	07/26/2022			07/30/2022 11:28	Adam P Silver	2343731
	07/26/2022			07/30/2022 11:42	Adam P Silver	2343733
SM 2340 B-2011	07/26/2022			08/02/2022 17:16	Alexander Thompson	2343739
	07/26/2022			08/02/2022 17:24	Alexander Thompson	2343740
SM 2540 C-2011	07/26/2022			07/29/2022 15:04	Yijie Li	2343729, 2343731, 2343733
SM 2540 D-2011	07/26/2022			07/29/2022 15:04	Yijie Li	2343729, 2343731, 2343733
SM 4500-F- C-2011	07/26/2022			07/30/2022 11:16	Adam P Silver	2343729
	07/26/2022			07/30/2022 11:28	Adam P Silver	2343731
	07/26/2022			07/30/2022 11:42	Adam P Silver	2343733
SM 5310 B-2011	07/26/2022			07/28/2022 03:11	Khloe J Berg	2343730
	07/26/2022			07/28/2022 03:25	Khloe J Berg	2343732
	07/26/2022			07/28/2022 03:39	Khloe J Berg	2343734