

Chemical Analysis Report

CEN-DIST-2023-11-30-05

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

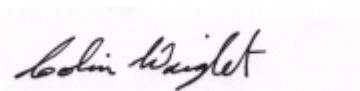
Event Description: **Shady Brook Bio**
Request ID: **RQ-2023-03-06-25**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 15-DEC-2023 12:39

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

Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: SHADY BROOK AT 2400M US OF US 31

Collection Date/Time: 11/29/2023 11:58

Field ID: G1CE0021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2453853	DEP SOP: NU-094-1	Color (true)	91		PCU	P438368	
	EPA 180.1 Rev. 2.0	Turbidity	0.35	I	NTU	P438376	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P438738	
		Sulfate	4.6		mg SO4/L	P438741	
	SM 2320 B-2011	Total Alkalinity	126		mg CaCO3/L	P438460	
	SM 2540 C-2015	TDS	189		mg/L	P438847	
	SM 2540 D-2015	TSS	2	U	mg/L	P438774	
	SM 4500-F- C-2011	Fluoride	0.10		mg F/L	P438463	
2453854	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P438569	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P438467	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P438475	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P438576	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P438532	
2453855	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P438370	
2453868	EPA 200.7 Rev. 4.4	Calcium	57.6		mg/L	P438401	
		Iron	240		ug/L	P438401	
		Magnesium	3.53		mg/L	P438401	
		Potassium	1.7		mg/L	P438401	
		Sodium	9.7		mg/L	P438401	
		Strontium	95.1		ug/L	P438401	
		Tin	3.0	U	ug/L	P438401	
		Titanium	0.75	U	ug/L	P438401	
		Vanadium	10.3		ug/L	P438401	
		Zinc	5.0	U	ug/L	P438401	
	EPA 200.8 Rev. 5.4	Aluminum	7.5	I	ug/L	P438401	
		Antimony	0.10	I	ug/L	P438401	
		Arsenic	0.45		ug/L	P438401	
		Barium	7.73		ug/L	P438401	
		Beryllium	0.010	U	ug/L	P438401	
		Boron	18.4		ug/L	P438401	
		Cadmium	0.020	U	ug/L	P438401	
		Chromium	0.40	U	ug/L	P438401	
		Cobalt	0.071	I	ug/L	P438401	
		Copper	0.40	U	ug/L	P438401	
		Lead	0.20	U	ug/L	P438401	
		Manganese	3.61		ug/L	P438401	
		Molybdenum	0.86		ug/L	P438401	
		Nickel	0.50	U	ug/L	P438401	
		Selenium	0.37	I	ug/L	P438401	
		Silver	0.010	U	ug/L	P438401	
		Thallium	0.10	U	ug/L	P438401	
	SM 2340 B-2011	Hardness	158		mg/L	P438401	

Field ID: G1CE0021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
-----------	-------------	-----------	--------	------	-------	----------	----------

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P438368

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438376

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438401

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: P438401

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438738

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: P438741

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438569

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438467

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438475

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438576

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438370

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

Reference Method: SM 2320 B-2011
Batch ID: P438460

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

Reference Method: SM 2540 C-2015
Batch ID: P438847

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P438774

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P438463

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P438532

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: P438368

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: P438376

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	109		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	101		P	85 - 115
Sodium	106		P	85 - 115
Strontium	100		P	85 - 115
Tin	99.9		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.2		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	98.9		P	85 - 115
Barium	101		P	85 - 115
Beryllium	95.8		P	85 - 115
Boron	99.2		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	98.6		P	85 - 115
Cobalt	96.2		P	85 - 115
Copper	96.4		P	85 - 115
Lead	95.5		P	85 - 115
Manganese	96.7		P	85 - 115
Molybdenum	97.1		P	85 - 115
Nickel	96.2		P	85 - 115
Selenium	97.2		P	85 - 115
Silver	101		P	85 - 115
Thallium	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438738

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438741

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438569

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438467

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438475

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438576

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.1		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P438460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.1		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P438847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	93.6		P	85 - 115

Reference Method: SM 2540 D-2015
Batch ID: P438774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	97.6		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P438463

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P438532

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P438401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453640	Calcium	95.6		P	80 - 120
2453640	Iron	109		P	80 - 120
2453640	Magnesium	102		P	80 - 120
2453640	Potassium	101		P	80 - 120
2453640	Sodium	100		P	80 - 120
2453640	Strontium	98.1		P	80 - 120
2453640	Tin	96.8		P	80 - 120
2453640	Titanium	101		P	80 - 120
2453640	Vanadium	100		P	80 - 120
2453640	Zinc	94.0		P	80 - 120
2453773	Calcium	100		P	80 - 120
2453773	Iron	108	108	P/P	80 - 120
2453773	Magnesium	102		P	80 - 120
2453773	Potassium	105	105	P/P	80 - 120
2453773	Sodium	102	103	P/P	80 - 120
2453773	Strontium	99.9	99.9	P/P	80 - 120
2453773	Tin	98.4	98.2	P/P	80 - 120
2453773	Titanium	103	103	P/P	80 - 120
2453773	Vanadium	102	102	P/P	80 - 120
2453773	Zinc	96.9	97.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P438401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453640	Aluminum	94.5		P	80 - 120
2453640	Antimony	101		P	80 - 120
2453640	Arsenic	96.5		P	80 - 120
2453640	Barium	97.7		P	80 - 120
2453640	Beryllium	88.9		P	80 - 120
2453640	Boron	101		P	80 - 120
2453640	Cadmium	99.6		P	80 - 120
2453640	Chromium	95.0		P	80 - 120
2453640	Cobalt	90.7		P	80 - 120
2453640	Copper	90.1		P	80 - 120
2453640	Lead	93.5		P	80 - 120
2453640	Manganese	94.7		P	80 - 120
2453640	Molybdenum	98.5		P	80 - 120
2453640	Nickel	88.8		P	80 - 120
2453640	Selenium	96.5		P	80 - 120
2453640	Silver	98.0		P	80 - 120
2453640	Thallium	96.7		P	80 - 120
2453773	Aluminum	96.5	96.6	P/P	80 - 120
2453773	Antimony	100	101	P/P	80 - 120
2453773	Arsenic	96.0	95.8	P/P	80 - 120
2453773	Barium	99.4	98.8	P/P	80 - 120
2453773	Beryllium	92.4	94.5	P/P	80 - 120
2453773	Boron	101	98.2	P/P	80 - 120
2453773	Cadmium	101	99.5	P/P	80 - 120
2453773	Chromium	88.9	88.3	P/P	80 - 120
2453773	Cobalt	92.2	91.3	P/P	80 - 120
2453773	Copper	92.1	91.6	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P438401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453773	Lead	95.1	94.4	P/P	80 - 120
2453773	Manganese	96.3	95.0	P/P	80 - 120
2453773	Molybdenum	98.0	97.8	P/P	80 - 120
2453773	Nickel	91.8	90.6	P/P	80 - 120
2453773	Selenium	97.5	95.3	P/P	80 - 120
2453773	Silver	101	98.4	P/P	80 - 120
2453773	Thallium	97.6	97.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P438738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453793	Chloride	102		P	90 - 110
2453940	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P438741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453793	Sulfate	99.8		P	90 - 110
2453940	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P438569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453797	Ammonia-N	95.6	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P438467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453854	Kjeldahl Nitrogen	105	90.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P438475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453798	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P438370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453681	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Batch ID: P438463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453794	Fluoride	102	101	P/P	94 - 106

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P438532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453721	Organic Carbon	96.6	95.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P438368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453791	Color (true)	0.381	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438376

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453795	Turbidity	0.148	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453773	Calcium	1.32	Spike	P	0 - 20
2453773	Iron	0.00336	Spike	P	0 - 20
2453773	Magnesium	1.53	Spike	P	0 - 20
2453773	Potassium	0.609	Spike	P	0 - 20
2453773	Sodium	0.481	Spike	P	0 - 20
2453773	Strontium	0.0449	Spike	P	0 - 20
2453773	Tin	0.279	Spike	P	0 - 20
2453773	Titanium	0.102	Spike	P	0 - 20
2453773	Vanadium	0.301	Spike	P	0 - 20
2453773	Zinc	0.268	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453773	Aluminum	0.198	Spike	P	0 - 20
2453773	Antimony	0.685	Spike	P	0 - 20
2453773	Arsenic	0.236	Spike	P	0 - 20
2453773	Barium	0.636	Spike	P	0 - 20
2453773	Beryllium	2.20	Spike	P	0 - 20
2453773	Boron	2.61	Spike	P	0 - 20
2453773	Cadmium	1.50	Spike	P	0 - 20
2453773	Chromium	0.576	Spike	P	0 - 20
2453773	Cobalt	1.00	Spike	P	0 - 20
2453773	Copper	0.545	Spike	P	0 - 20
2453773	Lead	0.744	Spike	P	0 - 20
2453773	Manganese	1.32	Spike	P	0 - 20
2453773	Molybdenum	0.243	Spike	P	0 - 20
2453773	Nickel	1.31	Spike	P	0 - 20
2453773	Selenium	2.32	Spike	P	0 - 20
2453773	Silver	2.17	Spike	P	0 - 20
2453773	Thallium	0.241	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453793	Chloride	0.661	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453793	Sulfate	0.756	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453797	Ammonia-N	1.39	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453854	Kjeldahl Nitrogen	10.9	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453798	NO2NO3-N	0.368	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453792	Total-P	1.86	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453681	O-Phosphate-P	0.698	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P438460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453794	Total Alkalinity	0.161	Sample	P	0 - 3.9

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P438847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453694	TDS	4.48	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P438463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453794	Fluoride	0.476	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P438532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453721	Organic Carbon	0.817	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: A122963

Included Lab Sample IDs: 2453853

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A122964

Included Lab Sample IDs: 2453855

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A122967

Included Lab Sample IDs: 2453853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A123013

Included Lab Sample IDs: 2453853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.3	96.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A123013

Included Lab Sample IDs: 2453853

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A123014

Included Lab Sample IDs: 2453854

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123018

Included Lab Sample IDs: 2453868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.7	98.7	P/P	90 - 110
Antimony	99.3	99.6	P/P	90 - 110
Arsenic	95.4	95.3	P/P	90 - 110
Barium	98.5	97.1	P/P	90 - 110
Beryllium	95.5	94.4	P/P	90 - 110
Boron	98.1	99.3	P/P	90 - 110
Cadmium	99.3	99.7	P/P	90 - 110
Chromium	99.6	101	P/P	90 - 110
Cobalt	94.4	94.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123018

Included Lab Sample IDs: 2453868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	93.3	91.9	P/P	90 - 110
Lead	95.2	95.1	P/P	90 - 110
Manganese	99.1	100	P/P	90 - 110
Molybdenum	97.5	97.2	P/P	90 - 110
Nickel	94.4	94.6	P/P	90 - 110
Selenium	97.3	96.2	P/P	90 - 110
Silver	96.8	96.8	P/P	90 - 110
Thallium	96.1	95.7	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A123034

Included Lab Sample IDs: 2453854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.5	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A123049

Included Lab Sample IDs: 2453854

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123057

Included Lab Sample IDs: 2453854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123085

Included Lab Sample IDs: 2453854

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A123118

Included Lab Sample IDs: 2453853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123175

Included Lab Sample IDs: 2453868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123175

Included Lab Sample IDs: 2453868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	102	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Strontium	103	104	P/P	90 - 110
Tin	105	105	P/P	90 - 110
Titanium	106	106	P/P	90 - 110
Vanadium	104	104	P/P	90 - 110
Zinc	105	105	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)	102				0.381	
EPA 180.1 Rev. 2.0	Turbidity	104				0.148	
EPA 200.7 Rev. 4.4	Calcium	107	95.6	100			1.32
	Iron	109	109	108	108		0.0033
	Magnesium	106	102	102			1.53
	Potassium	101	101	105	105		0.609
	Sodium	106	100	102	103		0.481
	Strontium	100	98.1	99.9	99.9		0.0449
	Tin	99.9	96.8	98.4	98.2		0.279
	Titanium	103	101	103	103		0.102
	Vanadium	102	100	102	102		0.301
	Zinc	100	94.0	96.9	97.1		0.268
EPA 200.8 Rev. 5.4	Aluminum	98.2	96.5	96.6	94.5		0.198
	Antimony	101	100	101	101		0.685
	Arsenic	98.9	96.0	95.8	96.5		0.236
	Barium	101	99.4	98.8	97.7		0.636
	Beryllium	95.8	92.4	94.5	88.9		2.20
	Boron	99.2	101	98.2	101		2.61
	Cadmium	99.2	101	99.5	99.6		1.50
	Chromium	98.6	88.9	88.3	95.0		0.576
	Cobalt	96.2	92.2	91.3	90.7		1.00
	Copper	96.4	92.1	91.6	90.1		0.545
	Lead	95.5	95.1	94.4	93.5		0.744
	Manganese	96.7	96.3	95.0	94.7		1.32
	Molybdenum	97.1	98.0	97.8	98.5		0.243
	Nickel	96.2	91.8	90.6	88.8		1.31
	Selenium	97.2	97.5	95.3	96.5		2.32
	Silver	101	101	98.4	98.0		2.17
	Thallium	97.8	97.6	97.8	96.7		0.241
EPA 300.0 Rev. 2.1	Chloride	101	102	105		0.661	
	Sulfate	101	99.8	104		0.756	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	95.6	97.0			1.39
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	105	90.5			10.9
EPA 353.2 Rev. 2.0	NO2NO3-N	101	101	100			0.368
EPA 365.1 Rev. 2.0	Total-P	104					1.86
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	101	100			0.698
SM 2320 B-2011	Total Alkalinity	97.1				0.161	
SM 2540 C-2015	TDS	93.6				4.48	
SM 2540 D-2015	TSS	97.6					
SM 4500-F- C-2011	Fluoride	102	102	101			0.476
SM 5310 B-2011	Organic Carbon	95.6	96.6	95.6			0.817

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2453853
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2453853
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2453868
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2453868
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2453853
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2453853

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2453854
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2453854
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2453854
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2453854
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2453855
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2453853
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2453868
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2453853
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2453853
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2453853
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2453854

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	11/30/2023			11/30/2023 14:20	Blanca Fach	2453853
EPA 180.1 Rev. 2.0	11/30/2023			11/30/2023 14:00	Khloe J Berg	2453853
EPA 200.7 Rev. 4.4	11/30/2023	12/01/2023 10:40	Vijayalakshmi Reddy	12/12/2023 19:08	Chase Roberts	2453868
EPA 200.8 Rev. 5.4	11/30/2023	12/01/2023 10:40	Vijayalakshmi Reddy	12/04/2023 17:35	Emily M Philpot	2453868
EPA 300.0 Rev. 2.1	11/30/2023			12/08/2023 01:23	James L Waggeberby	2453853
EPA 350.1 Rev. 2.0	11/30/2023			12/06/2023 12:17	Ping Hua	2453854
EPA 351.2 Rev. 2.0	11/30/2023	12/05/2023 11:47	Simonne.V. Calhoun	12/06/2023 11:37	Samantha L Bates	2453854
EPA 353.2 Rev. 2.0	11/30/2023			12/04/2023 14:17	Fadila Guebre	2453854
EPA 365.1 Rev. 2.0	11/30/2023	12/06/2023 13:01	Adam P Silver	12/07/2023 12:06	Chandler E Cox	2453854
EPA 365.1 Rev. 2.0 dissolved	11/30/2023			11/30/2023 15:27	Elise M. Gillis	2453855
SM 2320 B-2011	11/30/2023			12/02/2023 09:45	Dale L. Simmons	2453853
SM 2340 B-2011	11/30/2023			12/12/2023 19:08	Chase Roberts	2453868
SM 2540 C-2015	11/30/2023			12/05/2023 16:11	Yijie Li	2453853
SM 2540 D-2015	11/30/2023			12/05/2023 16:11	Yijie Li	2453853
SM 4500-F- C-2011	11/30/2023			12/02/2023 09:45	Dale L. Simmons	2453853
SM 5310 B-2011	11/30/2023			12/05/2023 18:27	Kenneth H Lee	2453854