

Chemical Analysis Report

NE-DIST-2017-11-02-01

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

Event Description: **Suwannee springs**
Request ID: **RQ-2017-10-30-12**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 30-NOV-2017 16:27

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, textured background.

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: 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: TURTLE SPRING HEAD

Collection Date/Time: 11/01/2017 10:15

Field ID: G1NE0821 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942083	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P334716	
		Sulfate	6.7		mg SO4/L	P334718	
	SM 2120 B	Color (true)	4.8	I	PCU	P334650	
	SM 2320 B-97	Total Alkalinity	204		mg CaCO3/L	P335155	
	SM 2540 C-97	TDS	212		mg/L	P335220	
	SM 2540 D-97	TSS	2	U	mg/L	P335131	
1942087	SM 4500 F-C-97	Fluoride	0.054	I	mg F/L	P335158	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P335283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35	I	mg N/L	P335636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.95		mg N/L	P334942	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P334759	
1942091	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P335077	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P334598	

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: The PQL was elevated due to sample matrix interference.

Sample Location: ROCK BLUFF SPRING HEAD

Collection Date/Time: 11/01/2017 10:55

Field ID: G1NE0813 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942084	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	6.6		mg Cl/L	P334716	
		Sulfate	19		mg SO4/L	P334718	
	SM 2120 B	Color (true)	9.1		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	155	A	mg CaCO3/L	P335155	
	SM 2540 C-97	TDS	201		mg/L	P335220	
	SM 2540 D-97	TSS	3	I	mg/L	P335131	
1942088	SM 4500 F-C-97	Fluoride	0.062	I	mg F/L	P335158	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P335283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23		mg N/L	P334936	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.8		mg N/L	P334943	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P334759	
1942092	SM 5310 B-00	Organic Carbon	1.6		mg C/L	P335077	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.059		mg P/L	P334598	

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: COW CREEK @ SR 340

Collection Date/Time: 11/01/2017 11:30

Field ID: G1NE0622 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942103	EPA 8321B	Sucralose**	0.010	U	ug/L	P334540	
	USGS O-2060-01	2,4-D	0.0020	UQ	ug/L	P335857	

Field ID: G1NE0622 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942103	USGS O-2060-01	Diuron	8.0E-04	U	ug/L	P334541	MS
		Fenuron	0.0080	U	ug/L	P334541	
		Imidacloprid	8.0E-04	U	ug/L	P334541	
		Bentazon	8.0E-04	UQ	ug/L	P335857	
		Linuron	0.0040	U	ug/L	P334541	
		Acetaminophen**	0.0080	U	ug/L	P334541	
		MCP	0.0020	UQ	ug/L	P335857	
		Carbamazepine**	4.0E-04	U	ug/L	P334541	
		Triclopyr**	0.0040	UQ	ug/L	P335857	
		Primidone**	0.0040	U	ug/L	P334541	
		Fluridone**	4.0E-04	U	ug/L	P334541	

Ref. Method and Comment:

USGS O-2060-01: Sample required re-extraction beyond normal holding time due to reagent performance inconsistencies.

Sample Location: COW CREEK @ SR 138

Collection Date/Time: 11/01/2017 11:45

Field ID: G1NE0565 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942104	EPA 8321B	Sucralose**	0.010	U	ug/L	P334540	MS
	USGS O-2060-01	2,4-D	0.0020	UQ	ug/L	P335857	
		Diuron	8.0E-04	U	ug/L	P334541	
		Fenuron	0.0080	U	ug/L	P334541	
		Imidacloprid	8.0E-04	U	ug/L	P334541	
		Bentazon	8.0E-04	UQ	ug/L	P335857	
		Linuron	0.0040	U	ug/L	P334541	
		Acetaminophen**	0.0080	U	ug/L	P334541	
		MCP	0.0020	UQ	ug/L	P335857	
		Carbamazepine**	4.0E-04	U	ug/L	P334541	
		Triclopyr**	0.0040	UQ	ug/L	P335857	
		Primidone**	0.0040	U	ug/L	P334541	
		Fluridone**	4.0E-04	U	ug/L	P334541	

Ref. Method and Comment:

USGS O-2060-01: Sample required re-extraction beyond normal holding time due to reagent performance inconsistencies.

Sample Location: TRAIL SPRING (SPRING VENT)

Collection Date/Time: 11/01/2017 12:05

Field ID: G1NE0815 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942085	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P334716	
		Sulfate	32		mg SO4/L	P334718	
		Color (true)	16		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	166		mg CaCO3/L	P335155	
	SM 2540 C-97	TDS	298		mg/L	P335221	
	SM 2540 D-97	TSS	2	I	mg/L	P335132	
	SM 4500 F-C-97	Fluoride	0.069	I	mg F/L	P335158	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P335283	

Field ID: G1NE0815 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942089	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26	J	mg N/L	P334936	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	13		mg N/L	P334943	
	EPA 365.1 Rev. 2.0	Total-P	0.063		mg P/L	P334764	
	SM 5310 B-00	Organic Carbon	2.3		mg C/L	P335077	
1942093	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.061		mg P/L	P334598	

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: Refer to the narrative for an explanation of QC Codes.

Sample Location: HART SPRINGS

Collection Date/Time: 11/01/2017 12:40

Field ID: G1NE0013 11012017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1942086	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P334586	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P334716	
		Sulfate	36		mg SO4/L	P334718	
	SM 2120 B	Color (true)	9.3		PCU	P334650	
	SM 2320 B-97	Total Alkalinity	206		mg CaCO3/L	P335155	
	SM 2540 C-97	TDS	287	A	mg/L	P335221	
	SM 2540 D-97	TSS	2	IA	mg/L	P335132	
1942090	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P335158	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P335283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21		mg N/L	P334936	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.2		mg N/L	P334943	
	EPA 365.1 Rev. 2.0	Total-P	0.074		mg P/L	P334764	
1942094	SM 5310 B-00	Organic Carbon	1.4		mg C/L	P335077	MS
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.071		mg P/L	P334598	

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: P334586

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P334716

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P334718

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335283

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334943

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334764

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

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

Reference Method: EPA 8321B
Batch ID: P334540

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P334650

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P335155

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

Reference Method: SM 2540 C-97
Batch ID: P335220

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P335221

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P335131

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P335132

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P335158

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P335077

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

Reference Method: USGS O-2060-01
Batch ID: P334541

Component	Result	Code	Units
Acetaminophen	0.0080	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	8.0E-04	U	ug/L
Fenuron	0.0080	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: USGS O-2060-01
Batch ID: P334541

Component	Result	Code	Units
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
Primidone	0.0040	U	ug/L

Reference Method: USGS O-2060-01
Batch ID: P335857

Component	Result	Code	Units
2,4-D	0.0020	U	ug/L
Bentazon	8.0E-04	U	ug/L
MCP	0.0020	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334716

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335283

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: P334936

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335636

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: P334942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334943

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

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: P334764

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.4		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P334540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	83.2		P	40 - 150

Reference Method: SM 2320 B-97
Batch ID: P335155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P335158

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P335077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: USGS O-2060-01
Batch ID: P334541

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Acetaminophen	103		P	30 - 150
Carbamazepine	110		P	40 - 150
Diuron	95.7		P	40 - 150
Fenuron	115		P	40 - 150
Fluridone	112		P	40 - 150
Imidacloprid	112		P	40 - 160
Linuron	105		P	40 - 150
Primidone	102		P	40 - 150

Reference Method: USGS O-2060-01
Batch ID: P335857

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	94.9		P	40 - 150
Bentazon	97.8		P	30 - 150
MCPP	92.8		P	40 - 150
Triclopyr	94.0		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334716

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941950	Chloride	94.5		P	90 - 110
1942068	Chloride	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941950	Sulfate	94.7		P	90 - 110
1942068	Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942087	Ammonia-N	97.2	94.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942089	Kjeldahl Nitrogen	93.6	88.4	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1944275	Kjeldahl Nitrogen	95.8	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941957	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942124	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942087	Total-P	98.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942112	Total-P	95.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941942	O-Phosphate-P	93.1	95.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P334540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942103	Sucralose	69.4	64.9	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P335158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942084	Fluoride	97.1	98.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P335077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941958	Organic Carbon	93.6	95.5	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: USGS O-2060-01
 Batch ID: P334541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941999	Acetaminophen	98.8	118	P/P	30 - 150
1941999	Carbamazepine	103	107	P/P	40 - 150
1941999	Diuron	75.6	80.9	P/P	40 - 150
1941999	Fenuron	112	108	P/P	40 - 150
1941999	Fluridone	87.6	85.3	P/P	40 - 150
1941999	Imidacloprid	186	198	F/F	40 - 160
1941999	Linuron	86.2	86.8	P/P	40 - 150
1941999	Primidone	125	119	P/P	40 - 150

Reference Method: USGS O-2060-01
 Batch ID: P335857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1942197	2,4-D	83.8	88.3	P/P	40 - 150
1942197	Bentazon	62.6	66.1	P/P	30 - 150
1942197	MCP	68.5	70.1	P/P	40 - 150
1942197	Triclopyr	65.6	71.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P334586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942073	Turbidity	3.13	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P334716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941950	Chloride	0.457	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P334718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941950	Sulfate	0.958	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P335283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942087	Ammonia-N	2.66	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942089	Kjeldahl Nitrogen	4.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1944275	Kjeldahl Nitrogen	2.72	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941957	NO2NO3-N	0.344	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942124	NO2NO3-N	0.396	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942087	Total-P	0.900	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942112	Total-P	4.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941942	O-Phosphate-P	1.81	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P334540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942103	Sucralose	6.77	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P334650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941953	Color (true)	12.9	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P335155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942084	Total Alkalinity	0.604	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P335220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942067	TDS	6.94	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P335221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942086	TDS	0.697	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P335158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942084	Fluoride	1.01	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P335077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941958	Organic Carbon	1.53	Spike	P	0 - 20

Reference Method: USGS O-2060-01
Batch ID: P334541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941999	Acetaminophen	5.95	Spike	P	0 - 30
1941999	Carbamazepine	4.37	Spike	P	0 - 30
1941999	Diuron	3.58	Spike	P	0 - 30
1941999	Fenuron	3.75	Spike	P	0 - 30
1941999	Fluridone	2.39	Spike	P	0 - 30
1941999	Imidacloprid	5.35	Spike	P	0 - 30
1941999	Linuron	0.670	Spike	P	0 - 30
1941999	Primidone	4.43	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: USGS O-2060-01
Batch ID: P335857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1942197	2,4-D	5.29	Spike	P	0 - 30
1942197	Bentazon	4.96	Spike	P	0 - 30
1942197	MCP	2.41	Spike	P	0 - 30
1942197	Triclopyr	8.26	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: 1942103
Field Sample ID: G1NE0622 11012017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	89.1	P	30 - 160
EPA 8321B	Carbamazepine-d10	87.2	P	30 - 160
EPA 8321B	Diuron-d6	66.4	P	30 - 160
EPA 8321B	Primidone-d5	92.9	P	30 - 160
EPA 8321B	Sucralose-d6	66.0	P	40 - 160
USGS O-2060-01	2,4-D-d3	65.6	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	89.1	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	87.2	P	30 - 160
USGS O-2060-01	Diuron-d6	66.4	P	30 - 160
USGS O-2060-01	Primidone-d5	92.9	P	30 - 160
USGS O-2060-01	Sucralose-d6	66.0	P	40 - 160

Lab Sample ID: 1942104
Field Sample ID: G1NE0565 11012017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	75.7	P	30 - 160
EPA 8321B	Carbamazepine-d10	80.8	P	30 - 160
EPA 8321B	Diuron-d6	62.5	P	30 - 160
EPA 8321B	Primidone-d5	96.2	P	30 - 160
EPA 8321B	Sucralose-d6	68.3	P	40 - 160
USGS O-2060-01	2,4-D-d3	64.4	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	75.7	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	80.8	P	30 - 160
USGS O-2060-01	Diuron-d6	62.5	P	30 - 160
USGS O-2060-01	Primidone-d5	96.2	P	30 - 160
USGS O-2060-01	Sucralose-d6	68.3	P	40 - 160

Quality Assurance Report Calibration Verification

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A80005

Included Lab Sample IDs: 1942083, 1942084, 1942085, 1942086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A80009

Included Lab Sample IDs: 1942091, 1942092, 1942093, 1942094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	95.7	96.8	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A80019

Included Lab Sample IDs: 1942103, 1942104

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	100	106	P/P	60 - 150

Reference Method: SM 2120 B

Run ID: A80027

Included Lab Sample IDs: 1942083, 1942084, 1942085, 1942086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A80039

Included Lab Sample IDs: 1942083, 1942084, 1942085, 1942086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.8	P/P	90 - 110
Sulfate	99.3	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80090

Included Lab Sample IDs: 1942088, 1942089, 1942090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110
Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80097

Included Lab Sample IDs: 1942087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80129

Included Lab Sample IDs: 1942087, 1942088, 1942089, 1942090

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80129

Included Lab Sample IDs: 1942087, 1942088, 1942089, 1942090

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

Reference Method: SM 5310 B-00

Run ID: A80188

Included Lab Sample IDs: 1942087, 1942088, 1942089, 1942090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.9	P/P	90 - 110
Organic Carbon	97.5	96.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A80221

Included Lab Sample IDs: 1942083, 1942084, 1942085, 1942086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A80221

Included Lab Sample IDs: 1942083, 1942084, 1942085, 1942086

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

Reference Method: USGS O-2060-01

Run ID: A80228

Included Lab Sample IDs: 1942103, 1942104

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	93.4	97.0	P/P	60 - 150
Acetaminophen	97.0	93.7	P/P	60 - 150
Carbamazepine	105	108	P/P	60 - 150
Carbamazepine	106	105	P/P	60 - 150
Diuron	107	110	P/P	60 - 150
Diuron	110	111	P/P	60 - 150
Fenuron	106	108	P/P	60 - 150
Fenuron	108	106	P/P	60 - 150
Fluridone	106	105	P/P	60 - 160
Fluridone	107	106	P/P	60 - 160
Imidacloprid	97.3	98.1	P/P	60 - 150
Imidacloprid	98.1	88.1	P/P	60 - 150
Linuron	105	108	P/P	60 - 150
Linuron	108	105	P/P	60 - 150
Primidone	103	95.1	P/P	60 - 150
Primidone	112	103	P/P	60 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80261

Included Lab Sample IDs: 1942088, 1942089, 1942090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	96.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80262

Included Lab Sample IDs: 1942087, 1942088, 1942089, 1942090

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80407

Included Lab Sample IDs: 1942087

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

Reference Method: USGS O-2060-01

Run ID: A80527

Included Lab Sample IDs: 1942103, 1942104

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	93.8	97.0	P/P	50 - 150
Bentazon	119	112	P/P	50 - 150
MCPP	98.5	96.6	P/P	50 - 150
Triclopyr	96.0	92.8	P/P	50 - 150

* 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					3.13	
EPA 300.0 Rev. 2.1	Chloride	95.1	94.5	94.6		0.457	
	Sulfate	95.7	94.7	95.7		0.958	
EPA 350.1 Rev. 2.0	Ammonia-N	100	97.2	94.3			2.66
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	93.6	88.4			4.60
	Kjeldahl Nitrogen	103	95.8	98.8			2.72
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102			0.344
	NO2NO3-N	104	104	103			0.396
EPA 365.1 Rev. 2.0	Total-P	101	98.0	97.0			0.900
	Total-P	101	95.9	100			4.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.4	93.1	95.2			1.81
EPA 8321B	Sucralose	83.2	69.4	64.9			6.77
SM 2120 B	Color (true)					12.9	
SM 2320 B-97	Total Alkalinity	103				0.604	
SM 2540 C-97	TDS					6.94	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
SM 2540 C-97	TDS				0.697	
SM 4500 F-C-97	Fluoride	99.2	97.1	98.3		1.01
SM 5310 B-00	Organic Carbon	96.4	93.6	95.5		1.53
USGS O-2060-01	2,4-D	94.9	83.8	88.3		5.29
	Acetaminophen	103	98.8	118		5.95
	Bentazon	97.8	62.6	66.1		4.96
	Carbamazepine	110	103	107		4.37
	Diuron	95.7	75.6	80.9		3.58
	Fenuron	115	112	108		3.75
	Fluridone	112	87.6	85.3		2.39
	Imidacloprid	112	186	198		5.35
	Linuron	105	86.2	86.8		0.670
	MCP	92.8	68.5	70.1		2.41
	Primidone	102	125	119		4.43
	Triclopyr	94.0	65.6	71.2		8.26

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1942083, 1942084, 1942085, 1942086
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1942083, 1942084, 1942085, 1942086
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1942083, 1942084, 1942085, 1942086
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1942087, 1942088, 1942089, 1942090
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1942087, 1942088, 1942089, 1942090
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1942087, 1942088, 1942089, 1942090
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1942087, 1942088, 1942089, 1942090
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1942091, 1942092, 1942093, 1942094
EPA 8321B / E31780	Analysis of sucralose in water matrices by HPLC/MS/MS	1942103, 1942104
SM 2120 B / E31780	True Color measured at 450 nm	1942083, 1942084, 1942085, 1942086
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1942083, 1942084, 1942085, 1942086
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1942083, 1942084, 1942085, 1942086
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1942083, 1942084, 1942085, 1942086
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1942083, 1942084, 1942085, 1942086
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1942087, 1942088, 1942089, 1942090
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1942103, 1942104
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1942103, 1942104

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	11/02/2017			11/02/2017 17:33	DeAsia Armster	1942083, 1942084, 1942085, 1942086
EPA 300.0 Rev. 2.1	11/02/2017			11/04/2017	Irina Carbone	1942083, 1942084, 1942085, 1942086
EPA 350.1 Rev. 2.0	11/02/2017			11/14/2017	Sofia Elnemr	1942087, 1942088, 1942089, 1942090
EPA 351.2 Rev. 2.0	11/02/2017	11/08/2017	Adrian Shelby	11/14/2017	Tanya Welborn	1942088, 1942089, 1942090
	11/02/2017	11/20/2017	Adrian Shelby	11/20/2017	Joseph Suarez	1942087
EPA 353.2 Rev. 2.0	11/02/2017			11/08/2017	Beverly Y. Sanders	1942087, 1942088, 1942089, 1942090
EPA 365.1 Rev. 2.0	11/02/2017	11/06/2017	Sima Feizi	11/07/2017	Lipi Saha	1942087, 1942088, 1942089, 1942090
EPA 365.1 Rev. 2.0 dissolved	11/02/2017			11/02/2017 13:51	Megan Treadwell	1942091
	11/02/2017			11/02/2017 13:52	Megan Treadwell	1942092
	11/02/2017			11/02/2017 13:53	Megan Treadwell	1942093
	11/02/2017			11/02/2017 13:54	Megan Treadwell	1942094
EPA 8321B	11/02/2017	11/02/2017	Juyoung Kim	11/03/2017	Juyoung Kim	1942103, 1942104
SM 2120 B	11/02/2017			11/02/2017 15:01	Tanya Welborn	1942083
	11/02/2017			11/02/2017 15:02	Tanya Welborn	1942084
	11/02/2017			11/02/2017 15:03	Tanya Welborn	1942085
	11/02/2017			11/02/2017 15:04	Tanya Welborn	1942086
SM 2320 B-97	11/02/2017			11/09/2017	Dale L. Simmons	1942083, 1942084, 1942085, 1942086
SM 2540 C-97	11/02/2017			11/06/2017	Yijie Li	1942083, 1942084, 1942085, 1942086
SM 2540 D-97	11/02/2017			11/06/2017	Yijie Li	1942083, 1942084, 1942085, 1942086
SM 4500 F-C-97	11/02/2017			11/09/2017	Dale L. Simmons	1942083, 1942084, 1942085, 1942086
SM 5310 B-00	11/02/2017			11/10/2017	Ping Hua	1942087, 1942088, 1942089, 1942090
USGS O-2060-01	11/02/2017	11/02/2017	Hoor Shaik	11/10/2017	S. M. Reddy	1942103, 1942104
	11/02/2017	11/27/2017	Hoor Shaik	11/29/2017	Julie Michelle Frank	1942103, 1942104