

Chemical Analysis Report

SO-DIST-2022-05-06-01

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

Event Description: **2022 SMP : Charlotte Harbor**
Request ID: **RQ-2022-05-02-67**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
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Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 31-MAY-2022 10:22



NON-CONFORMANCE REPORT INCLUDED

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: Myakka River West

Collection Date/Time: 05/04/2022 10:30

Field ID: G3SD0219

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325207	EPA 180.1 Rev. 2.0	Turbidity	2.7	A	NTU	P413524	
	SM 2320 B-2011	Total Alkalinity	109		mg CaCO3/L	P413854	
	SM 2540 D-2011	TSS	4	I	mg/L	P413957	
	SM 4500-F- C-2011	Fluoride	0.91		mg F/L	P413859	
2325208	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P413962	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P414006	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P413886	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P413897	
	SM 5310 B-2011	Organic Carbon	9.4		mg C/L	P413888	

Ref. Method and Comment:

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

Sample Location: Myakka Cutoff (Western Portion)

Collection Date/Time: 05/04/2022 09:25

Field ID: G3SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325203	SM 2320 B-2011	Total Alkalinity	116		mg CaCO3/L	P413854	
	SM 2540 D-2011	TSS	5	IA	mg/L	P413956	
	SM 4500-F- C-2011	Fluoride	1.1		mg F/L	P413859	
2325205	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P413962	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P413870	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P413885	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P413690	
	SM 5310 B-2011	Organic Carbon	8.0		mg C/L	P413888	

Ref. Method and Comment:

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

Sample Location: Trailer Park Canal

Collection Date/Time: 05/04/2022 11:10

Field ID: G3SD0072

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325226	EPA 200.7 Rev. 4.4	Calcium	336		mg/L	P413782	
		Iron	120	U	ug/L	P413782	
		Magnesium	1.02E+03		mg/L	P413782	
		Strontium	7.39E+03		ug/L	P413782	
		Tin	150	U	ug/L	P413782	
		Vanadium	8.0	U	ug/L	P413782	
	EPA 200.8 Rev. 5.4	Zinc	20	U	ug/L	P413782	
		Aluminum	42	I	ug/L	P413782	
		Antimony	0.22	I	ug/L	P413782	
		Arsenic	2.15		ug/L	P413782	
		Beryllium	0.040	U	ug/L	P413782	
		Cadmium	0.080	U	ug/L	P413782	
		Chromium	1.6	U	ug/L	P413782	
		Cobalt	0.20	I	ug/L	P413782	
		Copper	1.6	U	ug/L	P413782	
		Lead	2.0	U	ug/L	P413782	
		Manganese	10.6		ug/L	P413782	
		Molybdenum	8.5		ug/L	P413782	
		Nickel	2.0	U	ug/L	P413782	
		Selenium	0.80	U	ug/L	P413782	
		Silver	0.040	U	ug/L	P413782	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium and strontium are unavailable because of high analyte concentration in the QC sample. Precision data and spike recoveries for tin are unavailable because sample matrix interference necessitated a high dilution.

Sample Location: Tippecanoe Bay North

Collection Date/Time: 05/04/2022 09:55

Field ID: G3SD0218

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325204	SM 2320 B-2011	Total Alkalinity	103		mg CaCO3/L	P413854	
	SM 2540 D-2011	TSS	7	IA	mg/L	P413957	
	SM 4500-F- C-2011	Fluoride	0.95		mg F/L	P413859	
2325206	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P413962	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P413873	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P413886	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P413690	
	SM 5310 B-2011	Organic Carbon	8.4		mg C/L	P413888	

Ref. Method and Comment:

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

Sample Location: FB

Collection Date/Time: 05/04/2022 11:35

Field ID: FB_05042022

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325209	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P413524	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P413855	
	SM 2540 D-2011	TSS	2	U	mg/L	P413953	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P413860	
2325210	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P413902	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P413875	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P413930	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P413693	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P413881	

Ref. Method and Comment:

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

Non-Conformance Report

NCR ID: 9369

Event(s)

SO-DIST-2022-05-06-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived late, samples received within the acceptable temperature range.

Resolution: Customer contacted, email correspondence attached to sample submittal forms.
Biology and Chemistry supervisors were notified by email.
Samples logged in based on SMP Protocol.

Authorized by/Date: Kyle Klug 5/9/2022

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413524

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413782

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
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413782

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
Silver	0.010	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413962

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413870

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413873

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413875

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414006

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413885

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413886

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413930

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413690

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413693

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413897

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P413854

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2320 B-2011
Batch ID: P413855

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 D-2011
Batch ID: P413953

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413956

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413957

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413859

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413860

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P413881

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

Reference Method: SM 5310 B-2011
Batch ID: P413888

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P413524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P413782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	98.0		P	85 - 115
Iron	100		P	85 - 115
Magnesium	97.3		P	85 - 115
Strontium	99.6		P	85 - 115
Tin	97.6		P	85 - 115
Vanadium	93.4		P	85 - 115
Zinc	96.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P413782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.4		P	85 - 115
Antimony	99.9		P	85 - 115
Arsenic	98.5		P	85 - 115
Beryllium	88.4		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	95.7		P	85 - 115
Cobalt	97.4		P	85 - 115
Copper	95.9		P	85 - 115
Lead	101		P	85 - 115
Manganese	97.0		P	85 - 115
Molybdenum	99.5		P	85 - 115
Nickel	97.4		P	85 - 115
Selenium	96.5		P	85 - 115
Silver	98.2		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413902

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413962

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P413870

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413873

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413875

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414006

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413885

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413886

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413930

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413690

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413693

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413897

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P413854

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.0		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P413855

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413859

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	96 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P413860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P413881

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

Reference Method: SM 5310 B-2011
Batch ID: P413888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325226	Iron	100	98.5	P/P	70 - 130
2325226	Vanadium	95.9	96.1	P/P	70 - 130
2325226	Zinc	90.9	90.6	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325226	Aluminum	110	111	P/P	70 - 130
2325226	Antimony	99.0	100	P/P	70 - 130
2325226	Arsenic	108	109	P/P	70 - 130
2325226	Beryllium	102	106	P/P	70 - 130
2325226	Cadmium	90.2	88.4	P/P	70 - 130
2325226	Chromium	96.6	96.0	P/P	70 - 130
2325226	Cobalt	113	112	P/P	70 - 130
2325226	Copper	103	103	P/P	70 - 130
2325226	Lead	111	123	P/P	70 - 130
2325226	Manganese	96.8	96.6	P/P	70 - 130
2325226	Molybdenum	103	104	P/P	70 - 130
2325226	Nickel	114	115	P/P	70 - 130
2325226	Selenium	95.4	95.2	P/P	70 - 130
2325226	Silver	85.0	85.2	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325169	Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325687	Ammonia-N	105	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413870

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324662	Kjeldahl Nitrogen	99.0	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324667	Kjeldahl Nitrogen	97.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413875

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324851	Kjeldahl Nitrogen	104	107	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325208	Kjeldahl Nitrogen	91.2	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324871	NO2NO3-N	95.0	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325206	NO2NO3-N	97.8	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413930

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325160	NO2NO3-N	98.5	97.2	P/P	90 - 110
2325160	NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324672	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413693

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325267	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413897

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325546	Total-P	95.6	96.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P413859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323905	Fluoride	98.4	98.4	P/P	94 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P413860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325326	Fluoride	100	100	P/P	94 - 104

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P413881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325275	Organic Carbon	95.1	95.0	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P413888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323910	Organic Carbon	95.0	96.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325207	Turbidity	10.7	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325226	Calcium	0.399	Spike	P	0 - 20
2325226	Iron	1.61	Spike	P	0 - 20
2325226	Magnesium	1.04	Spike	P	0 - 20
2325226	Strontium	0.375	Spike	P	0 - 20
2325226	Vanadium	0.231	Spike	P	0 - 20
2325226	Zinc	0.279	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325226	Aluminum	0.199	Spike	P	0 - 20
2325226	Antimony	1.14	Spike	P	0 - 20
2325226	Arsenic	1.07	Spike	P	0 - 20
2325226	Beryllium	3.88	Spike	P	0 - 20
2325226	Cadmium	2.01	Spike	P	0 - 20
2325226	Chromium	0.614	Spike	P	0 - 20
2325226	Cobalt	1.26	Spike	P	0 - 20
2325226	Copper	0.166	Spike	P	0 - 20
2325226	Lead	10.0	Spike	P	0 - 20
2325226	Manganese	0.209	Spike	P	0 - 20
2325226	Molybdenum	0.503	Spike	P	0 - 20
2325226	Nickel	0.843	Spike	P	0 - 20
2325226	Selenium	0.260	Spike	P	0 - 20
2325226	Silver	0.200	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325169	Ammonia-N	0.553	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325687	Ammonia-N	0.982	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413870

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324662	Kjeldahl Nitrogen	4.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324667	Kjeldahl Nitrogen	0.226	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413875

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324851	Kjeldahl Nitrogen	2.70	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325208	Kjeldahl Nitrogen	2.97	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324871	NO2NO3-N	0.498	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325206	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325160	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324672	Total-P	1.17	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325267	Total-P	0.186	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325546	Total-P	1.40	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323905	Total Alkalinity	2.60	Sample	P	0 - 3.8

Reference Method: SM 2320 B-2011
Batch ID: P413855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325326	Total Alkalinity	1.71	Sample	P	0 - 3.8

Reference Method: SM 4500-F- C-2011
Batch ID: P413859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323905	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 4500-F- C-2011
Batch ID: P413860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325326	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P413881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325275	Organic Carbon	0.0888	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P413888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323910	Organic Carbon	1.36	Spike	P	0 - 20

Quality Assurance Report Precision

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A111976

Included Lab Sample IDs: 2325207, 2325209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	98.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112132

Included Lab Sample IDs: 2325205, 2325206

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A112151

Included Lab Sample IDs: 2325226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.1	96.0	P/P	90 - 110
Iron	97.9	97.7	P/P	90 - 110
Magnesium	96.6	95.9	P/P	90 - 110
Strontium	98.9	102	P/P	90 - 110
Tin	97.5	95.8	P/P	90 - 110
Vanadium	97.8	99.0	P/P	90 - 110
Zinc	95.3	97.8	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A112155

Included Lab Sample IDs: 2325203, 2325204, 2325207, 2325209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.5	98.8	P/P	90 - 110
Total Alkalinity	97.7	96.5	P/P	90 - 110
Total Alkalinity	98.8	95.2	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A112155

Included Lab Sample IDs: 2325203, 2325204, 2325207, 2325209

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112156

Included Lab Sample IDs: 2325210

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A112167

Included Lab Sample IDs: 2325210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.7	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112169

Included Lab Sample IDs: 2325205, 2325206, 2325208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A112170

Included Lab Sample IDs: 2325205, 2325206, 2325208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	97.2	P/P	90 - 110
Organic Carbon	97.2	94.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112183

Included Lab Sample IDs: 2325210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112184

Included Lab Sample IDs: 2325226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	100	P/P	90 - 110
Antimony	97.5	101	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Beryllium	98.9	102	P/P	90 - 110
Cadmium	96.4	98.0	P/P	90 - 110
Chromium	95.8	97.0	P/P	90 - 110
Cobalt	102	99.7	P/P	90 - 110
Copper	102	99.9	P/P	90 - 110
Lead	99.9	99.0	P/P	90 - 110
Manganese	97.2	98.9	P/P	90 - 110
Nickel	103	101	P/P	90 - 110
Selenium	98.1	100	P/P	90 - 110
Silver	98.0	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112196

Included Lab Sample IDs: 2325210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112197

Included Lab Sample IDs: 2325226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Molybdenum	97.0	94.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112204

Included Lab Sample IDs: 2325205, 2325206, 2325208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112260

Included Lab Sample IDs: 2325208

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112268

Included Lab Sample IDs: 2325205

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112278

Included Lab Sample IDs: 2325210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.3	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112291

Included Lab Sample IDs: 2325206

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112314

Included Lab Sample IDs: 2325208

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity	95.5				10.7	
EPA 200.7 Rev. 4.4	Calcium	98.0					0.399
	Iron	100	100	98.5			1.61
	Magnesium	97.3					1.04
	Strontium	99.6					0.375
	Tin	97.6					
	Vanadium	93.4	95.9	96.1			0.231
	Zinc	96.7	90.9	90.6			0.279
EPA 200.8 Rev. 5.4	Aluminum	98.4	110	111			0.199
	Antimony	99.9	99.0	100			1.14
	Arsenic	98.5	108	109			1.07
	Beryllium	88.4	102	106			3.88
	Cadmium	98.3	90.2	88.4			2.01
	Chromium	95.7	96.6	96.0			0.614
	Cobalt	97.4	113	112			1.26
	Copper	95.9	103	103			0.166
	Lead	101	111	123			10.0
	Manganese	97.0	96.8	96.6			0.209
	Molybdenum	99.5	103	104			0.503
	Nickel	97.4	114	115			0.843
	Selenium	96.5	95.4	95.2			0.260
	Silver	98.2	85.0	85.2			0.200
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	101	99.6			0.553
	Ammonia-N	100	105	106			0.982
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	99.0	105			4.47
	Kjeldahl Nitrogen	103	97.8	97.5			0.226
	Kjeldahl Nitrogen	95.5	104	107			2.70
	Kjeldahl Nitrogen	98.3	91.2	95.1			2.97
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	95.0	95.6			0.498
	NO ₂ NO ₃ -N	96.0	97.8	98.3			0.494
	NO ₂ NO ₃ -N	98.5	98.5	98.5	97.2		0.0
EPA 365.1 Rev. 2.0	Total-P	101	101	102			1.17
	Total-P	101	102	102			0.186
	Total-P	101	95.6	96.9			1.40
SM 2320 B-2011	Total Alkalinity	98.0				2.60	
	Total Alkalinity	99.6				1.71	
SM 4500-F- C-2011	Fluoride	99.3	98.4	98.4			0.0
	Fluoride	100	100	100			0.0
SM 5310 B-2011	Organic Carbon	94.6	95.1	95.0			0.0888
	Organic Carbon	92.1	95.0	96.3			1.36

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2325207, 2325209
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2325226
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2325226
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2325205, 2325206, 2325208, 2325210
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2325205, 2325206, 2325208, 2325210
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2325205, 2325206, 2325208, 2325210
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2325205, 2325206, 2325208, 2325210

Reference Method Descriptions

Method	Description	Associated Samples
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2325203, 2325204, 2325207, 2325209
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2325203, 2325204, 2325207, 2325209
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2325203, 2325204, 2325207, 2325209
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2325205, 2325206, 2325208, 2325210

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/06/2022			05/06/2022 10:20	Khloe J Berg	2325207
	05/06/2022			05/06/2022 10:24	Khloe J Berg	2325209
EPA 200.7 Rev. 4.4	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/13/2022 22:08	McKinley C Carter	2325226
	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/13/2022 23:12	McKinley C Carter	2325226
EPA 200.8 Rev. 5.4	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/16/2022 19:28	Alexander Thompson	2325226
	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/16/2022 21:13	Alexander Thompson	2325226
	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/17/2022 11:31	Alexander Thompson	2325226
	05/06/2022	05/13/2022 09:55	Megan Whitefoot	05/16/2022 14:08	Judith K. Clark	2325210
EPA 350.1 Rev. 2.0	05/06/2022			05/17/2022 12:03	Ping Hua	2325205
	05/06/2022			05/17/2022 12:04	Ping Hua	2325206
	05/06/2022			05/17/2022 12:06	Ping Hua	2325208
	05/06/2022	05/17/2022 14:29	Samantha L Bates	05/19/2022 11:17	Samantha L Bates	2325205
EPA 351.2 Rev. 2.0	05/06/2022	05/18/2022 12:24	Samantha L Bates	05/19/2022 16:59	Samantha L Bates	2325210
	05/06/2022	05/18/2022 12:24	Samantha L Bates	05/20/2022 11:16	Samantha L Bates	2325206
	05/06/2022	05/19/2022 15:12	Samantha L Bates	05/20/2022 14:00	Samantha L Bates	2325208
	05/06/2022			05/16/2022 10:40	Beverly Y. Sanders	2325205
EPA 353.2 Rev. 2.0	05/06/2022			05/16/2022 10:47	Beverly Y. Sanders	2325206
	05/06/2022			05/16/2022 10:53	Beverly Y. Sanders	2325208
	05/06/2022			05/17/2022 10:35	Beverly Y. Sanders	2325210
	05/06/2022	05/12/2022 16:34	Simonne.V. Calhoun	05/13/2022 12:53	Sarah A Nixon	2325205
EPA 365.1 Rev. 2.0	05/06/2022	05/12/2022 16:34	Simonne.V. Calhoun	05/13/2022 12:56	Sarah A Nixon	2325206
	05/06/2022	05/12/2022 16:34	Simonne.V. Calhoun	05/13/2022 16:49	James L Waggeberby	2325210
	05/06/2022	05/17/2022 14:42	Simonne.V. Calhoun	05/18/2022 19:54	Sarah A Nixon	2325208
	05/06/2022			05/14/2022 12:18	Dale L. Simmons	2325203
SM 2320 B-2011	05/06/2022			05/14/2022 12:31	Dale L. Simmons	2325204
	05/06/2022			05/14/2022 13:25	Dale L. Simmons	2325207
	05/06/2022			05/14/2022 16:53	Dale L. Simmons	2325209
	05/06/2022			05/09/2022 13:28	Yijie Li	2325203, 2325204, 2325207, 2325209
SM 2540 D-2011	05/06/2022			05/14/2022 09:25	Dale L. Simmons	2325203
SM 4500-F- C-2011	05/06/2022			05/14/2022 10:02	Dale L. Simmons	2325204
	05/06/2022			05/14/2022 10:07	Dale L. Simmons	2325207
	05/06/2022			05/14/2022 16:53	Dale L. Simmons	2325209
	05/06/2022			05/11/2022 18:05	Judith K. Clark	2325205
SM 5310 B-2011	05/06/2022			05/11/2022 19:21	Judith K. Clark	2325206
	05/06/2022			05/11/2022 19:39	Judith K. Clark	2325208
	05/06/2022			05/13/2022 22:42	Khloe J Berg	2325210
	05/06/2022					