Chemical Analysis Report

NE-DIST-2023-02-16-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Thomas Creek Deploy**
Request ID: **RQ-2023-02-06-48**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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Certified by: Colin Wright, Program Administrator

Date Certified: 10-MAR-2023 12:36

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: Thomas CR 6.0mi Below City Prison **Collection Date/Time: 02/15/2023 10:50**

Field ID: G4NE0008 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2388168	EPA 200.7 Rev. 4.4	Calcium	38.3		mg/L	P426158	
		Iron	600		ug/L	P426158	
		Magnesium	85.3		mg/L	P426158	
		Strontium	511		ug/L	P426158	
		Tin	3.0	U	ug/L	P426158	
		Titanium	13.6		ug/L	P426158	
		Vanadium	2.4	I	ug/L	P426158	
		Zinc	5.0	U	ug/L	P426158	
	EPA 200.8 Rev. 5.4	Aluminum	426		ug/L	P426158	
		Antimony	0.061	I	ug/L	P426158	
		Arsenic	0.67		ug/L	P426158	
		Beryllium	0.041		ug/L	P426158	
		Cadmium	0.020	U	ug/L	P426158	
		Chromium	0.85	I	ug/L	P426158	
		Cobalt	0.223		ug/L	P426158	
		Copper	0.40	U	ug/L	P426158	
		Lead	0.38	I	ug/L	P426158	
		Manganese	48.3		ug/L	P426158	
		Molybdenum	0.41	I	ug/L	P426158	
		Nickel	0.60	I	ug/L	P426158	
		Selenium	0.20	U	ug/L	P426158	
		Silver	0.010	U	ug/L	P426328	
		Thallium	0.10	U	ug/L	P426158	

Sample Location: Thomas Creek 5 Miles Down from Ethel **Collection Date/Time: 02/15/2023 11:15**

Field ID: G4NE0298 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2388161	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P425972	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P426394	
	SM 2540 D-2015	TSS	4	I	mg/L	P426378	RPD
	SM 4500-F- C-2011	Fluoride	0.077	I	mg F/L	P426397	
2388162	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P426417	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P426330	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.034		mg N/L	P426137	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P426349	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P426274	

Sample Location: FB_02152023 **Collection Date/Time: 02/15/2023 11:20**

Field ID: FB_02152023 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2388163	DEP SOP: NU-094-1	Color (true)	2.5	U	PCU	P425969	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P425972	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P426519	
		Sulfate	0.20	U	mg SO4/L	P426521	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P426394	
	SM 2540 C-2015	TDS	15	U	mg/L	P426485	
	SM 2540 D-2015	TSS	2	U	mg/L	P426376	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P426397	
2388164	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P426252	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P426330	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P426137	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P426349	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P426274	

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: P425969

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P425972

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426158

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	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: P426158

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426328

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426519

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426521

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426252

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426330

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426137

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426349

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

Reference Method: SM 2320 B-2011
Batch ID: P426394

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

Reference Method: SM 2540 C-2015
Batch ID: P426485

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P426376

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P426378

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P426397

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P426274

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: P425969

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: P425972

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426158

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	101		P	85 - 115
Magnesium	105		P	85 - 115
Strontium	98.7		P	85 - 115
Tin	102		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	98.6		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426158

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.7		P	85 - 115
Antimony	99.6		P	85 - 115
Arsenic	96.7		P	85 - 115
Beryllium	93.0		P	85 - 115
Cadmium	98.0		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	98.7		P	85 - 115
Copper	97.6		P	85 - 115
Lead	95.5		P	85 - 115
Manganese	99.3		P	85 - 115
Molybdenum	95.6		P	85 - 115
Nickel	99.9		P	85 - 115
Selenium	98.1		P	85 - 115
Thallium	97.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426328

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426519

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	106		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426252

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426330

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426349

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

Reference Method: SM 2320 B-2011
Batch ID: P426394

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.1		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P426485

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

Reference Method: SM 2540 D-2015
Batch ID: P426376

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	95.3		P	85 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P426378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	95.3		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P426397

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426274

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: P426158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388015	Calcium	98.1		P	80 - 120
2388015	Iron	99.9	102	P/P	80 - 120
2388015	Magnesium	103	105	P/P	80 - 120
2388015	Strontium	97.4	98.8	P/P	80 - 120
2388015	Tin	102	102	P/P	80 - 120
2388015	Titanium	103	104	P/P	80 - 120
2388015	Vanadium	100	101	P/P	80 - 120
2388015	Zinc	104	105	P/P	80 - 120
2388431	Calcium	97.2		P	80 - 120
2388431	Iron	100		P	80 - 120
2388431	Magnesium	101		P	80 - 120
2388431	Strontium	96.4		P	80 - 120
2388431	Tin	99.4		P	80 - 120
2388431	Titanium	103		P	80 - 120
2388431	Vanadium	101		P	80 - 120
2388431	Zinc	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388015	Aluminum	112	95.6	P/P	80 - 120
2388015	Antimony	99.9	99.6	P/P	80 - 120
2388015	Arsenic	96.7	96.1	P/P	80 - 120
2388015	Beryllium	94.6	94.7	P/P	80 - 120
2388015	Cadmium	99.8	96.9	P/P	80 - 120
2388015	Chromium	99.4	99.1	P/P	80 - 120
2388015	Cobalt	97.3	96.5	P/P	80 - 120
2388015	Copper	97.1	95.8	P/P	80 - 120
2388015	Lead	96.7	95.0	P/P	80 - 120
2388015	Manganese	101	98.2	P/P	80 - 120
2388015	Molybdenum	97.1	97.0	P/P	80 - 120
2388015	Nickel	99.2	98.2	P/P	80 - 120
2388015	Selenium	96.7	95.7	P/P	80 - 120
2388015	Thallium	98.7	98.8	P/P	80 - 120
2388431	Aluminum	95.8		P	80 - 120
2388431	Antimony	99.4		P	80 - 120
2388431	Arsenic	94.4		P	80 - 120
2388431	Beryllium	91.0		P	80 - 120
2388431	Cadmium	97.2		P	80 - 120
2388431	Chromium	97.4		P	80 - 120
2388431	Cobalt	94.8		P	80 - 120
2388431	Copper	92.6		P	80 - 120
2388431	Lead	96.0		P	80 - 120
2388431	Manganese	97.1		P	80 - 120
2388431	Molybdenum	94.9		P	80 - 120
2388431	Nickel	97.8		P	80 - 120
2388431	Selenium	95.2		P	80 - 120
2388431	Thallium	97.7		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426328

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388014	Silver	101	102	P/P	80 - 120
2388432	Silver	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426519

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387929	Chloride	96.8		P	90 - 110
2387931	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387929	Sulfate	101		P	90 - 110
2387931	Sulfate	106		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387990	Ammonia-N	98.4	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387936	Ammonia-N	97.8	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388308	Kjeldahl Nitrogen	94.2	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388148	NO2NO3-N	96.0	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426349

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388064	Total-P	103	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P426397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2388643	Fluoride	102	99.7	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P426274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2387936	Organic Carbon	94.6	96.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P425969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388147	Color (true)	2.32	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P425972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387918	Turbidity	4.23	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388015	Calcium	0.501	Spike	P	0 - 20
2388015	Iron	1.72	Spike	P	0 - 20
2388015	Magnesium	1.20	Spike	P	0 - 20
2388015	Strontium	1.36	Spike	P	0 - 20
2388015	Tin	0.475	Spike	P	0 - 20
2388015	Titanium	0.653	Spike	P	0 - 20
2388015	Vanadium	0.561	Spike	P	0 - 20
2388015	Zinc	0.557	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388015	Aluminum	15.6	Spike	P	0 - 20
2388015	Antimony	0.378	Spike	P	0 - 20
2388015	Arsenic	0.653	Spike	P	0 - 20
2388015	Beryllium	0.118	Spike	P	0 - 20
2388015	Cadmium	3.01	Spike	P	0 - 20
2388015	Chromium	0.334	Spike	P	0 - 20
2388015	Cobalt	0.811	Spike	P	0 - 20
2388015	Copper	1.30	Spike	P	0 - 20
2388015	Lead	1.82	Spike	P	0 - 20
2388015	Manganese	1.44	Spike	P	0 - 20
2388015	Molybdenum	0.127	Spike	P	0 - 20
2388015	Nickel	1.06	Spike	P	0 - 20
2388015	Selenium	0.982	Spike	P	0 - 20
2388015	Thallium	0.113	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388014	Silver	0.206	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387929	Chloride	1.21	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387929	Sulfate	1.32	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387990	Ammonia-N	0.130	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387936	Ammonia-N	0.935	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388308	Kjeldahl Nitrogen	7.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388148	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388064	Total-P	0.253	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P426394

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388643	Total Alkalinity	1.19	Sample	P	0 - 3.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2015
Batch ID: P426485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387726	TDS	4.89	Sample	P	0 - 10

Reference Method: SM 2540 D-2015
Batch ID: P426378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387932	TSS	10.2	Sample	F	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P426397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2388643	Fluoride	1.49	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P426274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2387936	Organic Carbon	2.10	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: A117491
Included Lab Sample IDs: 2388163

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A117492
Included Lab Sample IDs: 2388161, 2388163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117560
Included Lab Sample IDs: 2388162, 2388164

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117602
Included Lab Sample IDs: 2388164

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	99.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A117613
Included Lab Sample IDs: 2388168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.6	P/P	90 - 110
Iron	100	98.5	P/P	90 - 110
Magnesium	100	98.7	P/P	90 - 110
Strontium	101	101	P/P	90 - 110
Tin	102	101	P/P	90 - 110
Titanium	102	101	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117614
Included Lab Sample IDs: 2388168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.0	95.3	P/P	90 - 110
Antimony	98.3	97.9	P/P	90 - 110
Arsenic	96.3	93.8	P/P	90 - 110
Beryllium	96.2	93.0	P/P	90 - 110
Cadmium	95.8	95.8	P/P	90 - 110
Chromium	97.3	95.1	P/P	90 - 110
Cobalt	95.3	93.1	P/P	90 - 110
Copper	92.9	92.0	P/P	90 - 110
Lead	93.4	93.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117614
Included Lab Sample IDs: 2388168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	98.0	97.1	P/P	90 - 110
Molybdenum	94.5	93.9	P/P	90 - 110
Nickel	94.8	93.2	P/P	90 - 110
Selenium	96.9	96.4	P/P	90 - 110
Thallium	96.8	97.1	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A117617
Included Lab Sample IDs: 2388162, 2388164

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	96.6	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A117667
Included Lab Sample IDs: 2388161, 2388163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.0	99.1	P/P	90 - 110
Total Alkalinity	99.1	96.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117667
Included Lab Sample IDs: 2388161, 2388163

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117676
Included Lab Sample IDs: 2388162

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117682
Included Lab Sample IDs: 2388164

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117685
Included Lab Sample IDs: 2388162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A117687
Included Lab Sample IDs: 2388163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.3	95.9	P/P	90 - 110
Sulfate	101	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117720
Included Lab Sample IDs: 2388168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	101	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117796
Included Lab Sample IDs: 2388162, 2388164

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.7	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	102					2.32	
EPA 180.1 Rev. 2.0	Turbidity	101					4.23	
EPA 200.7 Rev. 4.4	Calcium	101	98.1	97.2				0.501
	Iron	101	99.9	102	100			1.72
	Magnesium	105	103	105	101			1.20
	Strontium	98.7	97.4	98.8	96.4			1.36
	Tin	102	102	102	99.4			0.475
	Titanium	101	103	104	103			0.653
	Vanadium	98.6	100	101	101			0.561
	Zinc	106	104	105	105			0.557
EPA 200.8 Rev. 5.4	Aluminum	96.7	112	95.6	95.8			15.6
	Antimony	99.6	99.9	99.6	99.4			0.378
	Arsenic	96.7	96.7	96.1	94.4			0.653
	Beryllium	93.0	94.6	94.7	91.0			0.118
	Cadmium	98.0	99.8	96.9	97.2			3.01
	Chromium	100	99.4	99.1	97.4			0.334
	Cobalt	98.7	97.3	96.5	94.8			0.811
	Copper	97.6	97.1	95.8	92.6			1.30
	Lead	95.5	96.7	95.0	96.0			1.82
	Manganese	99.3	101	98.2	97.1			1.44
	Molybdenum	95.6	97.1	97.0	94.9			0.127
	Nickel	99.9	99.2	98.2	97.8			1.06
	Selenium	98.1	96.7	95.7	95.2			0.982
	Silver	103	102	101	102			0.206
	Thallium	97.9	98.7	98.8	97.7			0.113
EPA 300.0 Rev. 2.1	Chloride	103	96.8	102			1.21	
	Sulfate	106	101	106			1.32	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	98.4	98.2				0.130
	Ammonia-N	98.0	97.8	98.8				0.935
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	94.2	104				7.50
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	96.0	96.0				0.0
EPA 365.1 Rev. 2.0	Total-P	100	103	103				0.253
SM 2320 B-2011	Total Alkalinity	98.1					1.19	
SM 2540 C-2015	TDS	104					4.89	
SM 2540 D-2015	TSS	95.3						
	TSS	95.3					10.2	
SM 4500-F- C-2011	Fluoride	101	102	99.7				1.49
SM 5310 B-2011	Organic Carbon	95.8	94.6	96.8				2.10

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2388163
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2388161, 2388163
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2388168
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2388168
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2388163
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2388163
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2388162, 2388164
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2388162, 2388164
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2388162, 2388164

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2388162, 2388164
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2388161, 2388163
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2388163
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2388161, 2388163
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2388161, 2388163
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2388162, 2388164

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	02/16/2023			02/16/2023 15:12	Alexis Price	2388163
EPA 180.1 Rev. 2.0	02/16/2023			02/16/2023 15:15	Khloe J Berg	2388161
	02/16/2023			02/16/2023 15:16	Khloe J Berg	2388163
EPA 200.7 Rev. 4.4	02/16/2023	02/21/2023 12:40	George D Taylor	02/22/2023 19:15	McKinley C Carter	2388168
EPA 200.8 Rev. 5.4	02/16/2023	02/21/2023 12:40	George D Taylor	02/22/2023 15:59	Conrad Hartmann	2388168
	02/16/2023	02/24/2023 10:50	George D Taylor	02/28/2023 12:51	Conrad Hartmann	2388168
EPA 300.0 Rev. 2.1	02/16/2023			03/01/2023 07:22	Judith K. Clark	2388163
EPA 350.1 Rev. 2.0	02/16/2023			02/22/2023 13:45	Ping Hua	2388164
	02/16/2023			02/27/2023 11:35	Ping Hua	2388162
EPA 351.2 Rev. 2.0	02/16/2023	02/24/2023 12:50	Simonne.V. Calhoun	03/03/2023 14:33	Judith K. Clark	2388162
	02/16/2023	02/24/2023 12:50	Simonne.V. Calhoun	03/03/2023 14:34	Judith K. Clark	2388164
EPA 353.2 Rev. 2.0	02/16/2023			02/20/2023 12:22	Beverly Y. Sanders	2388162
	02/16/2023			02/20/2023 12:23	Beverly Y. Sanders	2388164
EPA 365.1 Rev. 2.0	02/16/2023	02/24/2023 12:02	Adam P Silver	02/27/2023 10:21	James L Waggerby	2388162
	02/16/2023	02/24/2023 12:02	Adam P Silver	02/27/2023 12:12	James L Waggerby	2388164
SM 2320 B-2011	02/16/2023			02/25/2023 06:54	Dale L. Simmons	2388163
	02/16/2023			02/25/2023 10:50	Dale L. Simmons	2388161
SM 2540 C-2015	02/16/2023			02/20/2023 15:46	Yijie Li	2388163
SM 2540 D-2015	02/16/2023			02/20/2023 15:46	Yijie Li	2388161, 2388163
SM 4500-F- C-2011	02/16/2023			02/25/2023 06:54	Dale L. Simmons	2388163
	02/16/2023			02/25/2023 10:50	Dale L. Simmons	2388161
SM 5310 B-2011	02/16/2023			02/22/2023 17:34	Elise M. Gillis	2388162
	02/16/2023			02/22/2023 17:48	Elise M. Gillis	2388164