

Chemical Analysis Report

CEN-DIST-2018-08-31-01

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

Event Description: **kasey + LVI / Dot**
Request ID: **RQ-2018-08-27-31**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 20-SEP-2018 12:07

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: LAKE DOT @ CENTER (2997Q)

Collection Date/Time: 08/30/2018 09:41

Field ID: G2CE0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021478	EPA 8321B	2,4-D	0.030		ug/L	P350923	
		Sucralose**	0.033	I	ug/L	P350994	
		Bentazon	0.027		ug/L	P350923	MS
		MCP	0.0074	I	ug/L	P350923	
		Triclopyr**	0.0040	U	ug/L	P350923	
		Imidacloprid	0.035		ug/L	P350923	
		Diuron	0.031		ug/L	P350923	
		Pyraclostrobin**	0.0020	U	ug/L	P350923	
		Primidone**	0.0040	U	ug/L	P350923	
		Linuron	0.0040	U	ug/L	P350923	
		Acetaminophen**	0.034		ug/L	P350923	
		Fenuron	0.016	U	ug/L	P350923	
		Imazapyr**	0.0040	U	ug/L	P350923	
		Carbamazepine**	8.0E-04	U	ug/L	P350923	
		Fluridone**	5.9E-04	I	ug/L	P350923	
		Hydrocodone**	8.0E-04	U	ug/L	P350923	
		Naproxen**	0.0080	U	ug/L	P350923	
		Ibuprofen**	0.020	U	ug/L	P350923	
		Acesulfame K**	0.10	U	ug/L	P350994	

Sample Location: KASEY LAKE @ CENTER (3002Q)

Collection Date/Time: 08/30/2018 10:35

Field ID: G2CE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021471	EPA 180.1 Rev. 2.0	Turbidity	5.8		NTU	P351100	
	EPA 300.0 Rev. 2.1	Chloride	6.8		mg Cl/L	P351466	
		Sulfate	4.2		mg SO4/L	P351468	
		Color (true)	31		PCU	P351037	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P351369	
	SM 2540 C-97	TDS	70		mg/L	P351409	
	SM 2540 D-97	TSS	8	I	mg/L	P351379	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P351373	
2021472	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P351281	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P351111	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351310	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P351080	
	SM 5310 B-00	Organic Carbon	7.3		mg C/L	P351134	
2021473	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351041	
2021479	EPA 200.7 Rev. 4.4	Calcium	12.0		mg/L	P351064	
		Iron	120		ug/L	P351064	
		Magnesium	1.29		mg/L	P351064	
		Potassium	1.2		mg/L	P351064	
		Sodium	4.1		mg/L	P351064	
		Zinc	5.0	U	ug/L	P351064	
	EPA 200.8 Rev. 5.4	Arsenic	0.23		ug/L	P351064	
		Cadmium	0.020	U	ug/L	P351064	
		Chromium	0.40	U	ug/L	P351064	
		Copper	0.44	I	ug/L	P351064	
		Lead	0.074	I	ug/L	P351064	
		Nickel	0.20	U	ug/L	P351064	
		Silver	0.010	U	ug/L	P351064	

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: P351100

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351064

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: P351064

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: P351466

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351468

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351281

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351111

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P351310

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P351080

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P351041

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

Reference Method: EPA 8321B
 Batch ID: P350923

Component	Result	Code	Units
2,4-D	0.0020	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	8.0E-04	U	ug/L
Diuron	0.0020	U	ug/L
Fenuron	0.017	I	ug/L
Fluridone	4.0E-04	U	ug/L
Hydrocodone	8.0E-04	U	ug/L
Ibuprofen	0.020	U	ug/L
Imazapyr	0.0040	U	ug/L
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCPP	0.0020	U	ug/L
Naproxen	0.0080	U	ug/L
Primidone	0.0040	U	ug/L
Pyraclostrobin	0.0020	U	ug/L
Triclopyr	0.0040	U	ug/L

Reference Method: EPA 8321B
 Batch ID: P350994

Component	Result	Code	Units
Acesulfame K	0.10	U	ug/L
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
 Batch ID: P351037

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P351369

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

Reference Method: SM 2540 C-97
Batch ID: P351409

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351379

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P351373

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P351134

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: P351064

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	104		P	85 - 115
Sodium	100		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351064

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	99.8		P	85 - 115
Chromium	99.0		P	85 - 115
Copper	100		P	85 - 115
Lead	104		P	85 - 115
Nickel	100		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351466

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: P351468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351281

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351310

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351041

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P350923

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	67.7		P	40 - 150
Acetaminophen	113		P	30 - 150
Bentazon	59.1		P	30 - 150
Carbamazepine	70.4		P	40 - 150
Diuron	65.8		P	40 - 150
Fenuron	93.5		P	40 - 150
Fluridone	86.7		P	40 - 150
Hydrocodone	110		P	40 - 150
Ibuprofen	72.9		P	40 - 150
Imazapyr	91.0		P	40 - 150
Imidacloprid	105		P	40 - 160
Linuron	60.5		P	40 - 150
MCPP	73.5		P	40 - 150
Naproxen	94.1		P	40 - 150
Primidone	105		P	40 - 150
Pyraclostrobin	72.9		P	40 - 150
Triclopyr	49.2		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P350994

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Acesulfame K	93.9		P	40 - 150
Sucralose	81.3		P	40 - 150

Reference Method: SM 2120 B
Batch ID: P351037

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351369

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P351373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P351134

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021180	Calcium	102		P	80 - 120
2021180	Iron	108		P	80 - 120
2021180	Magnesium	110		P	80 - 120
2021180	Potassium	104		P	80 - 120
2021180	Sodium	99.4		P	80 - 120
2021180	Zinc	105		P	80 - 120
2021276	Calcium	108		P	80 - 120
2021276	Iron	112	108	P/P	80 - 120
2021276	Magnesium	107		P	80 - 120
2021276	Potassium	107	102	P/P	80 - 120
2021276	Sodium	102		P	80 - 120
2021276	Zinc	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021180	Arsenic	101		P	80 - 120
2021180	Cadmium	103		P	80 - 120
2021180	Chromium	98.9		P	80 - 120
2021180	Copper	95.4		P	80 - 120
2021180	Lead	104		P	80 - 120
2021180	Nickel	97.7		P	80 - 120
2021180	Silver	103		P	80 - 120
2021276	Arsenic	103	101	P/P	80 - 120
2021276	Cadmium	103	103	P/P	80 - 120
2021276	Chromium	99.5	97.6	P/P	80 - 120
2021276	Copper	94.7	92.2	P/P	80 - 120
2021276	Lead	100	99.2	P/P	80 - 120
2021276	Nickel	96.5	94.1	P/P	80 - 120
2021276	Silver	101	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351466

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021293	Chloride	93.3		P	90 - 110
2021471	Chloride	90.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021293	Sulfate	93.9		P	90 - 110
2021471	Sulfate	91.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021408	Ammonia-N	99.3	99.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P351111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021472	Kjeldahl Nitrogen	95.4	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P351310

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021408	NO2NO3-N	99.0	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P351080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021418	Total-P	95.7	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P351041

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021473	O-Phosphate-P	95.4	96.0	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P350923

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020945	2,4-D	99.8	107	P/P	40 - 150
2020945	Acetaminophen	127	126	P/P	30 - 150
2020945	Bentazon	20.8	18.4	F/F	30 - 150
2020945	Carbamazepine	56.4	48.5	P/P	40 - 150
2020945	Diuron	46.5	45.9	P/P	40 - 150
2020945	Fenuron	44.4	40.2	P/P	40 - 150
2020945	Fluridone	60.6	59.1	P/P	40 - 150
2020945	Hydrocodone	95.7	89.5	P/P	40 - 150
2020945	Ibuprofen	77.2	84.0	P/P	40 - 150
2020945	Imazapyr	88.1	81.6	P/P	40 - 150
2020945	Imidacloprid	96.2	84.6	P/P	40 - 160
2020945	Linuron	55.3	53.4	P/P	40 - 150
2020945	MCP	109	114	P/P	40 - 150
2020945	Naproxen	119	107	P/P	40 - 150
2020945	Primidone	62.1	61.0	P/P	40 - 150
2020945	Pyraclostrobin	79.4	73.4	P/P	40 - 150
2020945	Triclopyr	118	124	P/P	40 - 150

Reference Method: EPA 8321B
 Batch ID: P350994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021271	Acesulfame K	64.1	63.3	P/P	40 - 150
2021271	Sucralose	68.7	78.8	P/P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P351373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021242	Fluoride	100	99.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P351134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021405	Organic Carbon	103		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P351100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021404	Turbidity	1.06	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021276	Calcium	1.79	Spike	P	0 - 20
2021276	Iron	3.11	Spike	P	0 - 20
2021276	Magnesium	3.58	Spike	P	0 - 20
2021276	Potassium	2.96	Spike	P	0 - 20
2021276	Sodium	2.17	Spike	P	0 - 20
2021276	Zinc	0.545	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021276	Arsenic	1.88	Spike	P	0 - 20
2021276	Cadmium	0.697	Spike	P	0 - 20
2021276	Chromium	1.96	Spike	P	0 - 20
2021276	Copper	2.64	Spike	P	0 - 20
2021276	Lead	1.20	Spike	P	0 - 20
2021276	Nickel	2.46	Spike	P	0 - 20
2021276	Silver	0.208	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021293	Chloride	1.11	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021293	Sulfate	1.85	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021408	Ammonia-N	0.268	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021472	Kjeldahl Nitrogen	1.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021408	NO2NO3-N	2.88	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021418	Total-P	0.866	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021473	O-Phosphate-P	0.627	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P350923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020945	2,4-D	6.51	Spike	P	0 - 30
2020945	Acetaminophen	0.965	Spike	P	0 - 30
2020945	Bentazon	12.5	Spike	P	0 - 30
2020945	Carbamazepine	15.0	Spike	P	0 - 30
2020945	Diuron	1.47	Spike	P	0 - 30
2020945	Fenuron	9.95	Spike	P	0 - 30
2020945	Fluridone	2.48	Spike	P	0 - 30
2020945	Hydrocodone	6.75	Spike	P	0 - 30
2020945	Ibuprofen	8.41	Spike	P	0 - 30
2020945	Imazapyr	6.95	Spike	P	0 - 30
2020945	Imidacloprid	12.8	Spike	P	0 - 30
2020945	Linuron	3.57	Spike	P	0 - 30
2020945	MCPP	3.79	Spike	P	0 - 30
2020945	Naproxen	10.8	Spike	P	0 - 30
2020945	Primidone	1.79	Spike	P	0 - 30
2020945	Pyraclostrobin	7.90	Spike	P	0 - 30
2020945	Triclopyr	4.43	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P350994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P350994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021271	Acesulfame K	1.25	Spike	P	0 - 30
2021271	Sucralose	12.2	Spike	P	0 - 30

Reference Method: SM 2120 B
 Batch ID: P351037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021407	Color (true)	0.574	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P351369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021242	Total Alkalinity	0.607	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
 Batch ID: P351409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021294	TDS	3.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P351373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021242	Fluoride	0.979	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
 Batch ID: P351134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021405	Organic Carbon	0.479	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 Surrogates

Lab Sample ID: 2021478
Field Sample ID: G2CE0067

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	125	P	30 - 160
EPA 8321B	Acetaminophen-d4	133	P	30 - 160
EPA 8321B	Carbamazepine-d10	55.7	P	30 - 160
EPA 8321B	Diuron-d6	57.7	P	30 - 160
EPA 8321B	Endothall-d6	117	P	40 - 160
EPA 8321B	Endothall-d6	117	P	40 - 160
EPA 8321B	Ibuprofen-d3	79.0	P	30 - 160
EPA 8321B	Primidone-d5	95.9	P	30 - 160
EPA 8321B	Sucralose-d6	98.7	P	40 - 160
EPA 8321B	Sucralose-d6	98.7	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A86248
Included Lab Sample IDs: 2021471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A86249
Included Lab Sample IDs: 2021473

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

Reference Method: EPA 8321B
Run ID: A86253
Included Lab Sample IDs: 2021478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	68.2	72.4	P/P	50 - 150
Acetaminophen	111	105	P/P	60 - 160
Bentazon	62.4	60.3	P/P	50 - 160
Carbamazepine	71.8	70.2	P/P	60 - 160
Diuron	63.2	72.6	P/P	60 - 150
Fenuron	97.0	90.1	P/P	60 - 150
Fluridone	72.9	72.6	P/P	60 - 160
Hydrocodone	99.0	108	P/P	60 - 150
Ibuprofen	138	113	P/P	50 - 160
Imazapyr	78.5	90.0	P/P	50 - 150
Imidacloprid	75.4	79.2	P/P	60 - 150
Linuron	83.9	74.0	P/P	60 - 150
MCPP	72.5	71.3	P/P	50 - 150
Naproxen	75.0	74.1	P/P	50 - 160
Primidone	92.9	88.9	P/P	60 - 150
Pyraclostrobin	93.3	97.3	P/P	60 - 150
Triclopyr	84.3	65.7	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86278
Included Lab Sample IDs: 2021472

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A86283
Included Lab Sample IDs: 2021471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: SM 5310 B-00
Run ID: A86299
Included Lab Sample IDs: 2021472

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

Reference Method: SM 5310 B-00
Run ID: A86299
Included Lab Sample IDs: 2021472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	95.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A86302
Included Lab Sample IDs: 2021478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acesulfame K	102	94.9	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86315
Included Lab Sample IDs: 2021472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.2	93.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A86318
Included Lab Sample IDs: 2021479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.7	P/P	90 - 110
Iron	101	99.6	P/P	90 - 110
Magnesium	99.7	98.9	P/P	90 - 110
Potassium	96.9	94.8	P/P	90 - 110
Sodium	96.7	94.1	P/P	90 - 110
Zinc	99.3	99.7	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A86330
Included Lab Sample IDs: 2021478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	84.2	89.2	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86348
Included Lab Sample IDs: 2021472

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86354
Included Lab Sample IDs: 2021472

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A86387
Included Lab Sample IDs: 2021471

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

Reference Method: SM 4500 F-C-97
Run ID: A86387
Included Lab Sample IDs: 2021471

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A86418
Included Lab Sample IDs: 2021471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	101	P/P	90 - 110
Sulfate	97.2	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A86465
Included Lab Sample IDs: 2021479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	91.6	93.7	P/P	90 - 110
Cadmium	92.2	93.5	P/P	90 - 110
Chromium	91.8	93.5	P/P	90 - 110
Copper	92.5	94.7	P/P	90 - 110
Lead	104	105	P/P	90 - 110
Nickel	92.4	93.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A86535
Included Lab Sample IDs: 2021479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.6	96.8	P/P	90 - 110

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

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.06	
EPA 200.7 Rev. 4.4	Calcium	104	102	108				1.79
	Iron	107	108	112	108			3.11
	Magnesium	106	110	107				3.58
	Potassium	104	104	107	102			2.96
	Sodium	100	99.4	102				2.17
	Zinc	103	105	103	102			0.545
EPA 200.8 Rev. 5.4	Arsenic	103	101	103	101			1.88
	Cadmium	99.8	103	103	103			0.697
	Chromium	99.0	98.9	99.5	97.6			1.96
	Copper	100	95.4	94.7	92.2			2.64
	Lead	104	104	100	99.2			1.20
	Nickel	100	97.7	96.5	94.1			2.46
	Silver	103	103	101	102			0.208
EPA 300.0 Rev. 2.1	Chloride	95.1	93.3	90.8			1.11	
	Sulfate	93.6	93.9	91.2			1.85	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.3	99.0				0.268
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.4	95.4	98.1				1.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	99.0	102				2.88
EPA 365.1 Rev. 2.0	Total-P	97.8	95.7	96.7				0.866
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	95.4	96.0				0.627
EPA 8321B	2,4-D	67.7	99.8	107				6.51
	Acesulfame K	93.9	64.1	63.3				1.25
	Acetaminophen	113	127	126				0.965
	Bentazon	59.1	20.8	18.4				12.5
	Carbamazepine	70.4	56.4	48.5				15.0
	Diuron	65.8	46.5	45.9				1.47
	Fenuron	93.5	44.4	40.2				9.95
	Fluridone	86.7	60.6	59.1				2.48
	Hydrocodone	110	95.7	89.5				6.75
	Ibuprofen	72.9	84.0	77.2				8.41
	Imazapyr	91.0	88.1	81.6				6.95
	Imidacloprid	105	96.2	84.6				12.8
	Linuron	60.5	55.3	53.4				3.57
	MCPP	73.5	114	109				3.79
	Naproxen	94.1	119	107				10.8
	Primidone	105	62.1	61.0				1.79
	Pyraclostrobin	72.9	79.4	73.4				7.90
	Sucralose	81.3	68.7	78.8				12.2
	Triclopyr	49.2	118	124				4.43
SM 2120 B	Color (true)	98.9					0.574	
SM 2320 B-97	Total Alkalinity	103					0.607	
SM 2540 C-97	TDS						3.08	
SM 4500 F-C-97	Fluoride	101	100	99.1				0.979
SM 5310 B-00	Organic Carbon	95.0	103					0.479

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2021471
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2021479

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2021479
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2021471
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2021471
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2021472
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2021472
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2021472
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2021472
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2021473
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	2021478
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	2021478
SM 2120 B / E31780	True Color measured at 450 nm	2021471
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2021471
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2021471
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2021471
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2021471
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2021472

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	08/31/2018			08/31/2018 14:53	Megan Treadwell	2021471
EPA 200.7 Rev. 4.4	08/31/2018	09/04/2018 13:35	Elliott D. Healy	09/06/2018 14:01	Betina Topolski	2021479
EPA 200.8 Rev. 5.4	08/31/2018	09/04/2018 13:35	Elliott D. Healy	09/12/2018 20:35	Robert K Palmer	2021479
	08/31/2018	09/04/2018 13:35	Elliott D. Healy	09/14/2018 23:59	Robert K Palmer	2021479
EPA 300.0 Rev. 2.1	08/31/2018			09/10/2018 20:07	Lipi Saha	2021471
EPA 350.1 Rev. 2.0	08/31/2018			09/06/2018 12:10	Ping Hua	2021472
EPA 351.2 Rev. 2.0	08/31/2018	09/05/2018 15:00	Adrian Shelby	09/06/2018 11:59	Joseph Suarez	2021472
EPA 353.2 Rev. 2.0	08/31/2018			09/07/2018 14:26	Lauren Bottorf	2021472
EPA 365.1 Rev. 2.0	08/31/2018	09/04/2018 14:44	Sima Feizi	09/05/2018 08:55	Beverly Y. Sanders	2021472
EPA 365.1 Rev. 2.0 dissolved	08/31/2018			08/31/2018 16:08	Anthony C. Onicha	2021473
EPA 8321B	08/31/2018	08/31/2018 13:30	Hoor Shaik	09/01/2018 21:14	Juyoung Kim	2021478
	08/31/2018	08/31/2018 13:30	Hoor Shaik	09/02/2018 09:56	Juyoung Kim	2021478
	08/31/2018	09/05/2018 11:20	Mohammad Ghaffari	09/05/2018 13:57	Mohammad Ghaffari	2021478
	08/31/2018	09/05/2018 11:20	Mohammad Ghaffari	09/06/2018 14:38	Mohammad Ghaffari	2021478
SM 2120 B	08/31/2018			08/31/2018 16:34	Julia Storbeck	2021471
SM 2320 B-97	08/31/2018			09/07/2018 09:58	Dale L. Simmons	2021471
SM 2540 C-97	08/31/2018			09/05/2018 14:02	Yijie Li	2021471
SM 2540 D-97	08/31/2018			09/05/2018 14:02	Yijie Li	2021471
SM 4500 F-C-97	08/31/2018			09/07/2018 09:58	Dale L. Simmons	2021471
SM 5310 B-00	08/31/2018			09/05/2018 12:07	Megan Treadwell	2021472