Chemical Analysis Report

NE-DIST-2022-10-18-01

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

Event Description: **Nassau North Boat 2022**
Request ID: **RQ-2022-08-08-55**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 07-NOV-2022 08:47

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: Plummer Creek @ Second Island **Collection Date/Time: 10/17/2022 10:00**

Field ID: G4NE0301 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2362832	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P421047	
	SM 2320 B-2011	Total Alkalinity	22		mg CaCO3/L	P421169	
	SM 2540 D-2015	TSS	8	I	mg/L	P421495	
	SM 4500-F- C-2011	Fluoride	0.11		mg F/L	P421551	
2362833	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P421796	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P421286	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P421077	
	EPA 365.1 Rev. 2.0	Total-P	0.072		mg P/L	P421085	
	SM 5310 B-2011	Organic Carbon	37		mg C/L	P421130	

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

Sample Location: St Marys River @ Bend 4.5 Miles **Collection Date/Time: 10/17/2022 11:55**

Field ID: 19010131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2362834	DEP SOP: NU-094-1	Color (true)	350		PCU	P421042	
	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P421047	
	EPA 300.0 Rev. 2.1	Chloride	9.0		mg Cl/L	P421653	
		Sulfate	3.2		mg SO4/L	P421657	
	SM 2320 B-2011	Total Alkalinity	6.7		mg CaCO3/L	P421169	
	SM 2540 C-2015	TDS	95		mg/L	P421545	
	SM 2540 D-2015	TSS	3	I	mg/L	P421494	
	SM 4500-F- C-2011	Fluoride	0.053	I	mg F/L	P421551	
2362835	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P421337	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P421288	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.086		mg N/L	P421077	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P421085	
	SM 5310 B-2011	Organic Carbon	30		mg C/L	P421130	
2362843	EPA 200.7 Rev. 4.4	Calcium	6.10		mg/L	P421067	
		Iron	1.06E+03		ug/L	P421067	
		Magnesium	2.34		mg/L	P421067	
		Potassium	0.80	I	mg/L	P421067	
		Sodium	5.9		mg/L	P421067	
		Strontium	27.5		ug/L	P421067	
		Tin	3.0	U	ug/L	P421067	
		Titanium	5.0		ug/L	P421067	
		Vanadium	2.0	U	ug/L	P421067	
		Zinc	5.0	U	ug/L	P421067	
	EPA 200.8 Rev. 5.4	Aluminum	500		ug/L	P421067	
		Antimony	0.050	U	ug/L	P421067	
		Arsenic	0.51		ug/L	P421067	
		Barium	19.4		ug/L	P421067	
		Beryllium	0.032	I	ug/L	P421067	
		Boron	15.9		ug/L	P421067	
		Cadmium	0.020	U	ug/L	P421067	
		Chromium	0.75	I	ug/L	P421067	
		Cobalt	0.303		ug/L	P421067	
		Copper	0.40	U	ug/L	P421067	
		Lead	0.57		ug/L	P421067	
		Manganese	16.6		ug/L	P421067	
		Molybdenum	0.29	I	ug/L	P421067	
		Nickel	0.72	I	ug/L	P421067	
		Selenium	0.20	U	ug/L	P421067	
		Silver	0.010	U	ug/L	P421067	
		Thallium	0.10	U	ug/L	P421067	
	SM 2340 B-2011	Hardness	24.9		mg/L	P421067	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed on 11/01/2022.

Sample Location: FB **Collection Date/Time: 10/17/2022 12:00**

Field ID: FB_10172022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2362836	DEP SOP: NU-094-1	Color (true)	2.5	U	PCU	P421042	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P421047	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P421653	
		Sulfate	0.20	U	mg SO4/L	P421657	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P421169	
	SM 2540 C-2015	TDS	15	U	mg/L	P421545	
	SM 2540 D-2015	TSS	2	U	mg/L	P421494	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P421551	
2362837	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P421337	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P421288	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P421077	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P421085	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P421130	
2362844	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P421067	
		Iron	30	U	ug/L	P421067	
		Magnesium	0.040	U	mg/L	P421067	
		Potassium	0.30	U	mg/L	P421067	
		Sodium	0.50	U	mg/L	P421067	
		Strontium	2.0	U	ug/L	P421067	
		Tin	3.0	U	ug/L	P421067	
		Titanium	0.75	U	ug/L	P421067	
		Vanadium	2.0	U	ug/L	P421067	
		Zinc	5.0	U	ug/L	P421067	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P421067	
		Antimony	0.050	U	ug/L	P421067	
		Arsenic	0.050	U	ug/L	P421067	
		Barium	0.43	I	ug/L	P421067	
		Beryllium	0.010	U	ug/L	P421067	
		Boron	2.0	U	ug/L	P421067	
		Cadmium	0.020	U	ug/L	P421067	
		Chromium	0.40	U	ug/L	P421067	
		Cobalt	0.020	U	ug/L	P421067	
		Copper	0.40	U	ug/L	P421067	
		Lead	0.20	U	ug/L	P421067	
		Manganese	0.10	U	ug/L	P421067	
		Molybdenum	0.15	U	ug/L	P421067	
		Nickel	0.50	U	ug/L	P421067	
		Selenium	0.20	U	ug/L	P421067	
		Silver	0.010	U	ug/L	P421067	
		Thallium	0.10	U	ug/L	P421067	
	SM 2340 B-2011	Hardness	0.35	U	mg/L	P421067	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The barium result was confirmed in the undigested sample on 10/20/2022.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421042

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421047

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421067

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: P421067

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: P421653

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: P421657

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421337

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421796

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421286

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421288

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421077

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421085

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

Reference Method: SM 2320 B-2011
Batch ID: P421169

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

Reference Method: SM 2540 C-2015
Batch ID: P421545

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P421494

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421495

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421551

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P421130

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: P421042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421047

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	99.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421067

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	107		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	105		P	85 - 115
Sodium	107		P	85 - 115
Strontium	100		P	85 - 115
Tin	105		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421067

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.4		P	85 - 115
Antimony	99.2		P	85 - 115
Arsenic	100		P	85 - 115
Barium	103		P	85 - 115
Beryllium	88.7		P	85 - 115
Boron	106		P	85 - 115
Cadmium	96.9		P	85 - 115
Chromium	98.8		P	85 - 115
Cobalt	98.2		P	85 - 115
Copper	99.2		P	85 - 115
Lead	95.4		P	85 - 115
Manganese	98.2		P	85 - 115
Molybdenum	98.0		P	85 - 115
Nickel	99.8		P	85 - 115
Selenium	97.8		P	85 - 115
Silver	103		P	85 - 115
Thallium	92.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421653

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.8		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421657

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421337

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: P421796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421286

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421288

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421085

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

Reference Method: SM 2320 B-2011
Batch ID: P421169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P421545

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P421494

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.1		P	85 - 106

Reference Method: SM 2540 D-2015
Batch ID: P421495

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	92.7		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421551

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421130

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362790	Calcium	106		P	80 - 120
2362790	Iron	109	111	P/P	80 - 120
2362790	Magnesium	108	111	P/P	80 - 120
2362790	Potassium	109	109	P/P	80 - 120
2362790	Sodium	111	110	P/P	80 - 120
2362790	Strontium	102	103	P/P	80 - 120
2362790	Tin	102	102	P/P	80 - 120
2362790	Titanium	102	103	P/P	80 - 120
2362790	Vanadium	104	105	P/P	80 - 120
2362790	Zinc	101	102	P/P	80 - 120
2362816	Calcium	106		P	80 - 120
2362816	Iron	111		P	80 - 120
2362816	Magnesium	109		P	80 - 120
2362816	Potassium	107		P	80 - 120
2362816	Sodium	104		P	80 - 120
2362816	Strontium	104		P	80 - 120
2362816	Tin	106		P	80 - 120
2362816	Titanium	101		P	80 - 120
2362816	Vanadium	103		P	80 - 120
2362816	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362790	Aluminum	102	103	P/P	80 - 120
2362790	Antimony	106	106	P/P	80 - 120
2362790	Arsenic	105	105	P/P	80 - 120
2362790	Barium	108	108	P/P	80 - 120
2362790	Beryllium	93.4	93.7	P/P	80 - 120
2362790	Boron	110	110	P/P	80 - 120
2362790	Cadmium	104	105	P/P	80 - 120
2362790	Chromium	104	105	P/P	80 - 120
2362790	Cobalt	102	103	P/P	80 - 120
2362790	Copper	101	101	P/P	80 - 120
2362790	Lead	99.0	98.8	P/P	80 - 120
2362790	Manganese	105	105	P/P	80 - 120
2362790	Molybdenum	105	106	P/P	80 - 120
2362790	Nickel	103	104	P/P	80 - 120
2362790	Selenium	104	101	P/P	80 - 120
2362790	Silver	107	107	P/P	80 - 120
2362790	Thallium	98.7	101	P/P	80 - 120
2362816	Aluminum	94.7		P	80 - 120
2362816	Antimony	103		P	80 - 120
2362816	Arsenic	102		P	80 - 120
2362816	Barium	104		P	80 - 120
2362816	Beryllium	93.0		P	80 - 120
2362816	Boron	106		P	80 - 120
2362816	Cadmium	100		P	80 - 120
2362816	Chromium	102		P	80 - 120
2362816	Cobalt	99.1		P	80 - 120
2362816	Copper	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362816	Lead	96.7		P	80 - 120
2362816	Manganese	101		P	80 - 120
2362816	Molybdenum	98.7		P	80 - 120
2362816	Nickel	102		P	80 - 120
2362816	Selenium	99.3		P	80 - 120
2362816	Silver	102		P	80 - 120
2362816	Thallium	94.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363887	Chloride	94.8		P	90 - 110
2363888	Chloride	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363887	Sulfate	96.2		P	90 - 110
2363888	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362835	Ammonia-N	99.8	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363585	Ammonia-N	98.6	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421286

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362972	Kjeldahl Nitrogen	100	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362833	NO2NO3-N	90.0	90.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362803	Total-P	108	107	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P421551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362782	Fluoride	96.9	97.5	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362862	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362894	Color (true)	1.19	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362794	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362790	Calcium	2.16	Spike	P	0 - 20
2362790	Iron	1.28	Spike	P	0 - 20
2362790	Magnesium	1.25	Spike	P	0 - 20
2362790	Potassium	0.222	Spike	P	0 - 20
2362790	Sodium	1.04	Spike	P	0 - 20
2362790	Strontium	0.616	Spike	P	0 - 20
2362790	Tin	0.0924	Spike	P	0 - 20
2362790	Titanium	1.23	Spike	P	0 - 20
2362790	Vanadium	1.15	Spike	P	0 - 20
2362790	Zinc	1.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362790	Aluminum	0.758	Spike	P	0 - 20
2362790	Antimony	0.330	Spike	P	0 - 20
2362790	Arsenic	0.154	Spike	P	0 - 20
2362790	Barium	0.213	Spike	P	0 - 20
2362790	Beryllium	0.304	Spike	P	0 - 20
2362790	Boron	0.261	Spike	P	0 - 20
2362790	Cadmium	0.721	Spike	P	0 - 20
2362790	Chromium	0.959	Spike	P	0 - 20
2362790	Cobalt	0.307	Spike	P	0 - 20
2362790	Copper	0.357	Spike	P	0 - 20
2362790	Lead	0.131	Spike	P	0 - 20
2362790	Manganese	0.127	Spike	P	0 - 20
2362790	Molybdenum	0.873	Spike	P	0 - 20
2362790	Nickel	0.825	Spike	P	0 - 20
2362790	Selenium	2.07	Spike	P	0 - 20
2362790	Silver	0.597	Spike	P	0 - 20
2362790	Thallium	2.33	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363887	Chloride	4.04	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363887	Sulfate	5.10	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362835	Ammonia-N	1.51	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363585	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362972	Kjeldahl Nitrogen	0.220	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362751	Kjeldahl Nitrogen	5.39	Sample	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362833	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362803	Total-P	0.814	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P421169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362782	Total Alkalinity	0.791	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362934	TDS	3.92	Sample	P	0 - 10

Reference Method: SM 2540 D-2015
Batch ID: P421494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362934	TSS	6.45	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P421551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362782	Fluoride	0.477	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P421130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362862	Organic Carbon	0.606	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: A115369
Included Lab Sample IDs: 2362834, 2362836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.4	97.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A115372
Included Lab Sample IDs: 2362832, 2362834, 2362836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115384
Included Lab Sample IDs: 2362833, 2362835, 2362837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	96.0	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A115411
Included Lab Sample IDs: 2362833, 2362835, 2362837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.2	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115421
Included Lab Sample IDs: 2362832, 2362834, 2362836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	94.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115449
Included Lab Sample IDs: 2362843, 2362844

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	102	P/P	90 - 110
Aluminum	102	99.7	P/P	90 - 110
Antimony	97.8	99.6	P/P	90 - 110
Antimony	99.6	99.1	P/P	90 - 110
Arsenic	97.3	100	P/P	90 - 110
Arsenic	100	99.2	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Barium	98.5	101	P/P	90 - 110
Beryllium	93.4	93.6	P/P	90 - 110
Beryllium	93.6	95.1	P/P	90 - 110
Boron	102	103	P/P	90 - 110
Boron	103	98.9	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Cadmium	99.4	101	P/P	90 - 110
Chromium	95.6	98.5	P/P	90 - 110
Chromium	98.5	97.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115449
Included Lab Sample IDs: 2362843, 2362844

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	94.5	97.5	P/P	90 - 110
Cobalt	97.5	96.4	P/P	90 - 110
Copper	96.2	99.5	P/P	90 - 110
Copper	99.5	97.7	P/P	90 - 110
Lead	93.0	94.7	P/P	90 - 110
Lead	94.7	94.7	P/P	90 - 110
Manganese	95.9	99.3	P/P	90 - 110
Manganese	99.3	98.6	P/P	90 - 110
Molybdenum	97.8	99.3	P/P	90 - 110
Molybdenum	99.3	98.5	P/P	90 - 110
Nickel	95.8	99.2	P/P	90 - 110
Nickel	99.2	97.5	P/P	90 - 110
Selenium	101	99.5	P/P	90 - 110
Selenium	98.3	101	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Silver	99.6	102	P/P	90 - 110
Thallium	101	101	P/P	90 - 110
Thallium	101	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115452
Included Lab Sample IDs: 2362843, 2362844

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	95 - 105
Calcium	103	104	P/P	90 - 110
Iron	103	103	P/P	95 - 105
Iron	105	106	P/P	90 - 110
Magnesium	101	101	P/P	95 - 105
Magnesium	102	104	P/P	90 - 110
Potassium	101	101	P/P	95 - 105
Potassium	102	104	P/P	90 - 110
Sodium	102	102	P/P	95 - 105
Sodium	102	104	P/P	90 - 110
Strontium	96.9	96.7	P/P	95 - 105
Strontium	97.3	97.6	P/P	90 - 110
Tin	96.3	97.3	P/P	95 - 105
Tin	98.5	99.9	P/P	90 - 110
Titanium	98.0	98.4	P/P	95 - 105
Titanium	98.5	99.4	P/P	90 - 110
Vanadium	97.4	97.8	P/P	95 - 105
Vanadium	98.3	99.5	P/P	90 - 110
Zinc	95.6	96.8	P/P	95 - 105
Zinc	98.6	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115465
Included Lab Sample IDs: 2362833

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115477
Included Lab Sample IDs: 2362835, 2362837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115485
Included Lab Sample IDs: 2362835, 2362837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115503
Included Lab Sample IDs: 2362833, 2362835, 2362837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	105	P/P	90 - 110
Kjeldahl Nitrogen	103	106	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115558
Included Lab Sample IDs: 2362834, 2362836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	100	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115574
Included Lab Sample IDs: 2362832, 2362834, 2362836

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115690
Included Lab Sample IDs: 2362833

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.5	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	99.8					1.19	
EPA 180.1 Rev. 2.0	Turbidity	99.9					0.0	
EPA 200.7 Rev. 4.4	Calcium	100	106	106				2.16
	Iron	107	109	111	111			1.28
	Magnesium	107	108	111	109			1.25
	Potassium	105	109	109	107			0.222
	Sodium	107	111	110	104			1.04
	Strontium	100	102	103	104			0.616
	Tin	105	102	102	106			0.0924
	Titanium	103	102	103	101			1.23
	Vanadium	102	104	105	103			1.15
	Zinc	101	101	102	103			1.16
EPA 200.8 Rev. 5.4	Aluminum	99.4	102	103	94.7			0.758
	Antimony	99.2	106	106	103			0.330
	Arsenic	100	105	105	102			0.154
	Barium	103	108	108	104			0.213
	Beryllium	88.7	93.4	93.7	93.0			0.304
	Boron	106	110	110	106			0.261
	Cadmium	96.9	104	105	100			0.721
	Chromium	98.8	104	105	102			0.959
	Cobalt	98.2	102	103	99.1			0.307
	Copper	99.2	101	101	101			0.357
	Lead	95.4	99.0	98.8	96.7			0.131
	Manganese	98.2	105	105	101			0.127
	Molybdenum	98.0	105	106	98.7			0.873
	Nickel	99.8	103	104	102			0.825
	Selenium	97.8	104	101	99.3			2.07
	Silver	103	107	107	102			0.597
	Thallium	92.3	98.7	101	94.9			2.33
EPA 300.0 Rev. 2.1	Chloride	96.8	94.8	99.7			4.04	
	Sulfate	97.3	96.2	101			5.10	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	99.8	102				1.51
	Ammonia-N	96.2	98.6	98.6				0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	100	100				0.220
	Kjeldahl Nitrogen	104					5.39	
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	90.0	90.5				0.504
EPA 365.1 Rev. 2.0	Total-P	105	108	107				0.814
SM 2320 B-2011	Total Alkalinity	101					0.791	
SM 2540 C-2015	TDS	102					3.92	
SM 2540 D-2015	TSS	91.1					6.45	
	TSS	92.7						
SM 4500-F- C-2011	Fluoride	98.6	96.9	97.5				0.477
SM 5310 B-2011	Organic Carbon	101	102	101				0.606

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2362834, 2362836
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2362832, 2362834, 2362836
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2362843, 2362844
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2362843, 2362844

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2362834, 2362836
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2362834, 2362836
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2362833, 2362835, 2362837
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2362833, 2362835, 2362837
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2362833, 2362835, 2362837
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2362833, 2362835, 2362837
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2362832, 2362834, 2362836
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2362843, 2362844
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2362834, 2362836
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2362832, 2362834, 2362836
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2362832, 2362834, 2362836
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2362833, 2362835, 2362837

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	10/18/2022			10/18/2022 14:58	Blanca Fach	2362834, 2362836
EPA 180.1 Rev. 2.0	10/18/2022			10/18/2022 14:04	Khloe J Berg	2362832
	10/18/2022			10/18/2022 14:05	Khloe J Berg	2362834
	10/18/2022			10/18/2022 14:06	Khloe J Berg	2362836
EPA 200.7 Rev. 4.4	10/18/2022	10/19/2022 11:55	George D Taylor	10/20/2022 13:44	McKinley C Carter	2362844
	10/18/2022	10/19/2022 11:55	George D Taylor	10/20/2022 17:37	McKinley C Carter	2362843
EPA 200.8 Rev. 5.4	10/18/2022	10/19/2022 11:55	George D Taylor	10/20/2022 17:34	Emily M Philpot	2362844
	10/18/2022	10/19/2022 11:55	George D Taylor	10/20/2022 19:58	Emily M Philpot	2362843
EPA 300.0 Rev. 2.1	10/18/2022			10/28/2022 20:13	Anna M. Plaviak	2362834
	10/18/2022			10/28/2022 20:28	Anna M. Plaviak	2362836
EPA 350.1 Rev. 2.0	10/18/2022			10/24/2022 16:08	Judith K. Clark	2362835
	10/18/2022			10/24/2022 16:12	Judith K. Clark	2362837
	10/18/2022			11/02/2022 13:34	Ping Hua	2362833
EPA 351.2 Rev. 2.0	10/18/2022	10/24/2022 14:48	Samantha L Bates	10/25/2022 11:06	Samantha L Bates	2362833
	10/18/2022	10/24/2022 14:48	Samantha L Bates	10/25/2022 12:11	Samantha L Bates	2362835
	10/18/2022	10/24/2022 14:48	Samantha L Bates	10/25/2022 12:13	Samantha L Bates	2362837
EPA 353.2 Rev. 2.0	10/18/2022			10/19/2022 10:24	Beverly Y. Sanders	2362833
	10/18/2022			10/19/2022 10:26	Beverly Y. Sanders	2362835
	10/18/2022			10/19/2022 10:27	Beverly Y. Sanders	2362837
EPA 365.1 Rev. 2.0	10/18/2022	10/20/2022 15:06	Adam P Silver	10/23/2022 13:02	James L Waggerby	2362833
	10/18/2022	10/20/2022 15:06	Adam P Silver	10/24/2022 10:20	James L Waggerby	2362837
	10/18/2022	10/20/2022 15:06	Adam P Silver	10/24/2022 10:25	James L Waggerby	2362835
SM 2320 B-2011	10/18/2022			10/20/2022 04:45	Dale L. Simmons	2362834
	10/18/2022			10/20/2022 04:54	Dale L. Simmons	2362836
	10/18/2022			10/20/2022 05:07	Dale L. Simmons	2362832
SM 2340 B-2011	10/18/2022			10/20/2022 13:44	McKinley C Carter	2362844
	10/18/2022			10/20/2022 17:37	McKinley C Carter	2362843
SM 2540 C-2015	10/18/2022			10/19/2022 16:26	Yijie Li	2362834, 2362836
SM 2540 D-2015	10/18/2022			10/19/2022 16:26	Yijie Li	2362832, 2362834, 2362836
SM 4500-F- C-2011	10/18/2022			10/27/2022 01:00	Dale L. Simmons	2362834
	10/18/2022			10/27/2022 01:05	Dale L. Simmons	2362836
	10/18/2022			10/27/2022 01:10	Dale L. Simmons	2362832
SM 5310 B-2011	10/18/2022			10/20/2022 05:28	Khloe J Berg	2362833
	10/18/2022			10/20/2022 05:42	Khloe J Berg	2362835
	10/18/2022			10/20/2022 05:56	Khloe J Berg	2362837