Chemical Analysis Report

NE-DIST-2017-05-11-02

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

Event Description: **2213H LSJR**
Request ID: **RQ-2017-05-08-17**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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Jacksonville, FL 32256-7577
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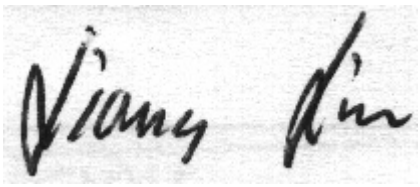
Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-JUN-2017 11:19



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 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: SJR out frm Blkcreek **Collection Date/Time: 05/10/2017 09:05**

Field ID: G2NE0183 05102017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1898518	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P325130	
	EPA 300.0 Rev. 2.1	Chloride	2.0E+03		mg Cl/L	P325828	
		Sulfate	310		mg SO4/L	P325832	
	SM 2120 B	Color (true)	61		PCU	P325133	
	SM 2320 B-97	Total Alkalinity	79		mg CaCO3/L	P325591	
	SM 2540 C-97	TDS	3.45E+03		mg/L	P325654	
	SM 2540 D-97	TSS	10	I	mg/L	P325533	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P325594	
1898521	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P325118	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P325395	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P325483	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P325249	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P325947	
1898524	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P325172	
1898542	EPA 200.7 Rev. 4.4	Calcium	83.4		mg/L	P325443	
		Iron	140		ug/L	P325443	
		Magnesium	134		mg/L	P325443	
		Potassium	38		mg/L	P325443	
		Sodium	1.03E+03		mg/L	P325443	
		Zinc	5.0	U	ug/L	P325443	
	EPA 200.8 Rev. 5.4	Arsenic	1.19		ug/L	P325892	
		Cadmium	0.020	U	ug/L	P325892	
		Chromium	0.40	U	ug/L	P325892	
		Copper	0.88		ug/L	P325892	
		Lead	0.23		ug/L	P325892	
		Nickel	0.30	I	ug/L	P325892	
		Silver	0.010	U	ug/L	P325892	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: SJR at marker 17 **Collection Date/Time: 05/10/2017 10:20**

Field ID: G2NE0173 05102017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1898519	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P325130	
	EPA 300.0 Rev. 2.1	Chloride	2.0E+03		mg Cl/L	P325828	
		Sulfate	320		mg SO4/L	P325832	
	SM 2120 B	Color (true)	61	A	PCU	P325133	
	SM 2320 B-97	Total Alkalinity	79		mg CaCO3/L	P325591	
	SM 2540 C-97	TDS	3.96E+03		mg/L	P325654	
	SM 2540 D-97	TSS	10	I	mg/L	P325533	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P325594	
1898522	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P325118	

Field ID: G2NE0173 05102017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1898522	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P325395	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P325483	
	EPA 365.1 Rev. 2.0	Total-P	0.061		mg P/L	P325250	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P325947	
1898525	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.034		mg P/L	P325172	
1898543	EPA 200.7 Rev. 4.4	Calcium	84.1		mg/L	P325443	
		Iron	110	I	ug/L	P325443	
		Magnesium	148		mg/L	P325443	
		Potassium	41		mg/L	P325443	
		Sodium	1.13E+03		mg/L	P325443	
		Zinc	5.0	U	ug/L	P325443	
	EPA 200.8 Rev. 5.4	Arsenic	1.16		ug/L	P325892	
		Cadmium	0.092		ug/L	P325892	
		Chromium	0.40	U	ug/L	P325892	
		Copper	0.79	I	ug/L	P325892	
		Lead	0.19	I	ug/L	P325892	
		Nickel	0.30	I	ug/L	P325892	
		Silver	0.010	U	ug/L	P325892	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: St.Johns River @ Alpine Grove dock **Collection Date/Time: 05/10/2017 10:40**

Field ID: G2NE1129 05102017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1898520	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P325130	
	EPA 300.0 Rev. 2.1	Chloride	2.8E+03		mg Cl/L	P325828	
		Sulfate	410		mg SO4/L	P325832	
	SM 2120 B	Color (true)	56		PCU	P325133	
	SM 2320 B-97	Total Alkalinity	77		mg CaCO3/L	P325591	
	SM 2540 C-97	TDS	4.95E+03	J	mg/L	P325654	
	SM 2540 D-97	TSS	10		mg/L	P325533	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P325594	
1898523	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P325118	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P325395	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P325483	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P325566	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P325947	
1898526	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P325172	
1898544	EPA 200.7 Rev. 4.4	Calcium	96.0		mg/L	P325443	
		Iron	78	I	ug/L	P325443	
		Magnesium	194		mg/L	P325443	
		Potassium	55		mg/L	P325443	
		Sodium	1.53E+03		mg/L	P325443	

Field ID: G2NE1129 05102017 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1898544	EPA 200.7 Rev. 4.4	Zinc	5.0	U	ug/L	P325443	
	EPA 200.8 Rev. 5.4	Arsenic	1.27		ug/L	P325892	
		Cadmium	0.020	U	ug/L	P325892	
		Chromium	0.40	U	ug/L	P325892	
		Copper	0.78	I	ug/L	P325892	
		Lead	0.14	I	ug/L	P325892	
		Nickel	0.29	I	ug/L	P325892	
		Silver	0.010	U	ug/L	P325892	

Ref. Method and Comment:
SM 2540 C-97: A constant dry weight was not attained.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P325130

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325443

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325892

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325828

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: P325832

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325118

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325395

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325249

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325250

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325566

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325172

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

Reference Method: SM 2120 B
Batch ID: P325133

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P325591

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

Reference Method: SM 2540 C-97
Batch ID: P325654

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P325533

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P325594

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P325947

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: P325443

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	109		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	98.9		P	85 - 115
Sodium	102		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325892

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.8		P	85 - 115
Cadmium	95.6		P	85 - 115
Chromium	95.2		P	85 - 115
Copper	95.8		P	85 - 115
Lead	99.1		P	85 - 115
Nickel	97.4		P	85 - 115
Silver	98.4		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325828

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325832

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: P325118

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325395

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325483

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: P325249

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325250

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: P325566

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325172

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P325591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P325594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P325947

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	90.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898374	Calcium	98.3		P	80 - 120
1898374	Iron	108	112	P/P	80 - 120
1898374	Magnesium	103		P	80 - 120
1898374	Potassium	99.6	99.9	P/P	80 - 120
1898374	Sodium	100		P	80 - 120
1898374	Zinc	98.2	100	P/P	80 - 120
1898541	Iron	108		P	80 - 120
1898541	Magnesium	103		P	80 - 120
1898541	Potassium	98.2		P	80 - 120
1898541	Sodium	101		P	80 - 120
1898541	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898077	Arsenic	103	102	P/P	80 - 120
1898077	Cadmium	100	100	P/P	80 - 120
1898077	Chromium	96.6	96.6	P/P	80 - 120
1898077	Copper	94.2	94.3	P/P	80 - 120
1898077	Lead	101	99.4	P/P	80 - 120
1898077	Nickel	96.6	96.2	P/P	80 - 120
1898077	Silver	99.4	98.6	P/P	80 - 120
1898664	Arsenic	107		P	80 - 120
1898664	Cadmium	101		P	80 - 120
1898664	Chromium	94.1		P	80 - 120
1898664	Copper	95.8		P	80 - 120
1898664	Lead	103		P	80 - 120
1898664	Nickel	97.1		P	80 - 120
1898664	Silver	99.9		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898480	Chloride	99.4		P	90 - 110
1898482	Chloride	98.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898480	Sulfate	97.1		P	90 - 110
1898482	Sulfate	96.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898430	Ammonia-N	108	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898610	Kjeldahl Nitrogen	96.0	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898521	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325249

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898350	Total-P	94.6	95.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898671	Total-P	92.7	93.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1899742	Total-P	96.8	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898439	O-Phosphate-P	101	102	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P325594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898378	Fluoride	98.7	95.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P325947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1900024	Organic Carbon	91.8	90.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P325130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898512	Turbidity	1.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898374	Calcium	0.133	Spike	P	0 - 20
1898374	Iron	3.60	Spike	P	0 - 20
1898374	Magnesium	1.49	Spike	P	0 - 20
1898374	Potassium	0.311	Spike	P	0 - 20
1898374	Sodium	0.311	Spike	P	0 - 20
1898374	Zinc	2.25	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325892

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898077	Arsenic	0.846	Spike	P	0 - 20
1898077	Cadmium	0.0788	Spike	P	0 - 20
1898077	Chromium	0.00758	Spike	P	0 - 20
1898077	Copper	0.115	Spike	P	0 - 20
1898077	Lead	1.11	Spike	P	0 - 20
1898077	Nickel	0.434	Spike	P	0 - 20
1898077	Silver	0.860	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898482	Chloride	0.0329	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898482	Sulfate	0.709	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898430	Ammonia-N	0.671	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898610	Kjeldahl Nitrogen	1.42	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898521	NO2NO3-N	0.451	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325249

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898350	Total-P	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898671	Total-P	1.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1899742	Total-P	0.285	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898439	O-Phosphate-P	1.87	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P325133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898519	Color (true)	1.49	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P325591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898378	Total Alkalinity	3.21	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P325654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898615	TDS	0.369	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P325594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898378	Fluoride	2.57	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P325947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1900024	Organic Carbon	1.02	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76358
Included Lab Sample IDs: 1898521, 1898522, 1898523

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76360
Included Lab Sample IDs: 1898518, 1898519, 1898520

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A76361
Included Lab Sample IDs: 1898518, 1898519, 1898520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76368
Included Lab Sample IDs: 1898524, 1898525, 1898526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.8	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A76456
Included Lab Sample IDs: 1898521, 1898522

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76509
Included Lab Sample IDs: 1898521, 1898522, 1898523

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A76549
Included Lab Sample IDs: 1898521, 1898522, 1898523

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	108	P/P	90 - 110
Kjeldahl Nitrogen	108	106	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A76561
Included Lab Sample IDs: 1898518, 1898519, 1898520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A76561
Included Lab Sample IDs: 1898518, 1898519, 1898520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76576
Included Lab Sample IDs: 1898542, 1898543, 1898544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76576
Included Lab Sample IDs: 1898542, 1898543, 1898544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	107	105	P/P	90 - 110
Magnesium	104	103	P/P	90 - 110
Potassium	99.5	99.5	P/P	90 - 110
Sodium	102	99.1	P/P	90 - 110
Zinc	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A76587
Included Lab Sample IDs: 1898523

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.5	98.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A76672
Included Lab Sample IDs: 1898518, 1898519, 1898520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Chloride	102	101	P/P	90 - 110
Sulfate	94.2	96.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A76726
Included Lab Sample IDs: 1898521, 1898522, 1898523

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.4	94.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76756
Included Lab Sample IDs: 1898542, 1898543, 1898544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	97.6	96.5	P/P	90 - 110
Chromium	98.6	97.5	P/P	90 - 110
Copper	102	98.4	P/P	90 - 110
Lead	102	99.9	P/P	90 - 110
Nickel	101	98.9	P/P	90 - 110
Silver	105	104	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
EPA 180.1 Rev. 2.0	Turbidity						1.33	
EPA 200.7 Rev. 4.4	Calcium	102	98.3					0.133
	Iron	109	108	112	108			3.60
	Magnesium	105	103	103				1.49
	Potassium	98.9	99.6	99.9	98.2			0.311
	Sodium	102	100	101				0.311
	Zinc	101	98.2	100	102			2.25
EPA 200.8 Rev. 5.4	Arsenic	99.8	103	102	107			0.846
	Cadmium	95.6	100	100	101			0.0788
	Chromium	95.2	96.6	96.6	94.1			0.0075
	Copper	95.8	94.2	94.3	95.8			0.115
	Lead	99.1	101	99.4	103			1.11
	Nickel	97.4	96.6	96.2	97.1			0.434
	Silver	98.4	99.4	98.6	99.9			0.860
EPA 300.0 Rev. 2.1	Chloride	101	98.8	99.4			0.0329	
	Sulfate	97.3	96.6	97.1			0.709	
EPA 350.1 Rev. 2.0	Ammonia-N	105	108	107				0.671
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.0	98.1				1.42
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	101				0.451
EPA 365.1 Rev. 2.0	Total-P	102	94.6	95.1				0.501
	Total-P	101	92.7	93.8				1.23
	Total-P	100	96.8	96.5				0.285
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.7	101	102				1.87
SM 2120 B	Color (true)						1.49	
SM 2320 B-97	Total Alkalinity	104					3.21	
SM 2540 C-97	TDS						0.369	
SM 4500 F-C-97	Fluoride	94.2	98.7	95.7				2.57
SM 5310 B-00	Organic Carbon	90.8	91.8	90.6				1.02

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1898518, 1898519, 1898520
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1898542, 1898543, 1898544
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1898542, 1898543, 1898544
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1898518, 1898519, 1898520
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1898518, 1898519, 1898520
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1898521, 1898522, 1898523
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1898521, 1898522, 1898523
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1898521, 1898522, 1898523
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1898521, 1898522, 1898523
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1898524, 1898525, 1898526
SM 2120 B / E31780	True Color measured at 450 nm	1898518, 1898519, 1898520
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1898518, 1898519, 1898520
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1898518, 1898519, 1898520

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1898518, 1898519, 1898520
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1898518, 1898519, 1898520
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1898521, 1898522, 1898523

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	05/11/2017			05/11/2017 15:50	Sima Feizi	1898518, 1898519, 1898520
EPA 200.7 Rev. 4.4	05/11/2017	05/17/2017	Elliott D. Healy	05/20/2017	Martin Acosta	1898542, 1898543, 1898544
EPA 200.8 Rev. 5.4	05/11/2017	05/26/2017	Elliott D. Healy	05/30/2017	Robert K Palmer	1898542, 1898543, 1898544
EPA 300.0 Rev. 2.1	05/11/2017			05/25/2017	Ping Hua	1898518, 1898519, 1898520
	05/11/2017			05/26/2017	Ping Hua	1898520
EPA 350.1 Rev. 2.0	05/11/2017			05/11/2017	Julie Michelle Frank	1898521, 1898522, 1898523
EPA 351.2 Rev. 2.0	05/11/2017	05/17/2017	Adrian Shelby	05/19/2017	Joseph Suarez	1898521, 1898522, 1898523
EPA 353.2 Rev. 2.0	05/11/2017			05/18/2017	Beverly Y. Sanders	1898521, 1898522, 1898523
EPA 365.1 Rev. 2.0	05/11/2017	05/15/2017	Vijayalakshmi Reddy	05/16/2017	Lipi Saha	1898521, 1898522
	05/11/2017	05/19/2017	Vijayalakshmi Reddy	05/22/2017	Lipi Saha	1898523
EPA 365.1 Rev. 2.0 dissolved	05/11/2017			05/11/2017 15:49	Anthony C. Onicha	1898524, 1898525
	05/11/2017			05/11/2017 15:50	Anthony C. Onicha	1898526
SM 2120 B	05/11/2017			05/11/2017 16:40	Julia Storbeck	1898518
	05/11/2017			05/11/2017 16:42	Julia Storbeck	1898520
	05/11/2017			05/11/2017 16:46	Julia Storbeck	1898519
SM 2320 B-97	05/11/2017			05/20/2017	Dale L. Simmons	1898518, 1898519, 1898520
SM 2540 C-97	05/11/2017			05/15/2017	Sima Feizi	1898518, 1898519, 1898520
SM 2540 D-97	05/11/2017			05/15/2017	Sima Feizi	1898518, 1898519, 1898520
SM 4500 F-C-97	05/11/2017			05/20/2017	Dale L. Simmons	1898518, 1898519, 1898520
SM 5310 B-00	05/11/2017			05/25/2017	Christopher Armour	1898521, 1898522, 1898523