

Chemical Analysis Report

CEN-DIST-2023-07-07-02

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

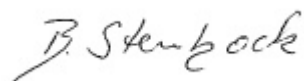
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-06-19-35**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 19-JUL-2023 15:22



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 Weir - Eatons Beach

Collection Date/Time: 07/06/2023 11:58

Field ID: HABCE0203_LakeWeir

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2421786	DEP SOP: NU-094-1	Color (true)	5.3	I	PCU	P432193	
2421787	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P432420	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P432265	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P432529	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P432232	
2421788	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P432198	
2421789	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432149	
		Cylindrospermopsin	0.10	U	ug/L	P432148	
		Desmethyl microcystin LR	0.25	U	ug/L	P432148	
		Microcystin HiLR	0.25	U	ug/L	P432148	
		Microcystin HtyR	0.25	U	ug/L	P432148	
		Microcystin LA	0.10	U	ug/L	P432148	
		Microcystin LF	0.10	U	ug/L	P432148	
		Microcystin LR	0.25	U	ug/L	P432148	
		Microcystin LW	0.25	U	ug/L	P432148	
		Microcystin LY	0.10	U	ug/L	P432148	
		Microcystin RR	0.10	U	ug/L	P432148	
		Microcystin WR	0.50	U	ug/L	P432148	
		Neosaxitoxin	0.50	U	ug/L	P432149	
		Microcystin YR	0.25	U	ug/L	P432148	
		Saxitoxin	0.50	U	ug/L	P432149	
		Nodularin-R	0.10	U	ug/L	P432148	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432193

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432420

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432265

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432232

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432198

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

Reference Method: EPA 8321B
Batch ID: P432148

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: P432149

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: P432193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432420

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: P432265

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432232

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432198

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

Reference Method: EPA 8321B
Batch ID: P432148

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	95.4		P	40 - 160
Desmethyl microcystin LR	94.9		P	40 - 160
Microcystin H1LR	93.7		P	40 - 160
Microcystin HtyR	89.6		P	40 - 160
Microcystin LA	101		P	40 - 160
Microcystin LF	83.1		P	40 - 160
Microcystin LR	97.7		P	40 - 160
Microcystin LW	79.6		P	40 - 160
Microcystin LY	89.5		P	40 - 160
Microcystin RR	95.1		P	40 - 160
Microcystin WR	94.9		P	40 - 160
Microcystin YR	81.1		P	40 - 160
Nodularin-R	88.9		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P432149

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	101		P	40 - 150
Neosaxitoxin	84.7		P	40 - 150
Saxitoxin	88.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421757	Ammonia-N	96.6	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422043	Kjeldahl Nitrogen	109	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421630	NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421774	Total-P	97.6	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432198

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421788	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421746	Cylindrospermopsin	91.6	88.5	P/P	40 - 160
2421746	Desmethyl microcystin LR	95.9	98.0	P/P	40 - 160
2421746	Microcystin HiLR	94.9	93.9	P/P	40 - 160
2421746	Microcystin HtyR	90.6	86.3	P/P	40 - 160
2421746	Microcystin LA	98.2	95.1	P/P	40 - 160
2421746	Microcystin LF	101	94.5	P/P	40 - 160
2421746	Microcystin LR	96.7	94.8	P/P	40 - 160
2421746	Microcystin LW	86.2	81.9	P/P	40 - 160
2421746	Microcystin LY	90.6	86.8	P/P	40 - 160
2421746	Microcystin RR	96.1	91.5	P/P	40 - 160
2421746	Microcystin WR	96.8	89.6	P/P	40 - 160
2421746	Microcystin YR	82.9	79.7	P/P	40 - 160
2421746	Nodularin-R	91.2	88.3	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421746	Anatoxin-a	91.1	109	P/P	40 - 150
2421746	Neosaxitoxin	57.8	70.8	P/P	40 - 150
2421746	Saxitoxin	69.6	85.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421805	Color (true)	2.73	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421757	Ammonia-N	2.39	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422043	Kjeldahl Nitrogen	5.89	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421630	NO2NO3-N	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421774	Total-P	3.78	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432198

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421788	O-Phosphate-P	0.397	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P432148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421746	Cylindrospermopsin	3.49	Spike	P	0 - 30
2421746	Desmethyl microcystin LR	2.11	Spike	P	0 - 30
2421746	Microcystin HtIR	1.05	Spike	P	0 - 30
2421746	Microcystin HtyR	4.88	Spike	P	0 - 30
2421746	Microcystin LA	3.21	Spike	P	0 - 30
2421746	Microcystin LF	6.85	Spike	P	0 - 30
2421746	Microcystin LR	1.87	Spike	P	0 - 30
2421746	Microcystin LW	5.17	Spike	P	0 - 30
2421746	Microcystin LY	4.28	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P432148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421746	Microcystin RR	4.95	Spike	P	0 - 30
2421746	Microcystin WR	7.73	Spike	P	0 - 30
2421746	Microcystin YR	3.92	Spike	P	0 - 30
2421746	Nodularin-R	3.23	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421746	Anatoxin-a	17.9	Spike	P	0 - 30
2421746	Neosaxitoxin	20.2	Spike	P	0 - 30
2421746	Saxitoxin	20.1	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2421789

Field Sample ID: HABCE0203_LakeWeir

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	91.3	P	30 - 160
EPA 8321B	Saxitoxin-15N7	118	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A120233

Included Lab Sample IDs: 2421786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120234

Included Lab Sample IDs: 2421788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.6	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120236

Included Lab Sample IDs: 2421789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	104	P/P	50 - 160
Neosaxitoxin	93.1	91.2	P/P	50 - 160
Saxitoxin	95.3	93.0	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A120237

Included Lab Sample IDs: 2421789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	90.4	92.8	P/P	60 - 160
Desmethyl microcystin LR	92.0	90.9	P/P	50 - 160
Microcystin HILR	90.5	88.2	P/P	60 - 160
Microcystin HtyR	83.5	84.0	P/P	60 - 160
Microcystin LA	94.7	94.7	P/P	50 - 160
Microcystin LF	82.0	81.6	P/P	60 - 160
Microcystin LR	89.2	87.2	P/P	60 - 160
Microcystin LW	81.9	78.3	P/P	60 - 160
Microcystin LY	88.8	86.4	P/P	60 - 160
Microcystin RR	89.1	88.2	P/P	60 - 160
Microcystin WR	88.7	89.4	P/P	60 - 160
Microcystin YR	80.4	79.4	P/P	60 - 160
Nodularin-R	85.1	82.5	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120298

Included Lab Sample IDs: 2421787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120324

Included Lab Sample IDs: 2421787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120349

Included Lab Sample IDs: 2421787

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120406

Included Lab Sample IDs: 2421787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	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 SMP	MS
					LCS	
DEP SOP: NU-094-1	Color (true)	99.8			2.73	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	96.6	99.4		2.39
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	109	101		5.89
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102	104		1.31
EPA 365.1 Rev. 2.0	Total-P	100	97.6	102		3.78
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	100	101		0.397
EPA 8321B	Anatoxin-a	101	91.1	109		17.9
	Cylindrospermopsin	95.4	91.6	88.5		3.49
	Desmethyl microcystin LR	94.9	95.9	98.0		2.11
	Microcystin HILR	93.7	94.9	93.9		1.05
	Microcystin HtyR	89.6	90.6	86.3		4.88
	Microcystin LA	101	98.2	95.1		3.21
	Microcystin LF	83.1	101	94.5		6.85
	Microcystin LR	97.7	96.7	94.8		1.87
	Microcystin LW	79.6	86.2	81.9		5.17
	Microcystin LY	89.5	90.6	86.8		4.28
	Microcystin RR	95.1	96.1	91.5		4.95
	Microcystin WR	94.9	96.8	89.6		7.73
	Microcystin YR	81.1	82.9	79.7		3.92
	Neosaxitoxin	84.7	57.8	70.8		20.2
	Nodularin-R	88.9	91.2	88.3		3.23
	Saxitoxin	88.7	69.6	85.2		20.1

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2421786
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2421787
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2421787
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2421787
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2421787
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2421788
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2421789
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2421789

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	07/07/2023			07/07/2023 15:25	Chandler E Cox	2421786
EPA 350.1 Rev. 2.0	07/07/2023			07/13/2023 11:23	Khloe J Berg	2421787
EPA 351.2 Rev. 2.0	07/07/2023	07/11/2023 09:49	Samantha L Bates	07/12/2023 13:51	Samantha L Bates	2421787
EPA 353.2 Rev. 2.0	07/07/2023			07/13/2023 13:18	Judith K. Clark	2421787
EPA 365.1 Rev. 2.0	07/07/2023	07/10/2023 17:27	Adam P Silver	07/11/2023 17:00	Simonne.V. Calhoun	2421787
EPA 365.1 Rev. 2.0 dissolved	07/07/2023			07/07/2023 15:40	Elise M. Gillis	2421788
EPA 8321B	07/07/2023	07/07/2023 12:00	Tae K Lee	07/07/2023 17:38	Hana Lee	2421789
	07/07/2023	07/07/2023 12:00	Tae K Lee	07/08/2023 00:06	Juyoung Kim	2421789