

Chemical Analysis Report

SO-DIST-2017-10-17-03

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

Event Description: **Collier County Tracers & Markers**

Request ID: **RQ-2017-05-01-13**

Customer: **SO-DIST**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Corey Anderson

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Certified by: Colin Wright, Program Administrator

Date Certified: 02-NOV-2017 13:08

A handwritten signature in black ink, appearing to read "Colin Wright", is placed over a light gray rectangular 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 group are included in this report: 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: COC AT 41

Collection Date/Time: 10/16/2017 00:01

Field ID: AF44505

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1937351	EPA 8321B	Sucralose**	0.12		ug/L	P333553	
	USGS O-2060-01	2,4-D	0.041		ug/L	P333492	
		Diuron	0.0053		ug/L	P333492	
		Fenuron	0.0080	U	ug/L	P333492	RPD
		Imidacloprid	0.039		ug/L	P333492	MS
		Bentazon	0.033	J	ug/L	P333492	LCS, MS
		Linuron	0.0040	U	ug/L	P333492	
		Acetaminophen**	0.0080	U	ug/L	P333492	
		MCP	0.0020	U	ug/L	P333492	
		Carbamazepine**	4.5E-04	I	ug/L	P333492	
		Triclopyr**	0.0040	U	ug/L	P333492	
		Primidone**	0.0040	U	ug/L	P333492	
		Fluridone**	0.047		ug/L	P333492	

Ref. Method and Comment:

USGS O-2060-01: Results confirmed in re-extraction. Refer to the narrative for an explanation of QC Codes.

Sample Location: IMKFSH CK

Collection Date/Time: 10/16/2017 10:11

Field ID: AF43013

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1937352	EPA 8321B	Sucralose**	0.023	I	ug/L	P333553	
	USGS O-2060-01	2,4-D	0.0034	I	ug/L	P333492	
		Diuron	0.082		ug/L	P333492	
		Fenuron	0.0080	U	ug/L	P333492	RPD
		Imidacloprid	0.15		ug/L	P333492	MS
		Bentazon	0.0012	IJ	ug/L	P333492	LCS, MS
		Linuron	0.0040	U	ug/L	P333492	
		Acetaminophen**	0.0080	U	ug/L	P333492	
		MCP	0.0020	U	ug/L	P333492	
		Carbamazepine**	4.0E-04	U	ug/L	P333492	
		Triclopyr**	0.0040	U	ug/L	P333492	
		Primidone**	0.0040	U	ug/L	P333492	
		Fluridone**	0.0017		ug/L	P333492	

Ref. Method and Comment:

USGS O-2060-01: Refer to the narrative for an explanation of QC Codes.

Sample Location: IMK5LGH

Collection Date/Time: 10/16/2017 12:09

Field ID: AF43014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1937353	EPA 8321B	Sucralose**	0.033	I	ug/L	P333553	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P333492	
		Diuron	0.0032	I	ug/L	P333492	
		Fenuron	0.0080	U	ug/L	P333492	RPD
		Imidacloprid	0.017		ug/L	P333492	MS

Field ID: AF43014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1937353	USGS O-2060-01	Bentazon	8.0E-04	UJ	ug/L	P333492	LCS, MS
		Linuron	0.0040	U	ug/L	P333492	
		Acetaminophen**	0.010	I	ug/L	P333492	
		MCP	0.0020	U	ug/L	P333492	
		Carbamazepine**	4.0E-04	U	ug/L	P333492	
		Triclopyr**	0.0040	U	ug/L	P333492	
		Primidone**	0.0040	U	ug/L	P333492	
		Fluridone**	4.0E-04	U	ug/L	P333492	

Ref. Method and Comment:
 USGS O-2060-01: Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: EPA 8321B
 Batch ID: P333553

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: USGS O-2060-01
 Batch ID: P333492

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	4.0E-04	U	ug/L
Diuron	8.0E-04	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
 Batch ID: P333553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	92.3		P	40 - 150

Reference Method: USGS O-2060-01
 Batch ID: P333492

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	67.9		P	40 - 150
Acetaminophen	102		P	30 - 150
Bentazon	24.4		F	30 - 150

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: USGS O-2060-01
 Batch ID: P333492

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Carbamazepine	66.4		P	40 - 150
Diuron	104		P	40 - 150
Fenuron	98.4		P	40 - 150
Fluridone	105		P	40 - 150
Imidacloprid	76.9		P	40 - 160
Linuron	113		P	40 - 150
MCP	63.7		P	40 - 150
Primidone	91.1		P	40 - 150
Triclopyr	62.0		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
 Batch ID: P333553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1937062	Sucralose	47.0	48.8	P/P	40 - 150

Reference Method: USGS O-2060-01
 Batch ID: P333492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1937158	2,4-D	61.0	65.5	P/P	40 - 150
1937158	Acetaminophen	100	99.6	P/P	30 - 150
1937158	Bentazon	15.0	18.2	F/F	30 - 150
1937158	Carbamazepine	124	127	P/P	40 - 150
1937158	Diuron	91.0	93.4	P/P	40 - 150
1937158	Fenuron	75.8	124	P/P	40 - 150
1937158	Fluridone	78.8	90.4	P/P	40 - 150
1937158	Imidacloprid	200	197	F/F	40 - 160
1937158	Linuron	97.1	99.5	P/P	40 - 150
1937158	MCP	45.6	43.3	P/P	40 - 150
1937158	Primidone	111	102	P/P	40 - 150
1937158	Triclopyr	41.1	44.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P333553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1937062	Sucralose	2.83	Spike	P	0 - 30

Reference Method: USGS O-2060-01
 Batch ID: P333492

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

Reference Method: USGS O-2060-01
Batch ID: P333492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1937158	2,4-D	7.18	Spike	P	0 - 30
1937158	Acetaminophen	0.461	Spike	P	0 - 30
1937158	Bentazon	10.2	Spike	P	0 - 30
1937158	Carbamazepine	1.95	Spike	P	0 - 30
1937158	Diuron	1.78	Spike	P	0 - 30
1937158	Fenuron	37.5	Spike	F	0 - 30
1937158	Fluridone	11.1	Spike	P	0 - 30
1937158	Imidacloprid	1.41	Spike	P	0 - 30
1937158	Linuron	2.38	Spike	P	0 - 30
1937158	MCP	4.99	Spike	P	0 - 30
1937158	Primidone	7.11	Spike	P	0 - 30
1937158	Triclopyr	8.34	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: 1937351
Field Sample ID: AF44505

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	92.7	P	30 - 160
EPA 8321B	Carbamazepine-d10	95.6	P	30 - 160
EPA 8321B	Diuron-d6	62.6	P	30 - 160
EPA 8321B	Primidone-d5	82.9	P	30 - 160
EPA 8321B	Sucralose-d6	57.3	P	40 - 160
USGS O-2060-01	2,4-D-d3	61.9	P	40 - 160
USGS O-2060-01	Acetaminophen-d4	92.7	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	95.6	P	30 - 160
USGS O-2060-01	Diuron-d6	62.6	P	30 - 160
USGS O-2060-01	Primidone-d5	82.9	P	30 - 160
USGS O-2060-01	Sucralose-d6	57.3	P	40 - 160

Lab Sample ID: 1937352
Field Sample ID: AF43013

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	88.1	P	30 - 160
EPA 8321B	Carbamazepine-d10	90.9	P	30 - 160
EPA 8321B	Diuron-d6	59.6	P	30 - 160
EPA 8321B	Primidone-d5	82.8	P	30 - 160
EPA 8321B	Sucralose-d6	58.2	P	40 - 160
USGS O-2060-01	2,4-D-d3	66.2	P	40 - 160
USGS O-2060-01	Acetaminophen-d4	88.1	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	90.9	P	30 - 160
USGS O-2060-01	Diuron-d6	59.6	P	30 - 160
USGS O-2060-01	Primidone-d5	82.8	P	30 - 160
USGS O-2060-01	Sucralose-d6	58.2	P	40 - 160

Quality Assurance Report Surrogates

Lab Sample ID: 1937353
Field Sample ID: AF43014

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	92.2	P	30 - 160
EPA 8321B	Carbamazepine-d10	88.0	P	30 - 160
EPA 8321B	Diuron-d6	56.9	P	30 - 160
EPA 8321B	Primidone-d5	84.4	P	30 - 160
EPA 8321B	Sucralose-d6	53.2	P	40 - 160
USGS O-2060-01	2,4-D-d3	55.3	P	40 - 160
USGS O-2060-01	Acetaminophen-d4	92.2	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	88.0	P	30 - 160
USGS O-2060-01	Diuron-d6	56.9	P	30 - 160
USGS O-2060-01	Primidone-d5	84.4	P	30 - 160
USGS O-2060-01	Sucralose-d6	53.2	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A79673
Included Lab Sample IDs: 1937351, 1937352, 1937353

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	90.2	88.1	P/P	60 - 150

Reference Method: USGS O-2060-01
Run ID: A79847
Included Lab Sample IDs: 1937351, 1937352, 1937353

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	92.1	94.7	P/P	50 - 150
2,4-D	94.7	101	P/P	50 - 150
Acetaminophen	106	106	P/P	60 - 150
Acetaminophen	106	107	P/P	60 - 150
Bentazon	92.1	90.8	P/P	50 - 150
Bentazon	92.9	92.1	P/P	50 - 150
Carbamazepine	109	109	P/P	60 - 150
Carbamazepine	109	110	P/P	60 - 150
Diuron	107	110	P/P	60 - 150
Diuron	112	107	P/P	60 - 150
Fenuron	105	105	P/P	60 - 150
Fenuron	105	108	P/P	60 - 150
Fluridone	108	109	P/P	60 - 160
Fluridone	109	108	P/P	60 - 160
Imidacloprid	100	98.5	P/P	60 - 150
Imidacloprid	98.5	98.1	P/P	60 - 150
Linuron	105	106	P/P	60 - 150
Linuron	117	105	P/P	60 - 150
MCP	102	91.2	P/P	50 - 150
MCP	91.2	92.9	P/P	50 - 150
Primidone	97.7	104	P/P	60 - 150
Primidone	98.1	97.7	P/P	60 - 150
Triclopyr	101	96.1	P/P	50 - 150
Triclopyr	99.6	101	P/P	50 - 150

Quality Assurance Report Calibration Verification

* 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 SMP	MS
			LCS			
EPA 8321B	Sucralose	92.3	47.0	48.8		2.83
USGS O-2060-01	2,4-D	67.9	61.0	65.5		7.18
	Acetaminophen	102	100	99.6		0.461
	Bentazon	24.4	15.0	18.2		10.2
	Carbamazepine	66.4	124	127		1.95
	Diuron	104	91.0	93.4		1.78
	Fenuron	98.4	75.8	124		37.5
	Fluridone	105	78.8	90.4		11.1
	Imidacloprid	76.9	200	197		1.41
	Linuron	113	97.1	99.5		2.38
	MCP	63.7	45.6	43.3		4.99
	Primidone	91.1	111	102		7.11
	Triclopyr	62.0	41.1	44.7		8.34

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 8321B / E31780	Analysis of sucralose in water matrices by HPLC/MS/MS	1937351, 1937352, 1937353
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1937351, 1937352, 1937353
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1937351, 1937352, 1937353

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	10/17/2017	10/18/2017	Juyoung Kim	10/19/2017	Juyoung Kim	1937351, 1937352, 1937353
USGS O-2060-01	10/17/2017	10/19/2017	Hoor Shaik	10/24/2017	Julie Michelle Frank	1937351, 1937352
	10/17/2017	10/19/2017	Hoor Shaik	10/25/2017	Julie Michelle Frank	1937353