

Chemical Analysis Report

WQAP-2023-07-26-01

Florida DEP Laboratory
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DOH Accreditation E31780

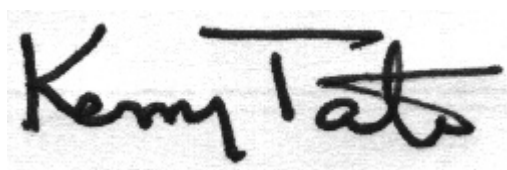
Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2023-06-26-51**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 04-AUG-2023 10:23

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: Lake Manatee

Collection Date/Time: 07/25/2023 12:55

Field ID: HAB-SW-0217

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2426618	DEP SOP: NU-094-1	Color (true)	40		PCU	P433045	
2426619	EPA 350.1 Rev. 2.0	Ammonia-N	0.087		mg N/L	P433105	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P433101	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P433111	
	EPA 365.1 Rev. 2.0	Total-P	0.33		mg P/L	P433069	
2426620	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P433054	
2426626	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433039	
		Cylindrospermopsin	0.10	U	ug/L	P433017	
		Desmethyl microcystin LR	0.25	U	ug/L	P433017	
		Microcystin HiLR	0.25	U	ug/L	P433017	
		Microcystin HtyR	0.25	U	ug/L	P433017	
		Microcystin LA	0.10	U	ug/L	P433017	
		Microcystin LF	0.10	U	ug/L	P433017	
		Microcystin LR	0.25	U	ug/L	P433017	
		Microcystin LW	0.25	U	ug/L	P433017	
		Microcystin LY	0.10	U	ug/L	P433017	
		Microcystin RR	0.10	U	ug/L	P433017	
		Microcystin WR	0.50	U	ug/L	P433017	
		Neosaxitoxin	0.50	U	ug/L	P433039	
		Microcystin YR	0.25	U	ug/L	P433017	
		Saxitoxin	0.50	U	ug/L	P433039	
		Nodularin-R	0.10	U	ug/L	P433017	

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P433045

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433101

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433111

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433069

Component	Result	Code	Units
Total-P	0.010	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433054

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

Reference Method: EPA 8321B
Batch ID: P433017

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: P433039

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: P433045

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433101

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433111

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433069

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433054

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

Reference Method: EPA 8321B
Batch ID: P433017

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	100		P	40 - 160
Desmethyl microcystin LR	105		P	40 - 160
Microcystin H1LR	102		P	40 - 160
Microcystin HtyR	90.2		P	40 - 160
Microcystin LA	105		P	40 - 160
Microcystin LF	89.7		P	40 - 160
Microcystin LR	95.5		P	40 - 160
Microcystin LW	91.3		P	40 - 160
Microcystin LY	100		P	40 - 160
Microcystin RR	93.7		P	40 - 160
Microcystin WR	104		P	40 - 160
Microcystin YR	87.6		P	40 - 160
Nodularin-R	91.5		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433039

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	115		P	40 - 150
Neosaxitoxin	101		P	40 - 150
Saxitoxin	90.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425792	Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426738	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426619	NO2NO3-N	99.0	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426689	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433054

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426537	O-Phosphate-P	98.5	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433017

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426599	Cylindrospermopsin	91.7	92.2	P/P	40 - 160
2426599	Desmethyl microcystin LR	104	98.9	P/P	40 - 160
2426599	Microcystin HiLR	96.0	97.0	P/P	40 - 160
2426599	Microcystin HtyR	85.2	86.5	P/P	40 - 160
2426599	Microcystin LA	95.4	95.2	P/P	40 - 160
2426599	Microcystin LF	93.2	90.4	P/P	40 - 160
2426599	Microcystin LR	94.0	94.4	P/P	40 - 160
2426599	Microcystin LW	85.3	86.4	P/P	40 - 160
2426599	Microcystin LY	90.1	95.2	P/P	40 - 160
2426599	Microcystin RR	85.4	87.1	P/P	40 - 160
2426599	Microcystin WR	92.2	94.1	P/P	40 - 160
2426599	Microcystin YR	81.7	79.0	P/P	40 - 160
2426599	Nodularin-R	85.2	88.0	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2426599	Anatoxin-a	106	110	P/P	40 - 150
2426599	Neosaxitoxin	70.1	75.7	P/P	40 - 150
2426599	Saxitoxin	77.1	76.6	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P433045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426693	Color (true)	0.147	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425792	Ammonia-N	2.29	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426738	Kjeldahl Nitrogen	0.0955	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426619	NO2NO3-N	3.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426689	Total-P	0.363	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433054

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426537	O-Phosphate-P	0.713	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426599	Cylindrospermopsin	0.545	Spike	P	0 - 30
2426599	Desmethyl microcystin LR	4.64	Spike	P	0 - 30
2426599	Microcystin HtIR	1.06	Spike	P	0 - 30
2426599	Microcystin HtyR	1.54	Spike	P	0 - 30
2426599	Microcystin LA	0.191	Spike	P	0 - 30
2426599	Microcystin LF	3.12	Spike	P	0 - 30
2426599	Microcystin LR	0.468	Spike	P	0 - 30
2426599	Microcystin LW	1.33	Spike	P	0 - 30
2426599	Microcystin LY	5.50	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P433017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426599	Microcystin RR	2.06	Spike	P	0 - 30
2426599	Microcystin WR	2.06	Spike	P	0 - 30
2426599	Microcystin YR	3.45	Spike	P	0 - 30
2426599	Nodularin-R	3.25	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2426599	Anatoxin-a	2.99	Spike	P	0 - 30
2426599	Neosaxitoxin	7.70	Spike	P	0 - 30
2426599	Saxitoxin	0.651	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2426626
Field Sample ID: HAB-SW-0217

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	109	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	80.4	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A120651

Included Lab Sample IDs: 2426618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.8	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120654

Included Lab Sample IDs: 2426620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	98.6	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120661

Included Lab Sample IDs: 2426626

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	94.9	96.0	P/P	60 - 160
Desmethyl microcystin LR	98.6	97.7	P/P	50 - 160
Microcystin HII R	95.6	94.3	P/P	60 - 160
Microcystin HtyR	83.8	81.0	P/P	60 - 160
Microcystin LA	97.6	99.2	P/P	50 - 160
Microcystin LF	77.9	77.2	P/P	60 - 160
Microcystin LR	94.4	84.2	P/P	60 - 160
Microcystin LW	76.9	75.9	P/P	60 - 160
Microcystin LY	93.0	89.8	P/P	60 - 160
Microcystin RR	85.5	82.0	P/P	60 - 160
Microcystin WR	89.8	91.8	P/P	60 - 160
Microcystin YR	76.7	76.5	P/P	60 - 160
Nodularin-R	84.4	84.5	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A120662

Included Lab Sample IDs: 2426626

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	116	116	P/P	50 - 160
Neosaxitoxin	104	103	P/P	50 - 160
Saxitoxin	90.9	88.5	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120681

Included Lab Sample IDs: 2426619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120682

Included Lab Sample IDs: 2426619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	100	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120700

Included Lab Sample IDs: 2426619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120746

Included Lab Sample IDs: 2426619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	93.4	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	MS
					SMP	
DEP SOP: NU-094-1	Color (true)	97.1			0.147	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.8	101		2.29
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	105	104		0.0955
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.0	94.0		3.20
EPA 365.1 Rev. 2.0	Total-P	103	106	105		0.363
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	98.5	97.8		0.713
EPA 8321B	Anatoxin-a	115	106	110		2.99
	Cylindrospermopsin	100	91.7	92.2		0.545
	Desmethyl microcystin LR	105	104	98.9		4.64
	Microcystin H1LR	102	96.0	97.0		1.06
	Microcystin HtyR	90.2	85.2	86.5		1.54
	Microcystin LA	105	95.4	95.2		0.191
	Microcystin LF	89.7	93.2	90.4		3.12
	Microcystin LR	95.5	94.0	94.4		0.468
	Microcystin LW	91.3	85.3	86.4		1.33
	Microcystin LY	100	90.1	95.2		5.50
	Microcystin RR	93.7	85.4	87.1		2.06
	Microcystin WR	104	92.2	94.1		2.06
	Microcystin YR	87.6	81.7	79.0		3.45
	Neosaxitoxin	101	70.1	75.7		7.70
	Nodularin-R	91.5	85.2	88.0		3.25
	Saxitoxin	90.1	77.1	76.6		0.651

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2426618
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2426619
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2426619
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2426619
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2426619
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2426620
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2426626
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2426626

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	07/26/2023			07/26/2023 14:00	Samantha L Bates	2426618
EPA 350.1 Rev. 2.0	07/26/2023			07/27/2023 11:46	Ping Hua	2426619
EPA 351.2 Rev. 2.0	07/26/2023	07/27/2023 12:39	Dana G. Hughes	07/31/2023 16:08	Samantha L Bates	2426619
EPA 353.2 Rev. 2.0	07/26/2023			07/27/2023 11:33	Beverly Y. Sanders	2426619
EPA 365.1 Rev. 2.0	07/26/2023	07/27/2023 14:45	Simonne.V. Calhoun	07/28/2023 09:54	Chandler E Cox	2426619
EPA 365.1 Rev. 2.0 dissolved	07/26/2023			07/26/2023 14:38	Chandler E Cox	2426620
EPA 8321B	07/26/2023	07/26/2023 13:00	Hana Lee	07/26/2023 17:26	Tae K Lee	2426626
	07/26/2023	07/26/2023 13:00	Hana Lee	07/27/2023 02:29	Tae K Lee	2426626