Chemical Analysis Report

SO-DIST-2023-08-10-04

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

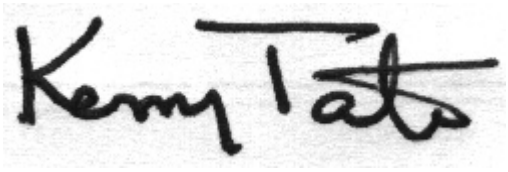
Event Description: **Algal Bloom Response -SOROC w/ blank**
Request ID: **RQ-2023-07-17-61**
Customer: **SO-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: John Barrington

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 29-AUG-2023 09:44



NON-CONFORMANCE REPORT INCLUDED

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: Caloosahatchee River- Fort Myers Shores **Collection Date/Time: 08/08/2023 09:30**

Field ID: HAB-SD-080823-0930 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2430493	EPA 8321B	Anatoxin-a	0.25	UY	ug/L	P433726	
		Cylindrospermopsin	0.10	UY	ug/L	P433725	
		Desmethyl microcystin LR	0.25	UY	ug/L	P433725	
		Microcystin HilR	0.25	UY	ug/L	P433725	
		Microcystin HtyR	0.25	UY	ug/L	P433725	
		Microcystin LA	0.10	UY	ug/L	P433725	
		Microcystin LF	0.10	UY	ug/L	P433725	
		Microcystin LR	0.25	UY	ug/L	P433725	
		Microcystin LW	0.25	UY	ug/L	P433725	
		Microcystin LY	0.10	UY	ug/L	P433725	
		Microcystin RR	0.10	UY	ug/L	P433725	
		Microcystin WR	0.50	UY	ug/L	P433725	
		Neosaxitoxin	0.50	UY	ug/L	P433726	
		Microcystin YR	0.25	UY	ug/L	P433725	
		Saxitoxin	0.50	UY	ug/L	P433726	
		Nodularin-R	0.10	UY	ug/L	P433725	
2430494	EPA 350.1 Rev. 2.0	Ammonia-N	0.052	Y	mg N/L	P434128	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4	Y	mg N/L	P433818	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18	Y	mg N/L	P434401	
	EPA 365.1 Rev. 2.0	Total-P	0.19	Y	mg P/L	P433844	
2430495	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12	YQ	mg P/L	P433764	

Ref. Method and Comment:
EPA 8321B: Y - Sample was received with inadequate sample preservation; see NCR report.
EPA 350.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.
EPA 351.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.
EPA 353.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.
EPA 365.1 Rev. 2.0: Total-P: Sample received outside of the acceptable temperature range. Please see NCR.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt. Sample received outside of the acceptable temperature range. Please see NCR.

Non-Conformance Report

NCR ID: 10029

Event(s)	Job(s)	Sample(s)	Test(s)
SO-DIST-2023-08-10-04			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: Samples arrived late, samples received outside the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.
The algae were not degraded and were able to be analyzed. The result will not be qualified.- AGR

Authorized by/Date: Kyle Klug 8/14/2023

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434128

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433818

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434401

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433844

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433764

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

Reference Method: EPA 8321B
Batch ID: P433725

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	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

Reference Method: EPA 8321B
Batch ID: P433726

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: EPA 350.1 Rev. 2.0
Batch ID: P434128

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433818

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434401

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: P433844

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: P433764

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

Reference Method: EPA 8321B
Batch ID: P433725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	114		P	40 - 160
Desmethyl microcystin LR	118		P	40 - 160
Microcystin HilR	117		P	40 - 160
Microcystin HtyR	110		P	40 - 160
Microcystin LA	127		P	40 - 160
Microcystin LF	113		P	40 - 160
Microcystin LR	116		P	40 - 160
Microcystin LW	119		P	40 - 160
Microcystin LY	123		P	40 - 160
Microcystin RR	103		P	40 - 160
Microcystin WR	127		P	40 - 160
Microcystin YR	108		P	40 - 160
Nodularin-R	111		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433726

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	89.7		P	40 - 150
Neosaxitoxin	79.1		P	40 - 150
Saxitoxin	66.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434128

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430379	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433818

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430550	Kjeldahl Nitrogen	103	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430465	NO2NO3-N	97.8	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430465	Total-P	102	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430466	O-Phosphate-P	103	103	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430467	Cylindrospermopsin	112	115	P/P	40 - 160
2430467	Desmethyl microcystin LR	119	117	P/P	40 - 160
2430467	Microcystin HilR	120	120	P/P	40 - 160
2430467	Microcystin HtyR	107	110	P/P	40 - 160
2430467	Microcystin LA	120	115	P/P	40 - 160
2430467	Microcystin LF	114	116	P/P	40 - 160
2430467	Microcystin LR	113	115	P/P	40 - 160
2430467	Microcystin LW	122	118	P/P	40 - 160
2430467	Microcystin LY	116	111	P/P	40 - 160
2430467	Microcystin RR	102	105	P/P	40 - 160
2430467	Microcystin WR	128	127	P/P	40 - 160
2430467	Microcystin YR	108	105	P/P	40 - 160
2430467	Nodularin-R	110	112	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433726

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430467	Anatoxin-a	87.5	90.8	P/P	40 - 150
2430467	Neosaxitoxin	58.1	58.0	P/P	40 - 150
2430467	Saxitoxin	53.5	54.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434128

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430379	Ammonia-N	0.158	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433818

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430550	Kjeldahl Nitrogen	4.49	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430465	NO2NO3-N	1.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430465	Total-P	3.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430466	O-Phosphate-P	0.275	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430467	Cylindrospermopsin	2.86	Spike	P	0 - 30
2430467	Desmethyl microcystin LR	2.12	Spike	P	0 - 30
2430467	Microcystin HilR	0.160	Spike	P	0 - 30
2430467	Microcystin HtyR	3.31	Spike	P	0 - 30
2430467	Microcystin LA	3.85	Spike	P	0 - 30
2430467	Microcystin LF	1.59	Spike	P	0 - 30
2430467	Microcystin LR	1.51	Spike	P	0 - 30
2430467	Microcystin LW	3.28	Spike	P	0 - 30
2430467	Microcystin LY	3.67	Spike	P	0 - 30
2430467	Microcystin RR	1.97	Spike	P	0 - 30
2430467	Microcystin WR	0.770	Spike	P	0 - 30
2430467	Microcystin YR	2.65	Spike	P	0 - 30
2430467	Nodularin-R	1.82	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P433726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430467	Anatoxin-a	3.70	Spike	P	0 - 30
2430467	Neosaxitoxin	0.0544	Spike	P	0 - 30
2430467	Saxitoxin	1.03	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2430493
Field Sample ID: HAB-SD-080823-0930

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	81.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	93.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A120990
Included Lab Sample IDs: 2430495

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

Reference Method: EPA 8321B
Run ID: A120991
Included Lab Sample IDs: 2430493

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	111	107	P/P	60 - 160
Desmethyl microcystin LR	107	101	P/P	50 - 160
Microcystin HilR	114	105	P/P	60 - 160
Microcystin HtyR	104	92.1	P/P	60 - 160
Microcystin LA	113	110	P/P	50 - 160
Microcystin LF	91.1	78.2	P/P	60 - 160
Microcystin LR	110	99.3	P/P	60 - 160
Microcystin LW	96.5	85.2	P/P	60 - 160
Microcystin LY	111	103	P/P	60 - 160
Microcystin RR	103	92.3	P/P	60 - 160
Microcystin WR	109	108	P/P	60 - 160
Microcystin YR	104	89.5	P/P	60 - 160
Nodularin-R	106	96.7	P/P	60 - 160

Reference Method: EPA 8321B
Run ID: A121015
Included Lab Sample IDs: 2430493

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	96.1	P/P	50 - 160
Neosaxitoxin	86.4	82.0	P/P	50 - 160
Saxitoxin	73.1	71.9	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121032
Included Lab Sample IDs: 2430494

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A121052
Included Lab Sample IDs: 2430494

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121154
Included Lab Sample IDs: 2430494

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A121266
Included Lab Sample IDs: 2430494

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	98.0	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	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	100	101	102			0.158
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	103	109			4.49
EPA 353.2 Rev. 2.0	NO2NO3-N	100	97.8	99.8			1.69
EPA 365.1 Rev. 2.0	Total-P	103	102	106			3.23
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	103	103			0.275
EPA 8321B	Anatoxin-a	89.7	87.5	90.8			3.70
	Cylindrospermopsin	114	112	115			2.86
	Desmethyl microcystin LR	118	119	117			2.12
	Microcystin HilR	117	120	120			0.160
	Microcystin HtyR	110	107	110			3.31
	Microcystin LA	127	120	115			3.85
	Microcystin LF	113	114	116			1.59
	Microcystin LR	116	113	115			1.51
	Microcystin LW	119	122	118			3.28
	Microcystin LY	123	116	111			3.67
	Microcystin RR	103	102	105			1.97
	Microcystin WR	127	128	127			0.770
	Microcystin YR	108	108	105			2.65
	Neosaxitoxin	79.1	58.1	58.0			0.0544
	Nodularin-R	111	110	112			1.82
	Saxitoxin	66.1	53.5	54.0			1.03

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2430494
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2430494
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2430494
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2430494
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2430495
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2430493
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2430493

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	08/10/2023			08/21/2023 13:49	Khloe J Berg	2430494
EPA 351.2 Rev. 2.0	08/10/2023	08/14/2023 13:41	Ping Hua	08/15/2023 17:07	Ping Hua	2430494
EPA 353.2 Rev. 2.0	08/10/2023			08/25/2023 14:23	Anna M. Plaviak	2430494
EPA 365.1 Rev. 2.0	08/10/2023	08/14/2023 15:42	Adam P Silver	08/15/2023 09:38	James L Waggerby	2430494
EPA 365.1 Rev. 2.0 dissolved	08/10/2023			08/11/2023 13:33	Adam P Silver	2430495
EPA 8321B	08/10/2023	08/11/2023 10:30	Hana Lee	08/11/2023 13:03	Tae K Lee	2430493
	08/10/2023	08/11/2023 14:00	Hana Lee	08/14/2023 11:25	Tae K Lee	2430493