

Chemical Analysis Report

CEN-DIST-2021-10-19-01

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

Event Description: **Tiger Lake + Packingham Slough**
Request ID: **RQ-2021-10-18-28**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 12-NOV-2021 15:00

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, slightly 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 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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Tiger Lake near Center

Collection Date/Time: 10/18/2021 12:14

Field ID: G4CE0206

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2284412	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P405259	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P405449	
		Sulfate	10		mg SO4/L	P405451	
	SM 2120 B-2011	Color (true)	41		PCU	P405264	
	SM 2320 B-2011	Total Alkalinity	35		mg CaCO3/L	P405391	
	SM 2540 C-2011	TDS	119		mg/L	P405954	
	SM 2540 D-2011	TSS	26		mg/L	P405876	
	SM 4500 F-C-2011	Fluoride	0.097	I	mg F/L	P405394	
2284413	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P405590	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P405565	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405463	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P405429	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P405620	
2284414	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P405269	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405259

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405590

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405565

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405463

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405429

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405269

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

Reference Method: SM 2120 B-2011
Batch ID: P405264

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P405391

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

Reference Method: SM 2540 C-2011
Batch ID: P405954

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P405876

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P405394

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P405620

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: P405449

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P405451

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P405590

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P405565

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P405463

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P405429

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: P405269

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.0		P	90 - 110

Reference Method: SM 2120 B-2011
 Batch ID: P405264

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
 Batch ID: P405391

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	94 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P405394

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P405620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284064	Chloride	103		P	90 - 110
2284350	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284064	Sulfate	103		P	90 - 110
2284350	Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284465	Ammonia-N	97.4	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284351	NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284490	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405269

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284468	O-Phosphate-P	94.6	94.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P405394

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284463	Fluoride	103	102	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P405620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284221	Organic Carbon	98.9	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284444	Turbidity	1.87	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284064	Chloride	0.801	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284064	Sulfate	0.373	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284465	Ammonia-N	1.33	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284413	Kjeldahl Nitrogen	0.160	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284351	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284490	Total-P	1.46	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284468	O-Phosphate-P	0.106	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P405264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284283	Color (true)	4.87	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P405391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284463	Total Alkalinity	3.22	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P405954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284463	TDS	3.15	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P405394

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284463	Fluoride	0.473	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P405620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284221	Organic Carbon	0.212	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108414

Included Lab Sample IDs: 2284412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A108415

Included Lab Sample IDs: 2284412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108416

Included Lab Sample IDs: 2284414

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	99.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A108426

Included Lab Sample IDs: 2284412

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

Reference Method: SM 2320 B-2011

Run ID: A108464

Included Lab Sample IDs: 2284412

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

Reference Method: SM 4500 F-C-2011

Run ID: A108464

Included Lab Sample IDs: 2284412

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108483

Included Lab Sample IDs: 2284413

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108497

Included Lab Sample IDs: 2284413

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108537

Included Lab Sample IDs: 2284413

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.3	96.9	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A108545

Included Lab Sample IDs: 2284413

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108563

Included Lab Sample IDs: 2284413

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	98.4	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		Precision	
					LCS	MS
EPA 180.1 Rev. 2.0	Turbidity				1.87	
EPA 300.0 Rev. 2.1	Chloride	101	103	100	0.801	
	Sulfate	101	103	99.7	0.373	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	97.4	96.0		1.33
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.3				0.160
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.5	99.0		0.504
EPA 365.1 Rev. 2.0	Total-P	102	105	107		1.46
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	94.6	94.7		0.106
SM 2120 B-2011	Color (true)	100			4.87	
SM 2320 B-2011	Total Alkalinity	99.5			3.22	
SM 2540 C-2011	TDS				3.15	
SM 4500 F-C-2011	Fluoride	102	103	102		0.473
SM 5310 B-2011	Organic Carbon	96.2	98.9	99.2		0.212

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2284412
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2284412
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2284412
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2284413
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2284413
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2284413
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2284413
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2284414
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2284412
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2284412
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2284412
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2284412
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2284412
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2284413

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	10/19/2021			10/19/2021 16:16	Khloe J Berg	2284412
EPA 300.0 Rev. 2.1	10/19/2021			10/21/2021 15:35	Lipi Saha	2284412
EPA 350.1 Rev. 2.0	10/19/2021			10/26/2021 13:46	Ping Hua	2284413
EPA 351.2 Rev. 2.0	10/19/2021	10/26/2021 08:29	Benjamin T. Nordmann	10/27/2021 10:48	Alexandra J Mattheus	2284413
EPA 353.2 Rev. 2.0	10/19/2021			10/22/2021 10:54	Beverly Y. Sanders	2284413
EPA 365.1 Rev. 2.0	10/19/2021	10/21/2021 17:16	Simonne.V. Calhoun	10/22/2021 12:46	Sarah A Nixon	2284413
EPA 365.1 Rev. 2.0 dissolved	10/19/2021			10/19/2021 17:25	James L Waggerby	2284414
SM 2120 B-2011	10/19/2021			10/19/2021 16:58	Benjamin T. Nordmann	2284412
SM 2320 B-2011	10/19/2021			10/21/2021 01:31	Dale L. Simmons	2284412
SM 2540 C-2011	10/19/2021			10/22/2021 15:35	Yijie Li	2284412
SM 2540 D-2011	10/19/2021			10/22/2021 15:35	Yijie Li	2284412
SM 4500 F-C-2011	10/19/2021			10/21/2021 01:31	Dale L. Simmons	2284412
SM 5310 B-2011	10/19/2021			10/26/2021 03:10	Khloe J Berg	2284413