

Chemical Analysis Report

NW-DIST-2016-07-13-02

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

Event Description: **TMDL Bioassessment**
Request ID: **RQ-2016-07-04-37**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
Pensacola, FL 32502-5794
Attn: Michael King

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-AUG-2016 14:45

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: DEER MOSS CREEK

Collection Date/Time: 07/12/2016 11:40

Field ID: G3NW0045

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815541	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P307900	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P308871	
		Sulfate	9.9		mg SO4/L	P308874	
	SM 2120 B	Color (true)	7.6		PCU	P307824	
	SM 2320 B-97	Total Alkalinity	19	AJ	mg CaCO3/L	P308418	RPD
	SM 2540 C-97	TDS	65		mg/L	P308585	
	SM 2540 D-97	TSS	3	I	mg/L	P308395	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P308422	
1815542	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P308342	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23		mg N/L	P308332	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.1		mg N/L	P308708	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P308014	
	SM 5310 B-00	Organic Carbon	1.6		mg C/L	P308412	
1815543	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.036		mg P/L	P307858	

Ref. Method and Comment:

SM 2320 B-97: Refer to the narrative for an explanation of QC Codes.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P307900

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P308871

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P308874

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P308342

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P308332

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: P308708

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308014

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307858

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

Reference Method: SM 2120 B
Batch ID: P307824

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P308418

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

Reference Method: SM 2540 C-97
Batch ID: P308585

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P308395

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P308422

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P308412

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: P308871

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308874

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308342

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308332

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308708

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308014

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307858

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

Reference Method: SM 2320 B-97
Batch ID: P308418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P308422

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P308412

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815347	Chloride	100		P	90 - 110
1815541	Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815347	Sulfate	96.1		P	90 - 110
1815541	Sulfate	94.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815542	Ammonia-N	94.4	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308332

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815502	Kjeldahl Nitrogen	94.9	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308708

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815941	NO2NO3-N	94.1	93.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815549	Total-P	99.5	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307858

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815543	O-Phosphate-P	100	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P308422

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815541	Fluoride	104	104	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P308412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815471	Organic Carbon	93.6	93.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815439	Turbidity	6.06	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815347	Chloride	0.132	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815347	Sulfate	0.285	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815542	Ammonia-N	2.48	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308332

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815502	Kjeldahl Nitrogen	2.79	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308708

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: P308708

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815941	NO2NO3-N	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815549	Total-P	4.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307858

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815543	O-Phosphate-P	0.147	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815569	Color (true)	1.90	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P308418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815541	Total Alkalinity	11.0	Sample	F	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P308585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815395	TDS	4.79	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P308422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815541	Fluoride	0.482	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P308412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815471	Organic Carbon	0.377	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: A70524
Included Lab Sample IDs: 1815541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.5	95.6	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70533
Included Lab Sample IDs: 1815543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70544
Included Lab Sample IDs: 1815541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	99.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A70640
Included Lab Sample IDs: 1815542

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A70675
Included Lab Sample IDs: 1815542

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

Reference Method: SM 5310 B-00
Run ID: A70693
Included Lab Sample IDs: 1815542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	98.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A70694
Included Lab Sample IDs: 1815541

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A70694

Included Lab Sample IDs: 1815541

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A70734

Included Lab Sample IDs: 1815542

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A70779

Included Lab Sample IDs: 1815542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.5	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70802

Included Lab Sample IDs: 1815541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Sulfate	96.6	99.9	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					6.06	
EPA 300.0 Rev. 2.1	Chloride	100	100	98.3		0.132	
	Sulfate	95.9	96.1	94.5		0.285	
EPA 350.1 Rev. 2.0	Ammonia-N	95.5	94.4	96.9			2.48
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.7	94.9	98.9			2.79
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	94.1	93.1			1.04
EPA 365.1 Rev. 2.0	Total-P	93.6	99.5	94.4			4.90
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	100	101			0.147
SM 2120 B	Color (true)					1.90	
SM 2320 B-97	Total Alkalinity	103				11.0	
SM 2540 C-97	TDS					4.79	
SM 4500 F-C-97	Fluoride	99.3	104	104			0.482
SM 5310 B-00	Organic Carbon	96.7	93.6	93.0			0.377

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1815541
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1815541
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1815541
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1815542
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1815542
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1815542
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1815542
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1815543
SM 2120 B / E31780	True Color measured at 450 nm	1815541
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1815541
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1815541
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1815541
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1815541
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1815542

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	07/13/2016			07/13/2016 15:26	Sima Feizi	1815541
EPA 300.0 Rev. 2.1	07/13/2016			07/29/2016	Ping Hua	1815541
EPA 350.1 Rev. 2.0	07/13/2016			07/20/2016	Diana M. Turner	1815542
EPA 351.2 Rev. 2.0	07/13/2016	07/21/2016	Sofia Elnemr	07/22/2016	Christopher Armour	1815542
EPA 353.2 Rev. 2.0	07/13/2016			07/27/2016	Beverly Y. Sanders	1815542
EPA 365.1 Rev. 2.0	07/13/2016	07/15/2016	Vijayalakshmi Reddy	07/20/2016	Lipi Saha	1815542
EPA 365.1 Rev. 2.0 dissolved	07/13/2016			07/13/2016 15:02	Julia Storbeck	1815543
SM 2120 B	07/13/2016			07/13/2016 12:38	Rochelle Y Jackson	1815541
SM 2320 B-97	07/13/2016			07/20/2016	Dale L. Simmons	1815541
SM 2540 C-97	07/13/2016			07/15/2016	Yijie Li	1815541
SM 2540 D-97	07/13/2016			07/15/2016	Yijie Li	1815541
SM 4500 F-C-97	07/13/2016			07/20/2016	Dale L. Simmons	1815541
SM 5310 B-00	07/13/2016			07/20/2016	Sofia Elnemr	1815542