

Chemical Analysis Report

CEN-DIST-2017-01-24-02

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

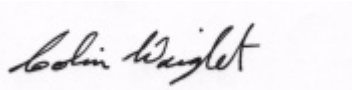
Event Description: **Lk Ellen/Lk Concord**
Request ID: **RQ-2017-01-23-65**
Customer: **CEN-DIST**
Project ID: **SMP**

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, PhD, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 15-FEB-2017 12:00

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: LAKE ELLEN @ CENTER

Collection Date/Time: 01/23/2017 11:45

Field ID: G2CE0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866113	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P318640	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P319053	
		Sulfate	13		mg SO4/L	P319056	
	SM 2120 B	Color (true)	26		PCU	P318636	
	SM 2320 B-97	Total Alkalinity	8.4		mg CaCO3/L	P318827	
	SM 2540 C-97	TDS	65		mg/L	P319148	
	SM 2540 D-97	TSS	2	U	mg/L	P319044	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P318829	
1866114	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P318841	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P318751	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P318880	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P318676	
	SM 5310 B-00	Organic Carbon	6.0		mg C/L	P318781	
1866115	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318647	

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: P318640

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P319053

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P319056

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P318841

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P318751

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: P318880

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318676

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318647

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

Reference Method: SM 2120 B
Batch ID: P318636

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P318827

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

Reference Method: SM 2540 C-97
Batch ID: P319148

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P319044

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P318829

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P318781

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: P319053

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319056

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318841

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318751

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318880

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318647

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

Reference Method: SM 2320 B-97
Batch ID: P318827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P318829

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P318781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319053

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866104	Chloride	102		P	90 - 110
1866250	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319056

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866104	Sulfate	97.2		P	90 - 110
1866250	Sulfate	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318841

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1865244	Ammonia-N	109	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318751

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866152	Kjeldahl Nitrogen	101	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318880

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866017	NO2NO3-N	101	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1865984	Total-P	98.7	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318647

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1865824	O-Phosphate-P	97.4	97.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P318829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1865813	Fluoride	98.6	98.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P318781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866114	Organic Carbon	92.6	90.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P318640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866103	Turbidity	5.77	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866104	Chloride	0.496	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866104	Sulfate	1.72	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865244	Ammonia-N	3.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318751

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866152	Kjeldahl Nitrogen	2.77	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318880

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: P318880

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866017	NO2NO3-N	1.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865984	Total-P	1.86	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318647

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865824	O-Phosphate-P	0.491	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P318636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865979	Color (true)	0.117	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P318827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865813	Total Alkalinity	0.579	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P319148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866098	TDS	3.80	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P318829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1865813	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P318781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866114	Organic Carbon	1.48	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: SM 2120 B
Run ID: A74080
Included Lab Sample IDs: 1866113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A74081
Included Lab Sample IDs: 1866113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A74083
Included Lab Sample IDs: 1866115

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

Reference Method: SM 5310 B-00
Run ID: A74125
Included Lab Sample IDs: 1866114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.1	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A74130
Included Lab Sample IDs: 1866114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A74138
Included Lab Sample IDs: 1866113

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

Reference Method: SM 4500 F-C-97
Run ID: A74138
Included Lab Sample IDs: 1866113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74141

Included Lab Sample IDs: 1866114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A74147

Included Lab Sample IDs: 1866114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74157

Included Lab Sample IDs: 1866114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A74206

Included Lab Sample IDs: 1866113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	98.4	93.3	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				5.77	
EPA 300.0 Rev. 2.1	Chloride	101	102	102	0.496	
	Sulfate	100	97.2	97.0	1.72	
EPA 350.1 Rev. 2.0	Ammonia-N	95.4	109	105		3.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.9	101	105		2.77
EPA 353.2 Rev. 2.0	NO2NO3-N	101	101	98.9		1.69
EPA 365.1 Rev. 2.0	Total-P	97.8	98.7	101		1.86
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.4	97.9		0.491
SM 2120 B	Color (true)				0.117	
SM 2320 B-97	Total Alkalinity	104			0.579	
SM 2540 C-97	TDS				3.80	
SM 4500 F-C-97	Fluoride	98.2	98.6	98.6		0.0
SM 5310 B-00	Organic Carbon	96.8	92.6	90.8		1.48

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1866113
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1866113
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1866113
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1866114
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1866114
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1866114
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1866114
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1866115
SM 2120 B / E31780	True Color measured at 450 nm	1866113
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1866113
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1866113
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1866113
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1866113
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1866114

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	01/24/2017			01/24/2017 15:36	Sima Feizi	1866113
EPA 300.0 Rev. 2.1	01/24/2017			01/31/2017	Ping Hua	1866113
EPA 350.1 Rev. 2.0	01/24/2017			01/26/2017	Sofia Elnemr	1866114
EPA 351.2 Rev. 2.0	01/24/2017	01/26/2017	Adrian Shelby	01/27/2017	Joseph Suarez	1866114
EPA 353.2 Rev. 2.0	01/24/2017			01/27/2017	Beverly Y. Sanders	1866114
EPA 365.1 Rev. 2.0	01/24/2017	01/25/2017	Vijayalakshmi Reddy	01/26/2017	Lipi Saha	1866114
EPA 365.1 Rev. 2.0 dissolved	01/24/2017			01/24/2017 16:29	Julie Michelle Frank	1866115
SM 2120 B	01/24/2017			01/24/2017 15:38	Jared I. Manley	1866113
SM 2320 B-97	01/24/2017			01/26/2017	Dale L. Simmons	1866113
SM 2540 C-97	01/24/2017			01/27/2017	Blanca Fach	1866113
SM 2540 D-97	01/24/2017			01/27/2017	Blanca Fach	1866113
SM 4500 F-C-97	01/24/2017			01/26/2017	Dale L. Simmons	1866113
SM 5310 B-00	01/24/2017			01/25/2017	Julie Michelle Frank	1866114