

Chemical Analysis Report

CEN-DIST-2017-06-14-01

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

Event Description: **UnDrain 3046+HA**
Request ID: **RQ-2017-06-19-41**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
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Certified by: Colin Wright, Program Administrator

Date Certified: 10-JUL-2017 14:05

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on 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: Nutrients.

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: Unnamed Drain @ 300m E of S. Econ Trail

Collection Date/Time: 06/13/2017 11:25

Field ID: G2CE0124

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1906143	EPA 180.1 Rev. 2.0	Turbidity	5.2		NTU	P326838	
	EPA 300.0 Rev. 2.1	Chloride	14	A	mg Cl/L	P327213	
		Sulfate	9.4	A	mg SO4/L	P327215	
	SM 2120 B	Color (true)	44		PCU	P326854	
	SM 2320 B-97	Total Alkalinity	48		mg CaCO3/L	P327364	
	SM 2540 C-97	TDS	101		mg/L	P327133	
	SM 2540 D-97	TSS	6	I	mg/L	P327462	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P327062	RPD
1906144	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P326974	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P326919	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.065		mg N/L	P326958	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P326954	
	SM 5310 B-00	Organic Carbon	7.9		mg C/L	P327417	
1906145	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.079		mg P/L	P326827	

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: P326838

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P327213

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P327215

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P326974

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P326919

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: P326958

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326954

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326827

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

Reference Method: SM 2120 B
Batch ID: P326854

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P327364

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

Reference Method: SM 2540 C-97
Batch ID: P327133

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P327462

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P327062

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P327417

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326974

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326958

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: P326954

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.8		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P327364

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

Reference Method: SM 4500 F-C-97
Batch ID: P327062

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P327417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906143	Chloride	99.2		P	90 - 110
1906231	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906143	Sulfate	95.6		P	90 - 110
1906231	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906109	Ammonia-N	98.2	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906028	Kjeldahl Nitrogen	91.9	90.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326958

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906020	NO2NO3-N	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906405	Total-P	98.7	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906024	O-Phosphate-P	97.8	95.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P327062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905970	Fluoride	94.5	97.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P327417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906144	Organic Carbon	93.7	95.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906015	Turbidity	2.93	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906143	Chloride	0.157	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906143	Sulfate	0.556	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906109	Ammonia-N	0.248	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906028	Kjeldahl Nitrogen	0.828	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326958

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906020	NO2NO3-N	0.308	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906405	Total-P	1.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906024	O-Phosphate-P	1.96	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P326854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906040	Color (true)	2.38	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P327364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905970	Total Alkalinity	0.178	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P327133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906014	TDS	3.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P327062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905970	Fluoride	3.04	Spike	F	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P327417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906144	Organic Carbon	1.38	Spike	P	0 - 20

Quality Assurance Report Precision

* 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 Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A77087

Included Lab Sample IDs: 1906145

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A77089

Included Lab Sample IDs: 1906143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A77095

Included Lab Sample IDs: 1906143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	98.2	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A77132

Included Lab Sample IDs: 1906144

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A77139

Included Lab Sample IDs: 1906144

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A77167

Included Lab Sample IDs: 1906144

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A77172

Included Lab Sample IDs: 1906143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.2	96.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A77183

Included Lab Sample IDs: 1906143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	102	P/P	90 - 110
Sulfate	99.3	109	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A77202

Included Lab Sample IDs: 1906144

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A77288

Included Lab Sample IDs: 1906143

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

Reference Method: SM 5310 B-00

Run ID: A77311

Included Lab Sample IDs: 1906144

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.6	94.3	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				2.93	
EPA 300.0 Rev. 2.1	Chloride	101	99.2 104		0.157	
	Sulfate	99.5	95.6 103		0.556	
EPA 350.1 Rev. 2.0	Ammonia-N	103	98.2 98.5			0.248
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	91.9 90.4			0.828
EPA 353.2 Rev. 2.0	NO2NO3-N	104	106 105			0.308
EPA 365.1 Rev. 2.0	Total-P	102	98.7 100			1.26
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	97.8 95.9			1.96
SM 2120 B	Color (true)				2.38	
SM 2320 B-97	Total Alkalinity	104			0.178	
SM 2540 C-97	TDS				3.76	
SM 4500 F-C-97	Fluoride	99.4	94.5 97.9			3.04
SM 5310 B-00	Organic Carbon	94.2	93.7 95.5			1.38

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1906143
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1906143
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1906143
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1906144
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1906144
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1906144
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1906144
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1906145
SM 2120 B / E31780	True Color measured at 450 nm	1906143
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1906143
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1906143
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1906143
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1906143
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1906144

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	06/14/2017			06/14/2017 16:01	Sima Feizi	1906143
EPA 300.0 Rev. 2.1	06/14/2017			06/20/2017	Julia Storbeck	1906143
EPA 350.1 Rev. 2.0	06/14/2017			06/15/2017	Sofia Elnemr	1906144
EPA 351.2 Rev. 2.0	06/14/2017	06/15/2017	Adrian Shelby	06/20/2017	Joseph Suarez	1906144
EPA 353.2 Rev. 2.0	06/14/2017			06/16/2017	Beverly Y. Sanders	1906144
EPA 365.1 Rev. 2.0	06/14/2017	06/16/2017	Vijayalakshmi Reddy	06/19/2017	Lipi Saha	1906144
EPA 365.1 Rev. 2.0 dissolved	06/14/2017			06/14/2017 14:20	Lipi Saha	1906145
SM 2120 B	06/14/2017			06/14/2017 16:54	Tanya Welborn	1906143
SM 2320 B-97	06/14/2017			06/22/2017	Dale L. Simmons	1906143
SM 2540 C-97	06/14/2017			06/16/2017	Yijie Li	1906143
SM 2540 D-97	06/14/2017			06/16/2017	Yijie Li	1906143
SM 4500 F-C-97	06/14/2017			06/17/2017	Elisa J Lutz	1906143
SM 5310 B-00	06/14/2017			06/22/2017	Ping Hua	1906144