Chemical Analysis Report

CEN-DIST-2020-12-04-01

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

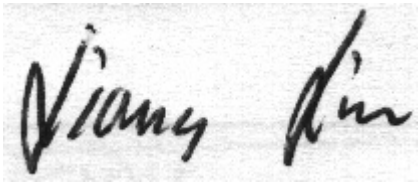
Event Description: **East Lake Tohopekaliga Drain**
Request ID: **RQ-2020-12-07-19**
Customer: **CEN-DIST**
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 22-DEC-2020 15:54



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 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: Boggy Creek 1100m S of Boggy Creek Road **Collection Date/Time: 12/03/2020 12:54**

Field ID: G4CE0127 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2210749	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P390798	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P390876	
		Sulfate	6.1		mg SO4/L	P390878	
	SM 2120 B-2011	Color (true)	84	A	PCU	P390704	
	SM 2320 B-2011	Total Alkalinity	43		mg CaCO3/L	P390810	
	SM 2540 C-2011	TDS	116	A	mg/L	P391168	
	SM 2540 D-2011	TSS	2	I A	mg/L	P391148	
	SM 4500 F-C-2011	Fluoride	0.065	I	mg F/L	P390815	
2210750	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P391077	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P391045	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P390822	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P390864	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P390896	
2210751	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	I	mg P/L	P390719	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390798

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390876

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390878

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391077

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391045

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390822

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390719

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

Reference Method: SM 2120 B-2011
Batch ID: P390704

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P390810

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

Reference Method: SM 2540 C-2011
Batch ID: P391168

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P391148

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P390815

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P390896

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: P390876

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390878

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391077

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: P391045

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390822

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390719

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

Reference Method: SM 2120 B-2011
Batch ID: P390704

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

Reference Method: SM 2320 B-2011
Batch ID: P390810

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P390815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P390896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390876

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210512	Chloride	99.0		P	90 - 110
2210785	Chloride	95.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210512	Sulfate	99.3		P	90 - 110
2210785	Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210513	Ammonia-N	95.8	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390822

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210750	NO2NO3-N	99.4	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210359	Total-P	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390719

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211157	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P390815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210831	Fluoride	101	103	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P390896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210395	Organic Carbon	96.9	97.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390798

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210781	Turbidity	0.673	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210785	Chloride	0.780	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210785	Sulfate	0.333	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210513	Ammonia-N	0.122	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210556	Kjeldahl Nitrogen	8.30	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210750	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210359	Total-P	2.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390719

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211157	O-Phosphate-P	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B-2011
Batch ID: P390704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210749	Color (true)	0.606	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P390810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210831	Total Alkalinity	2.14	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P391168

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210749	TDS	3.45	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P390815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210831	Fluoride	0.979	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P390896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210395	Organic Carbon	0.218	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B-2011
Run ID: A102419
Included Lab Sample IDs: 2210749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102425
Included Lab Sample IDs: 2210751

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	99.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A102455
Included Lab Sample IDs: 2210749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	98.9	P/P	90 - 110
Sulfate	99.8	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A102457
Included Lab Sample IDs: 2210749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	103	P/P	95 - 105

Reference Method: SM 2320 B-2011
Run ID: A102461
Included Lab Sample IDs: 2210749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.8	103	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A102461
Included Lab Sample IDs: 2210749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	103	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102464
Included Lab Sample IDs: 2210750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A102488
Included Lab Sample IDs: 2210750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102553
Included Lab Sample IDs: 2210750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.7	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102570
Included Lab Sample IDs: 2210750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A102573
Included Lab Sample IDs: 2210750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	100	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
EPA 180.1 Rev. 2.0	Turbidity					0.673	
EPA 300.0 Rev. 2.1	Chloride	98.3	95.7	99.0		0.780	
	Sulfate	97.2	98.1	99.3		0.333	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	95.8	96.0			0.122
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102					8.30
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.4	99.4			0.0
EPA 365.1 Rev. 2.0	Total-P	108	106	104			2.34
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	100	100			0.0
SM 2120 B-2011	Color (true)	103				0.606	
SM 2320 B-2011	Total Alkalinity	101				2.14	
SM 2540 C-2011	TDS					3.45	
SM 4500 F-C-2011	Fluoride	98.2	101	103			0.979
SM 5310 B-2011	Organic Carbon	98.8	96.9	97.2			0.218

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2210749
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2210749
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2210749
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2210750
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2210750
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2210750
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2210750
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2210751
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2210749
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2210749
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2210749
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2210749
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2210749
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2210750

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	12/04/2020			12/04/2020 16:23	Blanca Fach	2210749
EPA 300.0 Rev. 2.1	12/04/2020			12/08/2020 15:40	Lipi Saha	2210749
EPA 350.1 Rev. 2.0	12/04/2020			12/13/2020 13:18	Ping Hua	2210750
EPA 351.2 Rev. 2.0	12/04/2020	12/11/2020 13:20	Yen Ta	12/14/2020 14:06	Julia Storbeck	2210750
EPA 353.2 Rev. 2.0	12/04/2020			12/08/2020 10:32	Beverly Y. Sanders	2210750
EPA 365.1 Rev. 2.0	12/04/2020	12/08/2020 17:16	Yen Ta	12/14/2020 12:11	Lipi Saha	2210750
EPA 365.1 Rev. 2.0 dissolved	12/04/2020			12/04/2020 16:13	Ping Hua	2210751
SM 2120 B-2011	12/04/2020			12/04/2020 14:03	Benjamin T. Nordmann	2210749
SM 2320 B-2011	12/04/2020			12/07/2020 19:54	Dale L. Simmons	2210749
SM 2540 C-2011	12/04/2020			12/09/2020 14:21	Yijie Li	2210749
SM 2540 D-2011	12/04/2020			12/09/2020 14:21	Yijie Li	2210749
SM 4500 F-C-2011	12/04/2020			12/07/2020 19:54	Dale L. Simmons	2210749
SM 5310 B-2011	12/04/2020			12/08/2020 23:13	David Boose	2210750