

Chemical Analysis Report

CEN-DIST-2023-08-08-01

Florida DEP Laboratory
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Tallahassee, FL 32399-2400
DOH Accreditation E31780

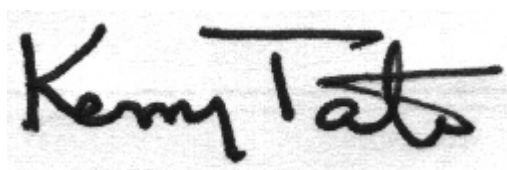
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-07-03-50**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

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

Date Certified: 21-AUG-2023 08:47

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the 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: 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 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: Pioneer Lake - N Shore

Collection Date/Time: 08/07/2023 11:32

Field ID: HABCE0206

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2429122	DEP SOP: NU-094-1	Color (true)	24	A	PCU	P433584	
2429123	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P433779	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77	J	mg N/L	P433592	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.47		mg N/L	P433684	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P433603	
2429124	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P433577	
2429125	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433539	
		Cylindrospermopsin	0.10	U	ug/L	P433537	
		Desmethyl microcystin LR	0.25	U	ug/L	P433537	
		Microcystin HILR	0.25	U	ug/L	P433537	
		Microcystin HtyR	0.25	U	ug/L	P433537	
		Microcystin LA	0.40		ug/L	P433537	
		Microcystin LF	0.10	U	ug/L	P433537	
		Microcystin LR	0.25	U	ug/L	P433537	
		Microcystin LW	0.25	U	ug/L	P433537	
		Microcystin LY	0.10	U	ug/L	P433537	
		Microcystin RR	0.10	U	ug/L	P433537	
		Microcystin WR	0.50	U	ug/L	P433537	
		Neosaxitoxin	0.50	U	ug/L	P433539	
		Microcystin YR	0.25	U	ug/L	P433537	
		Saxitoxin	0.50	U	ug/L	P433539	
		Nodularin-R	0.10	U	ug/L	P433537	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P433584

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433779

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433592

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433684

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433603

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433577

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

Reference Method: EPA 8321B
Batch ID: P433537

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P433539

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P433584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433779

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433592

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433603

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: P433577

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

Reference Method: EPA 8321B
Batch ID: P433537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	99.4		P	40 - 160
Desmethyl microcystin LR	111		P	40 - 160
Microcystin H11R	113		P	40 - 160
Microcystin HtyR	104		P	40 - 160
Microcystin LA	113		P	40 - 160
Microcystin LF	96.1		P	40 - 160
Microcystin LR	105		P	40 - 160
Microcystin LW	104		P	40 - 160
Microcystin LY	115		P	40 - 160
Microcystin RR	101		P	40 - 160
Microcystin WR	119		P	40 - 160
Microcystin YR	97.2		P	40 - 160
Nodularin-R	105		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433539

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 150
Neosaxitoxin	96.4		P	40 - 150
Saxitoxin	104		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433779

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429262	Ammonia-N	97.0	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433592

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429123	Kjeldahl Nitrogen	88.5	96.6	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429077	NO2NO3-N	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433603

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429078	Total-P	102	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429079	O-Phosphate-P	97.6	97.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429047	Cylindrospermopsin	108	105	P/P	40 - 160
2429047	Desmethyl microcystin LR	126	122	P/P	40 - 160
2429047	Microcystin HiLR	126	122	P/P	40 - 160
2429047	Microcystin HtyR	114	112	P/P	40 - 160
2429047	Microcystin LA	125	119	P/P	40 - 160
2429047	Microcystin LF	114	113	P/P	40 - 160
2429047	Microcystin LR	124	120	P/P	40 - 160
2429047	Microcystin LW	120	116	P/P	40 - 160
2429047	Microcystin LY	118	117	P/P	40 - 160
2429047	Microcystin RR	109	112	P/P	40 - 160
2429047	Microcystin WR	129	127	P/P	40 - 160
2429047	Microcystin YR	110	105	P/P	40 - 160
2429047	Nodularin-R	116	114	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433539

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2429047	Anatoxin-a	89.8	89.8	P/P	40 - 150
2429047	Neosaxitoxin	53.9	52.0	P/P	40 - 150
2429047	Saxitoxin	50.8	49.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P433584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429122	Color (true)	0.585	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429262	Ammonia-N	0.369	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433592

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429123	Kjeldahl Nitrogen	5.98	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429077	NO2NO3-N	0.468	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429078	Total-P	1.82	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429079	O-Phosphate-P	0.205	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429047	Cylindrospermopsin	3.11	Spike	P	0 - 30
2429047	Desmethyl microcystin LR	3.47	Spike	P	0 - 30
2429047	Microcystin HtIR	3.18	Spike	P	0 - 30
2429047	Microcystin HtyR	1.86	Spike	P	0 - 30
2429047	Microcystin LA	4.97	Spike	P	0 - 30
2429047	Microcystin LF	0.316	Spike	P	0 - 30
2429047	Microcystin LR	3.16	Spike	P	0 - 30
2429047	Microcystin LW	3.33	Spike	P	0 - 30
2429047	Microcystin LY	0.835	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P433537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429047	Microcystin RR	2.31	Spike	P	0 - 30
2429047	Microcystin WR	1.23	Spike	P	0 - 30
2429047	Microcystin YR	5.04	Spike	P	0 - 30
2429047	Nodularin-R	1.92	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433539

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429047	Anatoxin-a	0.0467	Spike	P	0 - 30
2429047	Neosaxitoxin	3.60	Spike	P	0 - 30
2429047	Saxitoxin	2.60	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2429125
Field Sample ID: HABCE0206

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	99.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	99.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120898

Included Lab Sample IDs: 2429124

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.5	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A120900

Included Lab Sample IDs: 2429122

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	97.6	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120933

Included Lab Sample IDs: 2429125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	103	102	P/P	60 - 160
Desmethyl microcystin LR	106	103	P/P	50 - 160
Microcystin HiiR	111	107	P/P	60 - 160
Microcystin HtyR	100	94.2	P/P	60 - 160
Microcystin LA	109	111	P/P	50 - 160
Microcystin LF	97.0	89.5	P/P	60 - 160
Microcystin LR	102	97.6	P/P	60 - 160
Microcystin LW	97.9	82.1	P/P	60 - 160
Microcystin LY	101	97.8	P/P	60 - 160
Microcystin RR	99.8	97.4	P/P	60 - 160
Microcystin WR	112	111	P/P	60 - 160
Microcystin YR	91.5	84.8	P/P	60 - 160
Nodularin-R	98.9	96.2	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A120937

Included Lab Sample IDs: 2429125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	96.6	P/P	50 - 160
Neosaxitoxin	89.3	86.7	P/P	50 - 160
Saxitoxin	83.1	81.3	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120956

Included Lab Sample IDs: 2429123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120962

Included Lab Sample IDs: 2429123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	97.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120988

Included Lab Sample IDs: 2429123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120998

Included Lab Sample IDs: 2429123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	98.9	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	MS
						SMP	
DEP SOP: NU-094-1	Color (true)	97.3				0.585	
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	97.0	96.6			0.369
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	88.5	96.6			5.98
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	107	106			0.468
EPA 365.1 Rev. 2.0	Total-P	97.8	102	99.9			1.82
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.6	97.4			0.205
EPA 8321B	Anatoxin-a	108	89.8	89.8			0.0467
	Cylindrospermopsin	99.4	108	105			3.11
	Desmethyl microcystin LR	111	126	122			3.47
	Microcystin H ₁ LR	113	126	122			3.18
	Microcystin H ₂ LR	104	114	112			1.86
	Microcystin LA	113	125	119			4.97
	Microcystin LF	96.1	114	113			0.316
	Microcystin LR	105	124	120			3.16
	Microcystin LW	104	120	116			3.33
	Microcystin LY	115	118	117			0.835
	Microcystin RR	101	109	112			2.31
	Microcystin WR	119	129	127			1.23
	Microcystin YR	97.2	110	105			5.04
	Neosaxitoxin	96.4	53.9	52.0			3.60
	Nodularin-R	105	116	114			1.92
	Saxitoxin	104	50.8	49.5			2.60

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2429122
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2429123
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2429123
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2429123
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2429123
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2429124
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2429125
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2429125

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	08/08/2023			08/08/2023 15:14	Anna M. Plaviak	2429122
EPA 350.1 Rev. 2.0	08/08/2023			08/11/2023 15:26	Ping Hua	2429123
EPA 351.2 Rev. 2.0	08/08/2023	08/09/2023 12:44	Simonne.V. Calhoun	08/11/2023 10:15	Samantha L Bates	2429123
EPA 353.2 Rev. 2.0	08/08/2023			08/10/2023 10:00	Beverly Y. Sanders	2429123
EPA 365.1 Rev. 2.0	08/08/2023	08/09/2023 14:50	Simonne.V. Calhoun	08/10/2023 11:11	Simonne.V. Calhoun	2429123
EPA 365.1 Rev. 2.0 dissolved	08/08/2023			08/08/2023 15:26	Elise M. Gillis	2429124
EPA 8321B	08/08/2023	08/09/2023 12:00	Hana Lee	08/09/2023 17:50	Tae K Lee	2429125
	08/08/2023	08/09/2023 12:00	Hana Lee	08/09/2023 18:09	Tae K Lee	2429125