

Chemical Analysis Report

SO-DIST-2018-03-20-01

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

Event Description: **Collier County Markers & Tracers (GORDONRIV)**
Request ID: **RQ-2018-02-19-45**
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: Maryann Dugan

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: Colin Wright, Program Administrator

Date Certified: 09-APR-2018 13:43

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: GORDON RIV

Collection Date/Time: 03/19/2018 12:44

Field ID: AF47620

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975850	EPA 8321B	2,4-D	0.012		ug/L	P341805	
		Sucralose**	1.4		ug/L	P341684	
		Bentazon	0.10		ug/L	P341805	MS
		MCP	0.0020	U	ug/L	P341805	
		Triclopyr**	0.0040	U	ug/L	P341805	
		Imidacloprid	0.060		ug/L	P341805	MS
		Diuron	0.0020	U	ug/L	P341805	
		Pyraclostrobin**	0.0020	U	ug/L	P341805	
		Primidone**	0.016		ug/L	P341805	
		Linuron	0.0040	U	ug/L	P341805	
		Acetaminophen**	0.0080	U	ug/L	P341805	
		Fenuron	0.016	U	ug/L	P341805	
		Imazapyr**	0.031		ug/L	P341805	MS
		Carbamazepine**	0.0013	I	ug/L	P341805	
		Fluridone**	0.035		ug/L	P341805	

Ref. Method and Comment:

EPA 8321B: MS accuracy and precision for 2,4-D could not be assessed due to high concentration of parameter in the spiked sample. Fenuron was detected in the method blank slightly above the MDL.

Quality Assurance Report Method Blank Results

Reference Method: EPA 8321B

Batch ID: P341684

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: EPA 8321B

Batch ID: P341805

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	0.0020	U	ug/L
Fenuron	0.018	I	ug/L
Fluridone	8.0E-04	U	ug/L
Imazapyr	0.0040	U	ug/L
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Pyraclostrobin	0.0020	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P341684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	115		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P341805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	80.4		P	40 - 150
Acetaminophen	100		P	30 - 150
Bentazon	74.9		P	30 - 150
Carbamazepine	68.5		P	40 - 150
Diuron	69.1		P	40 - 150
Fenuron	106		P	40 - 150
Fluridone	62.5		P	40 - 150
Imazapyr	61.0		P	40 - 150
Imidacloprid	91.2		P	40 - 160
Linuron	71.4		P	40 - 150
MCP	82.0		P	40 - 150
Primidone	97.7		P	40 - 150
Pyraclostrobin	62.8		P	40 - 150
Triclopyr	73.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P341684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975318	Sucralose	110	97.2	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P341805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976131	Acetaminophen	128	128	P/P	30 - 150
1976131	Bentazon	21.6	20.0	F/F	30 - 150
1976131	Carbamazepine	87.3	74.3	P/P	40 - 150
1976131	Diuron	62.6	61.2	P/P	40 - 150
1976131	Fenuron	93.7	95.2	P/P	40 - 150
1976131	Fluridone	47.8	46.5	P/P	40 - 150
1976131	Imazapyr	38.5	53.0	F/P	40 - 150
1976131	Imidacloprid	179	179	F/F	40 - 160
1976131	Linuron	69.0	75.2	P/P	40 - 150
1976131	MCP	53.2	52.8	P/P	40 - 150
1976131	Primidone	110	113	P/P	40 - 150
1976131	Pyraclostrobin	61.0	52.7	P/P	40 - 150
1976131	Triclopyr	46.8	42.5	P/P	40 - 150

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P341684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975318	Sucralose	9.71	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P341805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976131	Acetaminophen	0.0564	Spike	P	0 - 30
1976131	Bentazon	5.65	Spike	P	0 - 30
1976131	Carbamazepine	15.9	Spike	P	0 - 30
1976131	Diuron	2.07	Spike	P	0 - 30
1976131	Fenuron	1.56	Spike	P	0 - 30
1976131	Fluridone	2.41	Spike	P	0 - 30
1976131	Imazapyr	15.0	Spike	P	0 - 30
1976131	Imidacloprid	0.0	Spike	P	0 - 30
1976131	Linuron	8.54	Spike	P	0 - 30
1976131	MCPP	0.734	Spike	P	0 - 30
1976131	Primidone	2.60	Spike	P	0 - 30
1976131	Pyraclostrobin	14.5	Spike	P	0 - 30
1976131	Triclopyr	9.72	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: 1975850
Field Sample ID: AF47620

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	91.2	P	30 - 160
EPA 8321B	Acetaminophen-d4	121	P	30 - 160
EPA 8321B	Carbamazepine-d10	73.8	P	30 - 160
EPA 8321B	Diuron-d6	75.3	P	30 - 160
EPA 8321B	Primidone-d5	110	P	30 - 160
EPA 8321B	Sucralose-d6	111	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A82866
Included Lab Sample IDs: 1975850

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	96.9	93.5	P/P	60 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A82884
Included Lab Sample IDs: 1975850

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	109	105	P/P	50 - 150
Acetaminophen	112	102	P/P	60 - 150
Bentazon	99.6	93.6	P/P	50 - 150
Carbamazepine	85.5	92.8	P/P	60 - 150
Diuron	110	116	P/P	60 - 150
Fenuron	103	98.3	P/P	60 - 150
Fluridone	111	113	P/P	60 - 160
Imazapyr	98.3	98.8	P/P	50 - 150
Imidacloprid	113	109	P/P	60 - 150
Linuron	114	119	P/P	60 - 150
MCP	110	96.8	P/P	50 - 150
Primidone	110	94.8	P/P	60 - 150
Pyraclostrobin	98.7	100	P/P	60 - 150
Triclopyr	106	93.7	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 8321B	2,4-D	80.4				
	Acetaminophen	100	128 128			0.0564
	Bentazon	74.9	21.6 20.0			5.65
	Carbamazepine	68.5	87.3 74.3			15.9
	Diuron	69.1	62.6 61.2			2.07
	Fenuron	106	93.7 95.2			1.56
	Fluridone	62.5	47.8 46.5			2.41
	Imazapyr	61.0	38.5 53.0			15.0
	Imidacloprid	91.2	179 179			0.0
	Linuron	71.4	69.0 75.2			8.54
	MCP	82.0	53.2 52.8			0.734
	Primidone	97.7	110 113			2.60
	Pyraclostrobin	62.8	61.0 52.7			14.5
	Sucralose	115	110 97.2			9.71
	Triclopyr	73.5	46.8 42.5			9.72

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	1975850
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1975850

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	03/20/2018	03/22/2018	Hoor Shaik	03/23/2018	Julie Michelle Frank	1975850
	03/20/2018	03/26/2018	Julie Michelle Frank	03/27/2018	Juyoung Kim	1975850