

Chemical Analysis Report

CEN-DIST-2017-10-04-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Grasshopper Lk**
Request ID: **RQ-2017-10-02-59**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 18-OCT-2017 14:59

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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 group are included in this report: Nutrients.

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 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: GRASSHOPPER LAKE SOUTH @ 325M SE OF BOAT RAMP **Collection Date/Time: 10/03/2017 12:30**

Field ID: G2CE0070

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1933825	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P332735	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P332940	
		Sulfate	4.6		mg SO4/L	P332943	
	SM 2120 B	Color (true)	49		PCU	P332749	
	SM 2320 B-97	Total Alkalinity	1.0	I	mg CaCO3/L	P333072	
	SM 2540 C-97	TDS	39		mg/L	P333044	
	SM 2540 D-97	TSS	3	I	mg/L	P333090	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333076	
1933826	EPA 350.1 Rev. 2.0	Ammonia-N	0.067		mg N/L	P333177	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P332879	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P332971	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P332808	
	SM 5310 B-00	Organic Carbon	6.5		mg C/L	P332960	
1933827	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332730	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P332735

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P332940

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P332943

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P333177

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P332879

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332971

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332808

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332730

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

Reference Method: SM 2120 B
Batch ID: P332749

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P333072

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-97
Batch ID: P333044

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P333090

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P333076

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P332960

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332940

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332943

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333177

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332879

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332808

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P333072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P333076

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P332960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933750	Chloride	101		P	90 - 110
1933860	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933750	Sulfate	97.9		P	90 - 110
1933860	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933778	Ammonia-N	99.9	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933826	Kjeldahl Nitrogen	96.3	93.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933826	NO2NO3-N	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933838	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933827	O-Phosphate-P	92.2	93.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P333076

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933836	Fluoride	98.4	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P332960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1933778	Organic Carbon	96.2	97.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P332735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933773	Turbidity	5.92	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933750	Chloride	0.404	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933750	Sulfate	0.463	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933778	Ammonia-N	1.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933826	Kjeldahl Nitrogen	1.98	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933826	NO2NO3-N	0.462	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933838	Total-P	0.0476	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933827	O-Phosphate-P	1.72	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P332749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933789	Color (true)	0.455	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P333072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933836	Total Alkalinity	0.376	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P333044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933789	TDS	5.56	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P333076

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933836	Fluoride	0.482	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P332960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1933778	Organic Carbon	1.15	Spike	P	0 - 20

Quality Assurance Report Precision

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A79337

Included Lab Sample IDs: 1933827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A79338

Included Lab Sample IDs: 1933825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A79343

Included Lab Sample IDs: 1933825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A79401

Included Lab Sample IDs: 1933825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	107	108	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A79419

Included Lab Sample IDs: 1933826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A79421

Included Lab Sample IDs: 1933826

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: A79422

Included Lab Sample IDs: 1933826

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A79461

Included Lab Sample IDs: 1933826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A79462

Included Lab Sample IDs: 1933825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A79462

Included Lab Sample IDs: 1933825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A79489

Included Lab Sample IDs: 1933826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	102	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				5.92	
EPA 300.0 Rev. 2.1	Chloride	103	101 102		0.404	
	Sulfate	98.7	97.9 100		0.463	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.9 97.9			1.89
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	96.3 93.6			1.98
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	108	108 108			0.462
EPA 365.1 Rev. 2.0	Total-P	99.8	101 100			0.0476
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	92.2 93.8			1.72
SM 2120 B	Color (true)				0.455	
SM 2320 B-97	Total Alkalinity	102			0.376	
SM 2540 C-97	TDS				5.56	
SM 4500 F-C-97	Fluoride	98.8	98.4 99.0			0.482
SM 5310 B-00	Organic Carbon	97.6	96.2 97.4			1.15

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
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Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1933825
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1933825
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1933825
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1933826
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1933826
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1933826
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1933826
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1933827
SM 2120 B / E31780	True Color measured at 450 nm	1933825
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1933825
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1933825
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1933825
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1933825
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1933826

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/04/2017			10/04/2017 16:16	DeAsia Armster	1933825
EPA 300.0 Rev. 2.1	10/04/2017			10/06/2017	Julia Storbeck	1933825
EPA 350.1 Rev. 2.0	10/04/2017			10/10/2017	Sofia Elnemr	1933826
EPA 351.2 Rev. 2.0	10/04/2017	10/06/2017	Adrian Shelby	10/09/2017	Joseph Suarez	1933826
EPA 353.2 Rev. 2.0	10/04/2017			10/09/2017	Beverly Y. Sanders	1933826
EPA 365.1 Rev. 2.0	10/04/2017	10/05/2017	Sima Feizi	10/09/2017	Lipi Saha	1933826
EPA 365.1 Rev. 2.0 dissolved	10/04/2017			10/04/2017 15:13	Megan Treadwell	1933827
SM 2120 B	10/04/2017			10/04/2017 16:29	Tanya Welborn	1933825
SM 2320 B-97	10/04/2017			10/10/2017	Dale L. Simmons	1933825
SM 2540 C-97	10/04/2017			10/06/2017	Yijie Li	1933825
SM 2540 D-97	10/04/2017			10/06/2017	Yijie Li	1933825
SM 4500 F-C-97	10/04/2017			10/10/2017	Dale L. Simmons	1933825
SM 5310 B-00	10/04/2017			10/07/2017	Ping Hua	1933826