

Chemical Analysis Report

SE-DIST-2019-10-02-01

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

Event Description: **SMP-Nice Lakes**
Request ID: **RQ-2019-09-30-77**
Customer: **SE-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 22-OCT-2019 13:00



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: West Branch North Fork Lox @ JD Park

Collection Date/Time: 10/01/2019 11:30

Field ID: G2SE0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2124025	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P371734	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P372204	
		Sulfate	1.4		mg SO4/L	P372208	
	SM 2120 B	Color (true)	290		PCU	P371765	
	SM 2320 B-97	Total Alkalinity	46		mg CaCO3/L	P371996	
	SM 2540 C-97	TDS	163		mg/L	P372411	
	SM 2540 D-97	TSS	2	U	mg/L	P372391	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P371998	
2124027	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P372059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P371836	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P371786	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P371827	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P371896	
2124029	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P371782	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Warner Creek @ Jensen Beach Elementary

Collection Date/Time: 10/01/2019 13:10

Field ID: G2SE0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2124022	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P371734	
	EPA 300.0 Rev. 2.1	Chloride	52		mg Cl/L	P372204	
		Sulfate	8.1		mg SO4/L	P372208	
		Color (true)	150		PCU	P371765	
	SM 2320 B-97	Total Alkalinity	55		mg CaCO3/L	P371986	
	SM 2540 C-97	TDS	191		mg/L	P372411	
	SM 2540 D-97	TSS	3	I	mg/L	P372391	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P371989	
2124023	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P372059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P371804	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P371786	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P371827	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P371896	
2124024	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P371781	
2124050	EPA 200.7 Rev. 4.4	Barium	7.4		ug/L	P371821	
		Calcium	26.5		mg/L	P371821	
		Iron	160		ug/L	P371821	
		Magnesium	2.91		mg/L	P371821	
		Potassium	1.6		mg/L	P371821	
		Sodium	32.8		mg/L	P371821	
		Zinc	5.0	U	ug/L	P371821	
	EPA 200.8 Rev. 5.4	Aluminum	217		ug/L	P371821	
		Antimony	0.099	I	ug/L	P371821	
		Arsenic	0.64		ug/L	P371821	
		Boron**	50.8		ug/L	P371821	
		Cadmium	0.020	U	ug/L	P371821	
		Chromium	1.0	I	ug/L	P371821	
		Copper	0.68	I	ug/L	P371821	
		Lead	0.31	I	ug/L	P371821	
		Nickel	0.50	U	ug/L	P371821	
		Selenium	0.20	U	ug/L	P371821	
		Silver	0.010	U	ug/L	P371821	
		Thallium	0.10	U	ug/L	P371821	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Five-Mile Creek @ Kirby Loop

Collection Date/Time: 10/01/2019 15:10

Field ID: G2SE0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2124059	EPA 180.1 Rev. 2.0	Turbidity	5.4	A	NTU	P371734	
	EPA 300.0 Rev. 2.1	Chloride	270		mg Cl/L	P372204	
		Sulfate	96		mg SO4/L	P372208	
	SM 2120 B	Color (true)	47		PCU	P371765	
	SM 2320 B-97	Total Alkalinity	231		mg CaCO3/L	P371996	
	SM 2540 C-97	TDS	790		mg/L	P372411	
	SM 2540 D-97	TSS	2	I	mg/L	P372391	
	SM 4500 F-C-97	Fluoride	0.46		mg F/L	P371998	
2124060	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P372059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P371836	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.055		mg N/L	P371786	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P371827	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P371896	
2124061	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.093		mg P/L	P371782	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P371734

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371821

Component	Result	Code	Units
Barium	1.0	U	ug/L
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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371821

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	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: P372204

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372208

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372059

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371804

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371836

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371786

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371827

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371781

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371782

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

Reference Method: SM 2120 B
Batch ID: P371765

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P371986

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

Reference Method: SM 2320 B-97
Batch ID: P371996

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P372411

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P372391

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371989

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P371998

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P371896

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371821

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	106		P	85 - 115
Iron	111		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	107		P	85 - 115
Sodium	112		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371821

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	103		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	99.8		P	85 - 115
Copper	103		P	85 - 115
Lead	103		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	102		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372204

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372208

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372059

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371804

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371836

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371786

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371827

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371782

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

Reference Method: SM 2120 B
Batch ID: P371765

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P371986

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 2320 B-97
Batch ID: P371996

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P371989

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P371998

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P371896

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123929	Barium	99.2		P	80 - 120
2123929	Calcium	103		P	80 - 120
2123929	Iron	107		P	80 - 120
2123929	Magnesium	102		P	80 - 120
2123929	Potassium	103		P	80 - 120
2123929	Sodium	105		P	80 - 120
2123929	Zinc	98.6		P	80 - 120
2124134	Barium	103	103	P/P	80 - 120
2124134	Calcium	105		P	80 - 120
2124134	Iron	109	109	P/P	80 - 120
2124134	Magnesium	111	111	P/P	80 - 120
2124134	Potassium	110	111	P/P	80 - 120
2124134	Sodium	113	112	P/P	80 - 120
2124134	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123929	Aluminum	103		P	80 - 120
2123929	Antimony	103		P	80 - 120
2123929	Arsenic	104		P	80 - 120
2123929	Boron	103		P	80 - 120
2123929	Cadmium	97.5		P	80 - 120
2123929	Chromium	99.7		P	80 - 120
2123929	Copper	101		P	80 - 120
2123929	Lead	104		P	80 - 120
2123929	Nickel	100		P	80 - 120
2123929	Selenium	105		P	80 - 120
2123929	Silver	99.6		P	80 - 120
2123929	Thallium	107		P	80 - 120
2124134	Aluminum	101	101	P/P	80 - 120
2124134	Antimony	105	103	P/P	80 - 120
2124134	Arsenic	104	104	P/P	80 - 120
2124134	Boron	106	105	P/P	80 - 120
2124134	Cadmium	100	99.9	P/P	80 - 120
2124134	Chromium	103	102	P/P	80 - 120
2124134	Copper	100	99.5	P/P	80 - 120
2124134	Lead	104	103	P/P	80 - 120
2124134	Nickel	101	101	P/P	80 - 120
2124134	Selenium	102	103	P/P	80 - 120
2124134	Silver	102	101	P/P	80 - 120
2124134	Thallium	106	107	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123965	Chloride	102		P	90 - 110
2124102	Chloride	99.0		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372208

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123965	Sulfate	103		P	90 - 110
2124102	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123961	Ammonia-N	98.8	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371804

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124013	Kjeldahl Nitrogen	98.8	92.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371836

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124060	Kjeldahl Nitrogen	101	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371786

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124023	NO2NO3-N	99.9	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124060	Total-P	94.2	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123880	O-Phosphate-P	93.5	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124070	O-Phosphate-P	94.1	94.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124542	Fluoride	94.7	94.7	P/P	89 - 106

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P371896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124060	Organic Carbon	93.8	91.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P371734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124059	Turbidity	6.48	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124134	Barium	0.242	Spike	P	0 - 20
2124134	Calcium	0.589	Spike	P	0 - 20
2124134	Iron	0.300	Spike	P	0 - 20
2124134	Magnesium	0.110	Spike	P	0 - 20
2124134	Potassium	0.126	Spike	P	0 - 20
2124134	Sodium	0.776	Spike	P	0 - 20
2124134	Zinc	0.182	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124134	Aluminum	0.478	Spike	P	0 - 20
2124134	Antimony	1.33	Spike	P	0 - 20
2124134	Arsenic	0.570	Spike	P	0 - 20
2124134	Boron	0.443	Spike	P	0 - 20
2124134	Cadmium	0.0139	Spike	P	0 - 20
2124134	Chromium	1.05	Spike	P	0 - 20
2124134	Copper	0.823	Spike	P	0 - 20
2124134	Lead	1.16	Spike	P	0 - 20
2124134	Nickel	0.561	Spike	P	0 - 20
2124134	Selenium	1.51	Spike	P	0 - 20
2124134	Silver	1.30	Spike	P	0 - 20
2124134	Thallium	0.304	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123965	Chloride	0.638	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P372208

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123965	Sulfate	2.33	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123961	Ammonia-N	0.216	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371804

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124013	Kjeldahl Nitrogen	4.95	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124060	Kjeldahl Nitrogen	2.81	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371786

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124023	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124060	Total-P	4.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123880	O-Phosphate-P	1.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124070	O-Phosphate-P	0.185	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P371765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124012	Color (true)	1.17	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P371986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123854	Total Alkalinity	0.407	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P371996

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124542	Total Alkalinity	0.583	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P372411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124012	TDS	1.60	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P371989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123854	Fluoride	0.480	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P371998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124542	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P371896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124060	Organic Carbon	1.85	Spike	P	0 - 20

* 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: A94664

Included Lab Sample IDs: 2124022, 2124025, 2124059

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A94674

Included Lab Sample IDs: 2124022, 2124025, 2124059

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	105	P/P	90 - 115
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94681

Included Lab Sample IDs: 2124024, 2124029, 2124061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94685

Included Lab Sample IDs: 2124023, 2124027, 2124060

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

Reference Method: SM 5310 B-00

Run ID: A94723

Included Lab Sample IDs: 2124023, 2124027, 2124060

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	104	P/P	90 - 110
Organic Carbon	94.0	93.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94725

Included Lab Sample IDs: 2124060

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94739

Included Lab Sample IDs: 2124050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	107	P/P	90 - 110
Calcium	103	105	P/P	90 - 110
Iron	104	105	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	102	105	P/P	90 - 110
Sodium	104	109	P/P	90 - 110
Zinc	99.7	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94749

Included Lab Sample IDs: 2124023, 2124027, 2124060

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.3	99.9	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94754

Included Lab Sample IDs: 2124022

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

Reference Method: SM 4500 F-C-97

Run ID: A94754

Included Lab Sample IDs: 2124022

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94756

Included Lab Sample IDs: 2124023, 2124027

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

Reference Method: SM 2320 B-97

Run ID: A94757

Included Lab Sample IDs: 2124025, 2124059

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

Reference Method: SM 4500 F-C-97

Run ID: A94757

Included Lab Sample IDs: 2124025, 2124059

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	100	P/P	90 - 110
Fluoride	99.5	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94775

Included Lab Sample IDs: 2124023, 2124027, 2124060

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94830

Included Lab Sample IDs: 2124022, 2124025, 2124059

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94830

Included Lab Sample IDs: 2124022, 2124025, 2124059

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	102	102	P/P	90 - 110
Sulfate	103	103	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94947

Included Lab Sample IDs: 2124050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	103	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	104	104	P/P	90 - 110
Boron	105	106	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	101	103	P/P	90 - 110
Copper	104	105	P/P	90 - 110
Lead	105	105	P/P	90 - 110
Nickel	103	104	P/P	90 - 110
Silver	99.0	99.5	P/P	90 - 110
Thallium	99.5	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94978

Included Lab Sample IDs: 2124050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.48	
EPA 200.7 Rev. 4.4	Barium	103	99.2	103	103			0.242
	Calcium	106	103	105				0.589
	Iron	111	107	109	109			0.300
	Magnesium	113	102	111	111			0.110
	Potassium	107	103	110	111			0.126
	Sodium	112	105	113	112			0.776
	Zinc	100	98.6	101	102			0.182
EPA 200.8 Rev. 5.4	Aluminum	100	103	101	101			0.478
	Antimony	102	103	105	103			1.33
	Arsenic	103	104	104	104			0.570
	Boron	101	103	106	105			0.443
	Cadmium	99.0	97.5	100	99.9			0.0139
	Chromium	99.8	99.7	103	102			1.05
	Copper	103	101	100	99.5			0.823
	Lead	103	104	104	103			1.16
	Nickel	102	100	101	101			0.561
	Selenium	101	105	102	103			1.51
	Silver	102	99.6	102	101			1.30
	Thallium	103	107	106	107			0.304
EPA 300.0 Rev. 2.1	Chloride	102	102	99.0			0.638	
	Sulfate	103	103	102			2.33	
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.8	99.0				0.216
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.8	98.8	92.6				4.95
	Kjeldahl Nitrogen	97.3	101	96.8				2.81
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	99.9	99.9				0.0
EPA 365.1 Rev. 2.0	Total-P	95.7	94.2	100				4.23
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	93.5	94.6				1.12
	O-Phosphate-P	101	94.1	94.3				0.185
SM 2120 B	Color (true)	102					1.17	
SM 2320 B-97	Total Alkalinity	103					0.407	
	Total Alkalinity	103					0.583	
SM 2540 C-97	TDS						1.60	
SM 4500 F-C-97	Fluoride	98.2						0.480
	Fluoride	96.2	94.7	94.7				0.0
SM 5310 B-00	Organic Carbon	94.6	93.8	91.1				1.85

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2124022, 2124025, 2124059
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2124050
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2124050
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2124022, 2124025, 2124059
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2124022, 2124025, 2124059
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2124023, 2124027, 2124060
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2124023, 2124027, 2124060

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2124023, 2124027, 2124060
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2124023, 2124027, 2124060
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2124024, 2124029, 2124061
SM 2120 B / E31780	True Color measured at 450 nm	2124022, 2124025, 2124059
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2124022, 2124025, 2124059
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2124022, 2124025, 2124059
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2124022, 2124025, 2124059
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2124022, 2124025, 2124059
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2124023, 2124027, 2124060

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	10/02/2019			10/02/2019 17:19	Rosalyn Ballman	2124022, 2124025, 2124059
EPA 200.7 Rev. 4.4	10/02/2019	10/03/2019 15:15	Elliott D. Healy	10/04/2019 15:15	Alexander Thompson	2124050
EPA 200.8 Rev. 5.4	10/02/2019	10/03/2019 15:15	Elliott D. Healy	10/14/2019 23:37	Robert K Palmer	2124050
	10/02/2019	10/03/2019 15:15	Elliott D. Healy	10/16/2019 00:41	Robert K Palmer	2124050
EPA 300.0 Rev. 2.1	10/02/2019			10/08/2019 13:42	Jhamieka S. Greenwood	2124022
	10/02/2019			10/08/2019 14:19	Jhamieka S. Greenwood	2124025
	10/02/2019			10/08/2019 14:31	Jhamieka S. Greenwood	2124059
EPA 350.1 Rev. 2.0	10/02/2019			10/07/2019 14:40	Ping Hua	2124023
	10/02/2019			10/07/2019 14:41	Ping Hua	2124027
	10/02/2019			10/07/2019 14:43	Ping Hua	2124060
EPA 351.2 Rev. 2.0	10/02/2019	10/03/2019 12:50	Sima Feizi	10/04/2019 22:27	Julia Storbeck	2124023
	10/02/2019	10/03/2019 12:50	Sima Feizi	10/04/2019 22:32	Julia Storbeck	2124060
	10/02/2019	10/03/2019 12:50	Sima Feizi	10/04/2019 22:36	Julia Storbeck	2124027
EPA 353.2 Rev. 2.0	10/02/2019			10/03/2019 09:32	Beverly Y. Sanders	2124023
	10/02/2019			10/03/2019 09:33	Beverly Y. Sanders	2124027
	10/02/2019			10/03/2019 09:35	Beverly Y. Sanders	2124060
EPA 365.1 Rev. 2.0	10/02/2019	10/03/2019 12:34	Vijayalakshmi Reddy	10/04/2019 10:36	Lipi Saha	2124060
	10/02/2019	10/03/2019 12:34	Vijayalakshmi Reddy	10/04/2019 13:34	Lipi Saha	2124023, 2124027
EPA 365.1 Rev. 2.0 dissolved	10/02/2019			10/02/2019 16:11	Virginia P. Brown	2124024
	10/02/2019			10/02/2019 16:12	Virginia P. Brown	2124029
	10/02/2019			10/02/2019 16:13	Virginia P. Brown	2124061
SM 2120 B	10/02/2019			10/02/2019 18:54	Madeline Funaro	2124022
	10/02/2019			10/02/2019 18:55	Madeline Funaro	2124059
	10/02/2019			10/02/2019 19:36	Madeline Funaro	2124025
SM 2320 B-97	10/02/2019			10/03/2019 22:16	Dale L. Simmons	2124022
	10/02/2019			10/05/2019 05:40	Dale L. Simmons	2124025
	10/02/2019			10/05/2019 09:01	Dale L. Simmons	2124059
SM 2540 C-97	10/02/2019			10/04/2019 14:37	Yijie Li	2124022, 2124025, 2124059
SM 2540 D-97	10/02/2019			10/04/2019 14:37	Yijie Li	2124022, 2124025, 2124059
SM 4500 F-C-97	10/02/2019			10/03/2019 22:16	Dale L. Simmons	2124022
	10/02/2019			10/05/2019 05:40	Dale L. Simmons	2124025
	10/02/2019			10/05/2019 09:01	Dale L. Simmons	2124059
SM 5310 B-00	10/02/2019			10/03/2019 21:08	Madeline Funaro	2124060
	10/02/2019			10/04/2019 01:09	Madeline Funaro	2124023
	10/02/2019			10/04/2019 01:22	Madeline Funaro	2124027