Chemical Analysis Report

WQAP-2023-07-27-02

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

Event Description: **Algae Bloom Response NEROC-as needed**
Request ID: **RQ-2023-07-24-49**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
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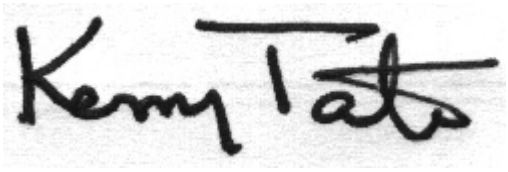
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 08-AUG-2023 07:04



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: Cedar River-end if Marcus Pt E **Collection Date/Time: 07/26/2023 09:40**

Field ID: NEHAB0109 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2427347	DEP SOP: NU-094-1	Color (true)	46		PCU	P433137	
2427348	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P433445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P433221	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P433169	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P433211	
2427349	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P433118	
2427350	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433141	
		Cylindrospermopsin	0.10	U	ug/L	P433140	
		Desmethyl microcystin LR	0.25	U	ug/L	P433140	
		Microcystin HilR	0.25	U	ug/L	P433140	
		Microcystin HtyR	0.25	U	ug/L	P433140	
		Microcystin LA	0.10	U	ug/L	P433140	
		Microcystin LF	0.10	U	ug/L	P433140	
		Microcystin LR	0.25	U	ug/L	P433140	
		Microcystin LW	0.25	U	ug/L	P433140	
		Microcystin LY	0.10	U	ug/L	P433140	
		Microcystin RR	0.10	U	ug/L	P433140	
		Microcystin WR	0.50	U	ug/L	P433140	
		Neosaxitoxin	0.50	U	ug/L	P433141	
		Microcystin YR	0.25	U	ug/L	P433140	
		Saxitoxin	0.50	U	ug/L	P433141	
		Nodularin-R	0.10	U	ug/L	P433140	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P433137

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433221

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433169

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433211

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

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

Reference Method: EPA 8321B
Batch ID: P433140

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P433141

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: P433137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433221

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	92.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433211

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

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

Reference Method: EPA 8321B
Batch ID: P433140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	102		P	40 - 160
Desmethyl microcystin LR	104		P	40 - 160
Microcystin HilR	103		P	40 - 160
Microcystin HtyR	97.0		P	40 - 160
Microcystin LA	121		P	40 - 160
Microcystin LF	103		P	40 - 160
Microcystin LR	104		P	40 - 160
Microcystin LW	102		P	40 - 160
Microcystin LY	114		P	40 - 160
Microcystin RR	103		P	40 - 160
Microcystin WR	107		P	40 - 160
Microcystin YR	92.0		P	40 - 160
Nodularin-R	103		P	40 - 160

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	111		P	40 - 150
Neosaxitoxin	94.9		P	40 - 150
Saxitoxin	85.5		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427257	Ammonia-N	99.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433221

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427348	Kjeldahl Nitrogen	99.1	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427348	NO2NO3-N	91.5	91.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427348	Total-P	105	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427020	O-Phosphate-P	97.3	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427350	Cylindrospermopsin	99.4	102	P/P	40 - 160
2427350	Desmethyl microcystin LR	104	101	P/P	40 - 160
2427350	Microcystin HilR	103	110	P/P	40 - 160
2427350	Microcystin HtyR	96.6	99.1	P/P	40 - 160
2427350	Microcystin LA	119	118	P/P	40 - 160
2427350	Microcystin LF	101	107	P/P	40 - 160
2427350	Microcystin LR	105	104	P/P	40 - 160
2427350	Microcystin LW	103	108	P/P	40 - 160
2427350	Microcystin LY	110	114	P/P	40 - 160
2427350	Microcystin RR	97.7	106	P/P	40 - 160
2427350	Microcystin WR	109	113	P/P	40 - 160
2427350	Microcystin YR	94.7	98.3	P/P	40 - 160
2427350	Nodularin-R	101	104	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427350	Anatoxin-a	90.8	92.0	P/P	40 - 150
2427350	Neosaxitoxin	68.9	70.8	P/P	40 - 150
2427350	Saxitoxin	65.8	68.3	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P433137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427255	Color (true)	1.61	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427257	Ammonia-N	1.08	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427348	Kjeldahl Nitrogen	0.438	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427348	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427348	Total-P	1.68	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427020	O-Phosphate-P	2.56	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427350	Cylindrospermopsin	3.00	Spike	P	0 - 30
2427350	Desmethyl microcystin LR	3.03	Spike	P	0 - 30
2427350	Microcystin HilR	7.01	Spike	P	0 - 30
2427350	Microcystin HtyR	2.54	Spike	P	0 - 30
2427350	Microcystin LA	0.697	Spike	P	0 - 30
2427350	Microcystin LF	5.75	Spike	P	0 - 30
2427350	Microcystin LR	0.508	Spike	P	0 - 30
2427350	Microcystin LW	4.95	Spike	P	0 - 30
2427350	Microcystin LY	2.94	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P433140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427350	Microcystin RR	7.68	Spike	P	0 - 30
2427350	Microcystin WR	3.93	Spike	P	0 - 30
2427350	Microcystin YR	3.75	Spike	P	0 - 30
2427350	Nodularin-R	2.60	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427350	Anatoxin-a	1.24	Spike	P	0 - 30
2427350	Neosaxitoxin	2.69	Spike	P	0 - 30
2427350	Saxitoxin	3.73	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2427350
Field Sample ID: NEHAB0109

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	120	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	89.2	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A120685
Included Lab Sample IDs: 2427349

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	97.9	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A120689
Included Lab Sample IDs: 2427347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A120701
Included Lab Sample IDs: 2427348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	93.0	93.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A120713
Included Lab Sample IDs: 2427350

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	120	114	P/P	50 - 160
Neosaxitoxin	108	103	P/P	50 - 160
Saxitoxin	90.9	84.7	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A120715
Included Lab Sample IDs: 2427350

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	101	99.5	P/P	60 - 160
Desmethyl microcystin LR	101	99.3	P/P	50 - 160
Microcystin HilR	102	99.3	P/P	60 - 160
Microcystin HtyR	92.6	89.7	P/P	60 - 160
Microcystin LA	114	111	P/P	50 - 160
Microcystin LF	103	91.2	P/P	60 - 160
Microcystin LR	102	95.4	P/P	60 - 160
Microcystin LW	104	99.0	P/P	60 - 160
Microcystin LY	105	99.9	P/P	60 - 160
Microcystin RR	100	95.2	P/P	60 - 160
Microcystin WR	106	104	P/P	60 - 160
Microcystin YR	96.3	88.3	P/P	60 - 160
Nodularin-R	93.6	94.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A120744
Included Lab Sample IDs: 2427348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A120822
Included Lab Sample IDs: 2427348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	98.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A120846
Included Lab Sample IDs: 2427348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	98.6	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
DEP SOP: NU-094-1	Color (true)	98.8				1.61	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	99.0	100			1.08
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	99.1	99.7			0.438
EPA 353.2 Rev. 2.0	NO2NO3-N	92.5	91.5	91.5			0.0
EPA 365.1 Rev. 2.0	Total-P	105	105	108			1.68
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	97.3	101			2.56
EPA 8321B	Anatoxin-a	111	90.8	92.0			1.24
	Cylindrospermopsin	102	99.4	102			3.00
	Desmethyl microcystin LR	104	104	101			3.03
	Microcystin HilR	103	103	110			7.01
	Microcystin HtyR	97.0	96.6	99.1			2.54
	Microcystin LA	121	119	118			0.697
	Microcystin LF	103	101	107			5.75
	Microcystin LR	104	105	104			0.508
	Microcystin LW	102	103	108			4.95
	Microcystin LY	114	110	114			2.94
	Microcystin RR	103	97.7	106			7.68
	Microcystin WR	107	109	113			3.93
	Microcystin YR	92.0	94.7	98.3			3.75
	Neosaxitoxin	94.9	68.9	70.8			2.69
	Nodularin-R	103	101	104			2.60
	Saxitoxin	85.5	65.8	68.3			3.73

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2427347
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2427348
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2427348
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2427348
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2427348
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2427349
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2427350
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2427350

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	07/27/2023			07/27/2023 16:18	Alexis Price	2427347
EPA 350.1 Rev. 2.0	07/27/2023			08/04/2023 11:06	Ping Hua	2427348
EPA 351.2 Rev. 2.0	07/27/2023	07/31/2023 11:02	Dana G. Hughes	08/03/2023 10:38	Samantha L Bates	2427348
EPA 353.2 Rev. 2.0	07/27/2023			07/28/2023 11:09	Beverly Y. Sanders	2427348
EPA 365.1 Rev. 2.0	07/27/2023	07/31/2023 10:30	Alexis Price	07/31/2023 15:24	Chandler E Cox	2427348
EPA 365.1 Rev. 2.0 dissolved	07/27/2023			07/27/2023 13:40	Chandler E Cox	2427349
EPA 8321B	07/27/2023	07/28/2023 12:00	Hana Lee	07/28/2023 15:21	Tae K Lee	2427350
	07/27/2023	07/28/2023 12:00	Hana Lee	07/29/2023 14:02	Juyoung Kim	2427350