Chemical Analysis Report

CEN-DIST-2017-03-24-02

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

Event Description: **Groover/Spruce 2674**
Request ID: **RQ-2017-03-20-55**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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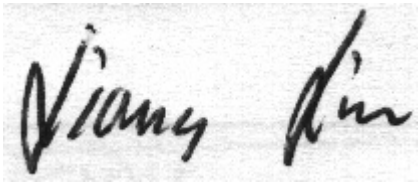
Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-APR-2017 15:23



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, Nutrients and Pesticides.

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: Groover Branch @ Tymber Road Bridge **Collection Date/Time: 03/23/2017 11:40**

Field ID: G5CE0041 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882978	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P322151	
	EPA 300.0 Rev. 2.1	Chloride	74		mg Cl/L	P322560	
		Sulfate	18		mg SO4/L	P322562	
	SM 2120 B	Color (true)	78		PCU	P322162	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P322802	
	SM 2540 C-97	TDS	300	A	mg/L	P322727	
	SM 2540 D-97	TSS	5	I	mg/L	P322711	
	SM 4500 F-C-97	Fluoride	0.083	I	mg F/L	P323008	
1882979	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P322248	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.70		mg N/L	P322270	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P322470	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P322229	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P322210	
1882980	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P322169	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Spruce Creek @ Spruce Creek Blvd **Collection Date/Time: 03/23/2017 12:25**

Field ID: G5CE0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882975	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P322151	
	EPA 300.0 Rev. 2.1	Chloride	64		mg Cl/L	P322560	
		Sulfate	6.4		mg SO4/L	P322562	
	SM 2120 B	Color (true)	41		PCU	P322162	
	SM 2320 B-97	Total Alkalinity	266		mg CaCO3/L	P322802	
	SM 2540 C-97	TDS	375		mg/L	P322726	
	SM 2540 D-97	TSS	3	I	mg/L	P322710	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P323008	
1882976	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P322248	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P322270	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.050		mg N/L	P322470	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P322229	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P322210	
1882977	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P322172	
1883006	EPA 200.7 Rev. 4.4	Calcium	101		mg/L	P322260	
		Iron	460		ug/L	P322260	
		Magnesium	6.62		mg/L	P322260	
		Potassium	1.6		mg/L	P322260	
		Sodium	35.4		mg/L	P322260	
		Zinc	5.0	U	ug/L	P322260	
	EPA 200.8 Rev. 5.4	Arsenic	0.33		ug/L	P322260	
		Cadmium	0.020	U	ug/L	P322260	

Field ID: G5CE0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1883006	EPA 200.8 Rev. 5.4	Chromium	0.40	U	ug/L	P322260	
		Copper	0.20	U	ug/L	P322260	
		Lead	0.050	U	ug/L	P322260	
		Nickel	0.20	U	ug/L	P322260	
		Silver	0.010	U	ug/L	P322260	
1883007	EPA 8321B	Sucralose**	0.38		ug/L	P322051	
	USGS O-2060-01	2,4-D	0.0070	I	ug/L	P322050	
		Diuron	0.0080	U	ug/L	P322050	
		Fenuron	0.016	U	ug/L	P322050	
		Imidacloprid	0.0080	U	ug/L	P322050	
		Bentazon	0.34		ug/L	P322050	
		Linuron	0.0080	U	ug/L	P322050	
		Acetaminophen**	0.010	U	ug/L	P322050	
		MCPP	0.0040	U	ug/L	P322050	
		Carbamazepine**	4.0E-04	U	ug/L	P322050	
		Triclopyr**	0.010	U	ug/L	P322050	
		Primidone**	0.0080	U	ug/L	P322050	
		Fluridone**	0.017		ug/L	P322050	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
USGS O-2060-01: MDL's for some parameters elevated due to matrix interference.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P322151

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322260

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: P322260

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322260

Component	Result	Code	Units
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322560

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322562

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322248

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322270

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322470

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322229

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322169

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P322051

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P322162

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P322802

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

Reference Method: SM 2540 C-97
Batch ID: P322726

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P322727

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P322710

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P322711

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P323008

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P322210

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

Quality Assurance Report
Method Blank Results

Reference Method: USGS O-2060-01
Batch ID: P322050

Component	Result	Code	Units
2,4-D	0.0040	U	ug/L
Acetaminophen	0.010	U	ug/L
Bentazon	0.0040	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	0.0040	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	0.0040	U	ug/L
Linuron	0.0040	U	ug/L
MCPP	0.0040	U	ug/L
Primidone	0.0080	U	ug/L
Triclopyr	0.010	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322260

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	101		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322260

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.5		P	85 - 115
Cadmium	96.6		P	85 - 115
Chromium	102		P	85 - 115
Copper	96.0		P	85 - 115
Lead	98.4		P	85 - 115
Nickel	96.0		P	85 - 115
Silver	98.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322560

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322562

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322248

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: P322270

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322470

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322229

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P322051

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	104		P	40 - 140

Reference Method: SM 2320 B-97
Batch ID: P322802

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

Reference Method: SM 4500 F-C-97
Batch ID: P323008

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.4		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P322210

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P322050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	82.8		P	40 - 140
Acetaminophen	62.0		P	40 - 140
Bentazon	108		P	40 - 140
Carbamazepine	99.2		P	40 - 140
Diuron	70.8		P	40 - 140
Fenuron	90.4		P	40 - 140
Fluridone	81.2		P	40 - 140
Imidacloprid	77.2		P	40 - 160
Linuron	81.2		P	40 - 140
MCPP	81.2		P	40 - 140
Primidone	103		P	40 - 140
Triclopyr	108		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882636	Calcium	103		P	80 - 120
1882636	Iron	105		P	80 - 120
1882636	Magnesium	105		P	80 - 120
1882636	Potassium	95.6		P	80 - 120
1882636	Sodium	101		P	80 - 120
1882636	Zinc	97.2		P	80 - 120
1882931	Calcium	99.0		P	80 - 120
1882931	Iron	106	107	P/P	80 - 120
1882931	Magnesium	101		P	80 - 120
1882931	Potassium	98.6	101	P/P	80 - 120
1882931	Sodium	98.2		P	80 - 120
1882931	Zinc	96.8	98.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882636	Arsenic	98.3		P	80 - 120
1882636	Cadmium	100		P	80 - 120
1882636	Chromium	98.8		P	80 - 120
1882636	Copper	96.1		P	80 - 120
1882636	Lead	98.7		P	80 - 120
1882636	Nickel	91.6		P	80 - 120
1882636	Silver	99.4		P	80 - 120
1882931	Arsenic	98.6	99.1	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882931	Cadmium	98.9	99.6	P/P	80 - 120
1882931	Chromium	101	102	P/P	80 - 120
1882931	Copper	96.1	94.3	P/P	80 - 120
1882931	Lead	100	100	P/P	80 - 120
1882931	Nickel	95.2	94.1	P/P	80 - 120
1882931	Silver	99.8	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882909	Chloride	99.0		P	90 - 110
1882957	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322562

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882909	Sulfate	100		P	90 - 110
1882957	Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882962	Ammonia-N	102	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882979	NO2NO3-N	100	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322229

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882962	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883041	O-Phosphate-P	97.2	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882893	O-Phosphate-P	95.6	97.3	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P322051

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882586	Sucralose	109	112	P/P	40 - 140

Reference Method: SM 4500 F-C-97
Batch ID: P323008

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883034	Fluoride	98.8	99.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P322210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882602	Organic Carbon	98.0	99.4	P/P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P322050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882581	2,4-D	102	94.0	P/P	40 - 140
1882581	Acetaminophen	68.0	86.0	P/P	40 - 140
1882581	Bentazon	111	100	P/P	40 - 140
1882581	Carbamazepine	99.1	91.5	P/P	40 - 140
1882581	Diuron	84.0	75.2	P/P	40 - 140
1882581	Fenuron	89.2	81.6	P/P	40 - 140
1882581	Fluridone	83.6	76.0	P/P	40 - 140
1882581	Imidacloprid	111	89.9	P/P	40 - 160
1882581	Linuron	72.4	68.0	P/P	40 - 140
1882581	MCPP	92.4	85.2	P/P	40 - 140
1882581	Primidone	112	97.2	P/P	40 - 140
1882581	Triclopyr	122	102	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P322151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882958	Turbidity	4.86	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882931	Calcium	3.32	Spike	P	0 - 20
1882931	Iron	0.787	Spike	P	0 - 20
1882931	Magnesium	1.63	Spike	P	0 - 20
1882931	Potassium	1.83	Spike	P	0 - 20
1882931	Sodium	2.61	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882931	Zinc	2.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882931	Arsenic	0.538	Spike	P	0 - 20
1882931	Cadmium	0.694	Spike	P	0 - 20
1882931	Chromium	1.07	Spike	P	0 - 20
1882931	Copper	1.84	Spike	P	0 - 20
1882931	Lead	0.296	Spike	P	0 - 20
1882931	Nickel	1.16	Spike	P	0 - 20
1882931	Silver	0.783	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882909	Chloride	0.185	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882909	Sulfate	0.322	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882962	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883036	Kjeldahl Nitrogen	5.68	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882979	NO2NO3-N	1.13	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322229

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882962	Total-P	0.847	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883041	O-Phosphate-P	0.516	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882893	O-Phosphate-P	1.26	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P322051

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882586	Sucralose	2.25	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P322162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882958	Color (true)	2.23	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P322802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883034	Total Alkalinity	3.74	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P322726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882688	TDS	6.47	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P322727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882978	TDS	5.01	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P323008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883034	Fluoride	0.506	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P322210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882602	Organic Carbon	0.910	Spike	P	0 - 20

Reference Method: USGS O-2060-01
Batch ID: P322050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882581	2,4-D	8.55	Spike	P	0 - 30
1882581	Acetaminophen	23.4	Spike	P	0 - 30
1882581	Bentazon	6.95	Spike	P	0 - 30
1882581	Carbamazepine	7.87	Spike	P	0 - 30
1882581	Diuron	11.1	Spike	P	0 - 30
1882581	Fenuron	8.90	Spike	P	0 - 30
1882581	Fluridone	9.52	Spike	P	0 - 30
1882581	Imidacloprid	17.1	Spike	P	0 - 30
1882581	Linuron	6.27	Spike	P	0 - 30
1882581	MCPP	8.11	Spike	P	0 - 30
1882581	Primidone	13.8	Spike	P	0 - 30
1882581	Triclopyr	18.2	Spike	P	0 - 30

* 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
Surrogates

Lab Sample ID: 1883007
Field Sample ID: G5CE0083

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	117	P	40 - 150
USGS O-2060-01	2,4-D-d3	110	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	83.6	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	54.2	P	40 - 160
USGS O-2060-01	Diuron-d6	76.4	P	40 - 150
USGS O-2060-01	Primidone-d5	46.0	P	40 - 150

Quality Assurance Report
Calibration Verification

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75338
Included Lab Sample IDs: 1882975, 1882978

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

Reference Method: SM 2120 B
Run ID: A75344
Included Lab Sample IDs: 1882975, 1882978

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	98.6	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75348
Included Lab Sample IDs: 1882977, 1882980

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.4	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A75367
Included Lab Sample IDs: 1882976, 1882979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.8	101	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A75373
Included Lab Sample IDs: 1883007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	104	92.9	P/P	60 - 150

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75380
Included Lab Sample IDs: 1882976, 1882979

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A75389
Included Lab Sample IDs: 1882976, 1882979

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75427
Included Lab Sample IDs: 1882976, 1882979

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A75446
Included Lab Sample IDs: 1883006

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	93.1	91.6	P/P	90 - 110
Cadmium	92.4	92.5	P/P	90 - 110
Chromium	97.3	97.2	P/P	90 - 110
Copper	94.5	93.6	P/P	90 - 110
Lead	93.4	92.8	P/P	90 - 110
Silver	94.6	94.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A75463
Included Lab Sample IDs: 1882976, 1882979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A75478
Included Lab Sample IDs: 1883006

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	97.3	93.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A75488
Included Lab Sample IDs: 1882975, 1882978

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	100	96.4	P/P	90 - 110

Reference Method: USGS O-2060-01
Run ID: A75529
Included Lab Sample IDs: 1883007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	115	118	P/P	50 - 150
Bentazon	83.4	90.8	P/P	50 - 150
MCPP	106	111	P/P	50 - 150
Triclopyr	106	106	P/P	50 - 150

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A75546
Included Lab Sample IDs: 1883006

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.8	99.9	P/P	90 - 110
Iron	102	105	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	98.9	98.5	P/P	90 - 110
Sodium	97.6	100	P/P	90 - 110
Zinc	98.1	99.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: USGS O-2060-01
Run ID: A75564
Included Lab Sample IDs: 1883007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	122	109	P/P	60 - 150
Carbamazepine	132	138	P/P	60 - 150
Primidone	123	138	P/P	60 - 150

Reference Method: USGS O-2060-01
Run ID: A75566
Included Lab Sample IDs: 1883007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Diuron	86.4	88.0	P/P	60 - 150
Fenuron	90.0	94.4	P/P	60 - 150
Fluridone	94.8	96.0	P/P	60 - 150
Imidacloprid	84.4	84.8	P/P	60 - 150
Linuron	120	136	P/P	60 - 150

Reference Method: SM 2320 B-97
Run ID: A75578
Included Lab Sample IDs: 1882975, 1882978

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

Reference Method: SM 4500 F-C-97
Run ID: A75665
Included Lab Sample IDs: 1882975, 1882978

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

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.86	
EPA 200.7 Rev. 4.4	Calcium	102	103	99.0				3.32
	Iron	105	105	106	107			0.787
	Magnesium	103	101	105				1.63
	Potassium	99.4	95.6	98.6	101			1.83
	Sodium	101	101	98.2				2.61
	Zinc	99.3	97.2	96.8	98.9			2.16
EPA 200.8 Rev. 5.4	Arsenic	96.5	98.3	98.6	99.1			0.538
	Cadmium	96.6	100	98.9	99.6			0.694
	Chromium	102	98.8	101	102			1.07
	Copper	96.0	96.1	96.1	94.3			1.84
	Lead	98.4	98.7	100	100			0.296

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.8 Rev. 5.4	Nickel	96.0	91.6	95.2	94.1			1.16
	Silver	98.8	99.4	99.8	101			0.783
EPA 300.0 Rev. 2.1	Chloride	104	99.0	100			0.185	
	Sulfate	102	100	98.8			0.322	
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	100				1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103						5.68
EPA 353.2 Rev. 2.0	NO2NO3-N	101	100	98.5				1.13
EPA 365.1 Rev. 2.0	Total-P	104	104	105				0.847
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	97.2	96.7				0.516
	O-Phosphate-P	97.9	95.6	97.3				1.26
EPA 8321B	Sucralose	104	109	112				2.25
SM 2120 B	Color (true)						2.23	
SM 2320 B-97	Total Alkalinity	104					3.74	
SM 2540 C-97	TDS						6.47	
	TDS						5.01	
SM 4500 F-C-97	Fluoride	97.4	98.8	99.6				0.506
SM 5310 B-00	Organic Carbon	99.8	98.0	99.4				0.910
USGS O-2060-01	2,4-D	82.8	102	94.0				8.55
	Acetaminophen	62.0	68.0	86.0				23.4
	Bentazon	108	111	100				6.95
	Carbamazepine	99.2	99.1	91.5				7.87
	Diuron	70.8	84.0	75.2				11.1
	Fenuron	90.4	89.2	81.6				8.90
	Fluridone	81.2	83.6	76.0				9.52
	Imidacloprid	77.2	111	89.9				17.1
	Linuron	81.2	72.4	68.0				6.27
	MCPP	81.2	92.4	85.2				8.11
	Primidone	103	112	97.2				13.8
	Triclopyr	108	122	102				18.2

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1882975, 1882978
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1883006
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1883006
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1882975, 1882978
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1882975, 1882978
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1882976, 1882979
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1882976, 1882979
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1882976, 1882979
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1882976, 1882979
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1882977, 1882980
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1883007
SM 2120 B / E31780	True Color measured at 450 nm	1882975, 1882978

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1882975, 1882978
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1882975, 1882978
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1882975, 1882978
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1882975, 1882978
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1882976, 1882979
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1883007
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1883007

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	03/24/2017			03/24/2017 15:35	Sima Feizi	1882975, 1882978
EPA 200.7 Rev. 4.4	03/24/2017	03/27/2017	Elliott D. Healy	04/03/2017	Joshua Ayres	1883006
EPA 200.8 Rev. 5.4	03/24/2017	03/27/2017	Elliott D. Healy	03/30/2017	Robert K Palmer	1883006
	03/24/2017	03/27/2017	Elliott D. Healy	03/31/2017	Betina Topolski	1883006
EPA 300.0 Rev. 2.1	03/24/2017			03/31/2017	Ping Hua	1882975, 1882978
EPA 350.1 Rev. 2.0	03/24/2017			03/27/2017	Julie Michelle Frank	1882976, 1882979
EPA 351.2 Rev. 2.0	03/24/2017	03/28/2017	Adrian Shelby	03/29/2017	Joseph Suarez	1882976, 1882979
EPA 353.2 Rev. 2.0	03/24/2017			03/30/2017	Beverly Y. Sanders	1882976, 1882979
EPA 365.1 Rev. 2.0	03/24/2017	03/27/2017	Vijayalakshmi Reddy	03/28/2017	Christopher Armour	1882976, 1882979
EPA 365.1 Rev. 2.0 dissolved	03/24/2017			03/24/2017 16:51	Anthony C. Onicha	1882977
	03/24/2017			03/24/2017 16:52	Anthony C. Onicha	1882980
EPA 8321B	03/24/2017	03/24/2017	Mohammad Ghaffari	03/24/2017	Mohammad Ghaffari	1883007
SM 2120 B	03/24/2017			03/24/2017 16:17	Julia Storbeck	1882975
	03/24/2017			03/24/2017 16:18	Julia Storbeck	1882978
SM 2320 B-97	03/24/2017			04/05/2017	Dale L. Simmons	1882975, 1882978
SM 2540 C-97	03/24/2017			03/28/2017	Yijie Li	1882975, 1882978
SM 2540 D-97	03/24/2017			03/28/2017	Yijie Li	1882975, 1882978
SM 4500 F-C-97	03/24/2017			04/07/2017	Dale L. Simmons	1882975, 1882978
SM 5310 B-00	03/24/2017			03/25/2017	Julie Michelle Frank	1882976, 1882979
USGS O-2060-01	03/24/2017	03/27/2017	Hoor Shaik	03/28/2017	Juyoung Kim	1883007
	03/24/2017	03/27/2017	Hoor Shaik	04/01/2017	Juyoung Kim	1883007
	03/24/2017	03/27/2017	Hoor Shaik	04/04/2017	Juyoung Kim	1883007