Forensic Alcohol Estimate of the Uncertainty of Measurement - Update

Issued: 12/30/2014

Beverage Ethanol

The Forensic Alcohol discipline utilized data from all casework of beverage alcohol analysis performed on both Agilent gas chromatograph/mass spectrometers equipped with a headspace autosampler between June 2012 and December 2014 for the estimate of the uncertainty of measurement for beverage ethanol analysis. Beverage casework can be performed in the batch as blood alcohol analysis and the same quality control procedures are used regardless of sample type. The test method information in the Forensic Alcohol Estimate of Uncertainty of Measurement issued December 20, 2013 has not changed.

Changes to previous uncertainty components

Aqueous (0.025 g/100 mL) QC Reproducibility Data (%RSD)

Reproducibility data collected after last year's measurement uncertainty estimate was used to calculate a new percent relative standard deviation (%RSD) for the 0.025 g/100 mL aqueous control. This new data set was then combined with the previous one and another %RSD was calculated. Results are listed in the table below.

	N	%RSD
Last Year's (6/28/12 - 10/11/13)	130	1.8133
This Year's (10/22/13 - 12/8/14)	123	2.3046
Combined (6/28/12 - 12/8/14)	253	2.1868

The combined (6/28/12 – 12/8/14) %RSD was chosen to be used for this component.

%RSD = 2.1868

Replicate Agreement Requirement (Std $Unc_{Replicates}$)

No changes were made for this component.

Certificate of Analysis - Calibration Reference Standards (Std $Unc_{stds\ cals}$)

The most current calibration certificates for reference standards used were reviewed and it was determined that no changes were needed for this component.

Certificate of Analysis - Control Reference Standards (Std $Unc_{stds\ ctrls}$)

The most current calibration certificates for reference standards used were reviewed and it was determined that no changes were needed for this component.

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Dilutor Calibration (Std Unc_{left} and Std Unc_{right})

The current external calibration laboratory's (Calibrate Inc.) precision passing criterion is a coefficient of variation of less than or equal to 3%. The forensic alcohol discipline's precision passing criterion when performing internal checks of the dilutors is a coefficient of variation of less than or equal to 1%. Both of these passing criteria are larger than Hamilton's passing criterion of 0.2% which was used for this uncertainty component last year. The alcohol discipline's internal passing criterion was chosen to be used for this component.

$$Std\ Unc_{left} = Std\ Unc_{right} = \frac{1\%}{\sqrt{3}} = 0.5774$$

Addition of new uncertainty components

No new uncertainty components were added to the budget.

Combined standard uncertainty using component updates

The following table summarizes changes made to component values and the new estimated combined uncertainty (items that changed are highlighted).

Uncertainty Component	2013	2014
%RSD	1.8133	2.1868
Std $Unc_{Replicates}$	1.7321	1.7321
Std $Unc_{stds\ cals}$	0.175	0.175
Std $Unc_{stds\ ctrls}$	0.175	0.175
Std Unc_{left}	0.1155	0.5774
Std Unc_{right}	0.1155	0.5774
Combined Uncertainty (k=2)	5.0501	5.8343

Reported uncertainty

The expanded combined standard uncertainty rounded to 2 significant figures is:

Expanded Combined Standard Uncertainty = ± 5.8%

This is an increase when compared to last year's estimated measurement uncertainty.

Beginning in 2015 a beverage control will be required for use for beverage casework. Until enough data is collected from this control to perform an updated estimate of uncertainty, beverage cases will not be analyzed. Data collection will be obtained on the beverage control by placing it in with blood alcohol batches. Once the new estimate has been obtained, beverage casework will begin and this report will be updated.

N=	253	Mean=	0.0252	SD=	0.0006	SD*2=	0.0011	%RSD=	2.1868	%RSD*2	4.4	%Bias	0.9
Date	Anaylst	Instrument	Pipetter	Lot	Value	Reported							
6/28/2012	CRF	HS2	Wilma	FN032210-01	0.0250								
6/28/2012	CRF	HS2	Wilma	FN032210-01	0.0257	0.025							
6/28/2012	CRF	HS2	Wilma	FN032210-01	0.0253								
6/28/2012	CRF	HS2	Wilma	FN032210-01	0.0256	0.025							
6/29/2012	bmb	HS2	Wilma	FN032210-01	0.0257								
6/29/2012	bmb	HS2	Wilma	FN032210-01	0.0257	0.025							
6/29/2012	bmb	HS2	Wilma	FN032210-01	0.0255								
6/29/2012	bmb	HS2	Wilma	FN032210-01	0.0259	0.025							
7/3/2012	CRF	HS2	Wilma	FN032210-01	0.0254								
7/3/2012	CRF	HS2	Wilma	FN032210-01	0.0254	0.025							
7/3/2012	CRF	HS2	Wilma	FN032210-01	0.0249								
7/3/2012	CRF	HS2	Wilma	FN032210-01	0.0255	0.025							
7/9/2012	bmb	HS2	Wilma	FN032210-01	0.0250								
7/9/2012	bmb	HS2	Wilma	FN032210-01	0.0254	0.025							
7/9/2012	bmb	HS2	Wilma	FN032210-01	0.0250								
7/9/2012	bmb	HS2	Wilma	FN032210-01	0.0254	0.025							
7/10/2012	COB	HS2	Wilma	FN032210-01	0.0251								
7/10/2012	COB	HS2	Wilma	FN032210-01	0.0253	0.025							
7/10/2012	COB	HS2	Wilma	FN032210-01	0.0260								
7/10/2012	COB	HS2	Wilma	FN032210-01	0.0261	0.026							
7/11/2012	CRF	HS2	Wilma	FN032210-01	0.0257								
7/11/2012	CRF	HS2	Wilma	FN032210-01	0.0261	0.025							
7/11/2012	CRF	HS2	Wilma	FN032210-01	0.0259								
7/11/2012	CRF	HS2	Wilma	FN032210-01	0.0261	0.026							
7/16/2012	bmb	HS2	Wilma	FN032210-01	0.0257								
7/16/2012	bmb	HS2	Wilma	FN032210-01	0.0258	0.025							
7/16/2012	bmb	HS2	Wilma	FN032210-01	0.0260								
7/16/2012	bmb	HS2	Wilma	FN032210-01	0.0260	0.026							
7/18/2012	COB	HS2	Wilma	FN032210-01	0.0252								
7/18/2012	COB	HS2	Wilma	FN032210-01	0.0255	0.025							
7/18/2012	COB	HS2	Wilma	FN032210-01	0.0255								
7/18/2012	COB	HS2	Wilma	FN032210-01	0.0260	0.025							
7/26/2012	CRF	HS2	Wilma	FN032210-01	0.0258								
7/26/2012	CRF	HS2	Wilma	FN032210-01	0.0256	0.025							
7/26/2012	CRF	HS2	Wilma	FN032210-01	0.0256								
7/26/2012	CRF	HS2	Wilma	FN032210-01	0.0260	0.025							
7/30/2012	COB	HS2	Wilma	FN032210-01	0.0244								
7/30/2012	COB	HS2	Wilma	FN032210-01	0.0242	0.024							
7/30/2012	COB	HS2	Wilma	FN032210-01	0.0238								
7/30/2012	COB	HS2	Wilma	FN032210-01	0.0245	0.024							
8/2/2012	COB	HS2	Wilma	FN032210-01	0.0254								
8/2/2012	COB	HS2	Wilma	FN032210-01	0.0254	0.025							
8/2/2012	COB	HS2	Wilma	FN032210-01	0.0259								
8/2/2012	COB	HS2	Wilma	FN032210-01	0.0257	0.025							
8/9/2012	bmb	HS2	Wilma	FN032210-01	0.0244								
8/9/2012	bmb	HS2	Wilma	FN032210-01	0.0250	0.024							
8/9/2012	bmb	HS2	Wilma	FN032210-01	0.0249								
8/9/2012	bmb	HS2	Wilma	FN032210-01	0.0242	0.024							
8/13/2012	CRF	HS2	Wilma	FN032210-01	0.0254								
8/13/2012	CRF	HS2	Wilma	FN032210-01	0.0254	0.025							
8/13/2012	CRF	HS2	Wilma	FN032210-01	0.0249								
8/13/2012	CRF	HS2	Wilma	FN032210-01	0.0255	0.025							
8/16/2012	CRF	HS2	Wilma	FN032210-01	0.0255								
8/16/2012	CRF	HS2	Wilma	FN032210-01	0.0260	0.025							
8/16/2012	CRF	HS2	Wilma	FN032210-01	0.0256								
8/16/2012	CRF	HS2	Wilma	FN032210-01	0.0262	0.025							
8/22/2012	COB	HS2	Wilma	FN032210-01	0.0253								
8/22/2012	COB	HS2	Wilma	FN032210-01	0.0251	0.025							
8/22/2012	COB	HS2	Wilma	FN032210-01	0.0248								
8/22/2012	COB	HS2	Wilma	FN032210-01	0.0251	0.024							
9/7/2012	COB	HS2	Wilma	FN032210-01	0.0252								
9/7/2012	COB	HS2	Wilma	FN032210-01	0.0256	0.025							
9/7/2012	COB	HS2	Wilma	FN032210-01	0.0251								
9/7/2012	COB	HS2	Wilma	FN032210-01	0.0250	0.025							
9/12/2012	bmb	HS2	Wilma	FN032210-01	0.0246								
9/12/2012	bmb	HS2	Wilma	FN032210-01	0.0246	0.024							
9/12/2012	bmb	HS2	Wilma	FN032210-01	0.0246								
9/12/2012	bmb	HS2	Wilma	FN032210-01	0.0249	0.024							
9/17/2012	CRF	HS2	Wilma	FN032210-01	0.0255								

9/17/2012	CRF	HS2	Wilma	FN032210-01	0.0257	0.025
9/17/2012	CRF	HS2	Wilma	FN032210-01	0.0259	
9/17/2012	CRF	HS2	Wilma	FN032210-01	0.0255	0.025
9/25/2012	COB	HS2	Wilma	FN032210-01	0.0241	
9/25/2012	COB	HS2	Wilma	FN032210-01	0.0251	0.024
9/25/2012	COB	HS2	Wilma	FN032210-01	0.0247	
9/25/2012	COB	HS2	Wilma	FN032210-01	0.0246	0.024
10/5/2012	COB	HS2	Wilma	FN032210-01	0.0257	
10/5/2012	COB	HS2	Wilma	FN032210-01	0.0261	0.025
10/5/2012	COB	HS2	Wilma	FN032210-01	0.0263	
10/5/2012	COB	HS2	Wilma	FN032210-01	0.0270	0.026
10/15/2012	CRF	HS2	Wilma	FN032210-01	0.0253	
10/15/2012	CRF	HS2	Wilma	FN032210-01	0.0256	0.025
10/15/2012	CRF	HS2	Wilma	FN032210-01	0.0254	
10/15/2012	CRF	HS2	Wilma	FN032210-01	0.0253	0.025
10/17/2012	bmb	HS2	Wilma	FN032210-01	0.0251	
10/17/2012	bmb	HS2	Wilma	FN032210-01	0.0250	0.025
10/17/2012	bmb	HS2	Wilma	FN032210-01	0.0248	
10/17/2012	bmb	HS2	Wilma	FN032210-01	0.0255	0.025
10/19/2012	CRF	HS2	Wilma	FN032210-01	0.0255	
10/19/2012	CRF	HS2	Wilma	FN032210-01	0.0258	0.025
10/19/2012	CRF	HS2	Wilma	FN032210-01	0.0256	
10/19/2012	CRF	HS2	Wilma	FN032210-01	0.0261	0.025
10/23/2012	COB	HS2	Wilma	FN032210-01	0.0258	
10/23/2012	COB	HS2	Wilma	FN032210-01	0.0259	0.025
10/23/2012	COB	HS2	Wilma	FN032210-01	0.0258	
10/23/2012	COB	HS2	Wilma	FN032210-01	0.0257	0.025
11/2/2012	bmb	HS2	ML600-1	FN032210-01	0.0251	
11/2/2012	bmb	HS2	ML600-1	FN032210-01	0.0258	0.025
11/2/2012	bmb	HS2	ML600-1	FN032210-01	0.0252	
11/2/2012	bmb	HS2	ML600-1	FN032210-01	0.0256	0.025
11/6/2012	CRF	HS2	ML600-1	FN032210-01	0.0250	
11/6/2012	CRF	HS2	ML600-1	FN032210-01	0.0252	0.025
11/6/2012	CRF	HS2	ML600-1	FN032210-01	0.0250	
11/6/2012	CRF	HS2	ML600-1	FN032210-01	0.0255	0.025
11/16/2012	COB	HS2	ML600-1	FN032210-01	0.0259	
11/16/2012	COB	HS2	ML600-1	FN032210-01	0.0257	0.025
11/16/2012	COB	HS2	ML600-1	FN032210-01	0.0255	
11/16/2012	COB	HS2	ML600-1	FN032210-01	0.0261	0.025
11/16/2012	bmb	HS2	ML600-1	FN032210-01	0.0257	
11/16/2012	bmb	HS2	ML600-1	FN032210-01	0.0259	0.025
11/16/2012	bmb	HS2	ML600-1	FN032210-01	0.0256	
11/16/2012	bmb	HS2	ML600-1	FN032210-01	0.0258	0.025
11/20/2012	CRF	HS2	ML600-1	FN032210-01	0.0256	
11/20/2012	CRF	HS2	ML600-1	FN032210-01	0.0256	0.025
11/20/2012	CRF	HS2	ML600-1	FN032210-01	0.0258	
11/20/2012	CRF	HS2	ML600-1	FN032210-01	0.0261	0.025
11/28/2012	COB	HS2	ML600-1	FN032210-01	0.0249	
11/28/2012	COB	HS2	ML600-1	FN032210-01	0.0252	0.025
11/28/2012	COB	HS2	ML600-1	FN032210-01	0.0247	
11/28/2012	COB	HS2	ML600-1	FN032210-01	0.0254	0.025
12/3/2012	CRF	HS1	ML600-1	FN032210-01	0.0252	
12/3/2012	CRF	HS1	ML600-1	FN032210-01	0.0256	0.025
12/3/2012	CRF	HS1	ML600-1	FN032210-01	0.0253	
12/3/2012	CRF	HS1	ML600-1	FN032210-01	0.0255	0.025
12/13/2012	bmb	HS2	ML600-1	FN032210-01	0.0251	
12/13/2012	bmb	HS2	ML600-1	FN032210-01	0.0251	0.025
12/13/2012	bmb	HS2	ML600-1	FN032210-01	0.0256	
12/13/2012	bmb	HS2	ML600-1	FN032210-01	0.0254	0.025
12/21/2012	COB	HS2	ML600-1	FN032210-01	0.0252	
12/21/2012	COB	HS2	ML600-1	FN032210-01	0.0249	0.025
12/21/2012	COB	HS2	ML600-1	FN032210-01	0.0254	
12/21/2012	COB	HS2	ML600-1	FN032210-01	0.0254	0.025
12/26/2012	CRF	HS1	ML600-1	FN032210-01	0.0254	
12/26/2012	CRF	HS1	ML600-1	FN032210-01	0.0251	0.025
12/26/2012	CRF	HS1	ML600-1	FN032210-01	0.0255	
12/26/2012	CRF	HS1	ML600-1	FN032210-01	0.0255	0.025
1/14/2013	COB	HS2	ML600-1	FN032210-01	0.0249	
1/14/2013	COB	HS2	ML600-1	FN032210-01	0.0255	0.025
1/14/2013	COB	HS2	ML600-1	FN032210-01	0.0253	
1/14/2013	COB	HS2	ML600-1	FN032210-01	0.0255	0.025

1/24/2013	bmb	HS2	ML600-1	FN032210-01	0.0249	
1/24/2013	bmb	HS2	ML600-1	FN032210-01	0.0252	0.025
1/24/2013	bmb	HS2	ML600-1	FN032210-01	0.0252	
1/24/2013	bmb	HS2	ML600-1	FN032210-01	0.0254	0.025
1/28/2013	CRF	HS1	ML600-1	FN032210-01	0.0251	
1/28/2013	CRF	HS1	ML600-1	FN032210-01	0.0256	0.025
1/28/2013	CRF	HS1	ML600-1	FN032210-01	0.0257	
1/28/2013	CRF	HS1	ML600-1	FN032210-01	0.0260	0.025
2/6/2013	COB	HS1	ML600-1	FN032210-01	0.0261	
2/6/2013	COB	HS1	ML600-1	FN032210-01	0.0261	0.026
2/6/2013	COB	HS1	ML600-1	FN032210-01	0.0260	
2/6/2013	COB	HS1	ML600-1	FN032210-01	0.0265	0.026
2/12/2013	COB	HS2	ML600-1	FN032210-01	0.0253	
2/12/2013	COB	HS2	ML600-1	FN032210-01	0.0253	0.025
2/12/2013	COB	HS2	ML600-1	FN032210-01	0.0257	
2/12/2013	COB	HS2	ML600-1	FN032210-01	0.0256	0.025
2/25/2013	bmb	HS2	ML600-1	FN032210-01	0.0251	
2/25/2013	bmb	HS2	ML600-1	FN032210-01	0.0255	0.025
2/25/2013	bmb	HS2	ML600-1	FN032210-01	0.0255	
2/25/2013	bmb	HS2	ML600-1	FN032210-01	0.0258	0.025
3/7/2013	CRF	HS1	ML600-1	FN032210-01	0.0257	
3/7/2013	CRF	HS1	ML600-1	FN032210-01	0.0254	0.025
3/7/2013	CRF	HS1	ML600-1	FN032210-01	0.0254	
3/7/2013	CRF	HS1	ML600-1	FN032210-01	0.0254	0.025
3/12/2013	COB	HS2	ML600-1	FN032210-01	0.0253	
3/12/2013	COB	HS2	ML600-1	FN032210-01	0.0255	0.025
3/12/2013	COB	HS2	ML600-1	FN032210-01	0.0257	
3/12/2013	COB	HS2	ML600-1	FN032210-01	0.0253	0.025
3/26/2013	CRF	HS1	ML600-1	FN032210-01	0.0253	
3/26/2013	CRF	HS1	ML600-1	FN032210-01	0.0255	0.025
3/26/2013	CRF	HS1	ML600-1	FN032210-01	0.0255	
3/26/2013	CRF	HS1	ML600-1	FN032210-01	0.0256	0.025
4/2/2013	bmb	HS2	Wilma	FN032210-01	0.0259	
4/2/2013	bmb	HS2	Wilma	FN032210-01	0.0260	0.025
4/2/2013	bmb	HS2	Wilma	FN032210-01	0.0256	
4/2/2013	bmb	HS2	Wilma	FN032210-01	0.0263	0.025
4/15/2013	CRF	HS2	Wilma	FN032210-01	0.0252	
4/15/2013	CRF	HS2	Wilma	FN032210-01	0.0258	0.025
4/15/2013	CRF	HS2	Wilma	FN032210-01	0.0257	
4/15/2013	CRF	HS2	Wilma	FN032210-01	0.0259	0.025
4/25/2013	COB	HS1	Wilma	FN081712-01	0.0258	
4/25/2013	COB	HS1	Wilma	FN081712-01	0.0258	0.025
4/25/2013	COB	HS1	Wilma	FN081712-01	0.0262	
4/25/2013	COB	HS1	Wilma	FN081712-01	0.0264	0.026
4/30/2013	bmb	HS2	Wilma	FN081712-01	0.0260	
4/30/2013	bmb	HS2	Wilma	FN081712-01	0.0261	0.026
4/30/2013	bmb	HS2	Wilma	FN081712-01	0.0263	
4/30/2013	bmb	HS2	Wilma	FN081712-01	0.0264	0.026
5/7/2013	COB	HS1	Wilma	FN081712-01	0.0256	
5/7/2013	COB	HS1	Wilma	FN081712-01	0.0257	0.025
5/7/2013	COB	HS1	Wilma	FN081712-01	0.0255	
5/7/2013	COB	HS1	Wilma	FN081712-01	0.0259	0.025
5/14/2013	CRF	HS2	Wilma	FN081712-01	0.0261	
5/14/2013	CRF	HS2	Wilma	FN081712-01	0.0264	0.026
5/14/2013	CRF	HS2	Wilma	FN081712-01	0.0263	
5/14/2013	CRF	HS2	Wilma	FN081712-01	0.0266	0.026
5/31/2013	bmb	HS2	Wilma	FN081712-01	0.0259	
5/31/2013	bmb	HS2	Wilma	FN081712-01	0.0264	0.026
5/31/2013	bmb	HS2	Wilma	FN081712-01	0.0263	
5/31/2013	bmb	HS2	Wilma	FN081712-01	0.0261	0.026
6/7/2013	CRF	HS1	Wilma	FN081712-01	0.0254	
6/7/2013	CRF	HS1	Wilma	FN081712-01	0.0255	0.025
6/7/2013	CRF	HS1	Wilma	FN081712-01	0.0256	
6/7/2013	CRF	HS1	Wilma	FN081712-01	0.0257	0.025
6/19/2013	bmb	HS2	Wilma	FN081712-01	0.0256	
6/19/2013	bmb	HS2	Wilma	FN081712-01	0.0257	0.025
6/19/2013	bmb	HS2	Wilma	FN081712-01	0.0258	
6/19/2013	bmb	HS2	Wilma	FN081712-01	0.0261	0.025
6/27/2013	CRF	HS1	Wilma	FN081712-01	0.0250	
6/27/2013	CRF	HS1	Wilma	FN081712-01	0.0251	0.025
6/27/2013	CRF	HS1	Wilma	FN081712-01	0.0254	

6/27/2013	CRF	HS1	Wilma	FN081712-01	0.0253	0.025
7/3/2013	bmb	HS1	Wilma	FN081712-01	0.0251	
7/3/2013	bmb	HS1	Wilma	FN081712-01	0.0255	0.025
7/3/2013	bmb	HS1	Wilma	FN081712-01	0.0255	
7/3/2013	bmb	HS1	Wilma	FN081712-01	0.0254	0.025
7/12/2013	CRF	HS2	Wilma	FN081712-01	0.0254	
7/12/2013	CRF	HS2	Wilma	FN081712-01	0.0258	0.025
7/12/2013	CRF	HS2	Wilma	FN081712-01	0.0257	
7/12/2013	CRF	HS2	Wilma	FN081712-01	0.0259	0.025
7/12/2013	bmb	HS1	Wilma	FN081712-01	0.0253	
7/12/2013	bmb	HS1	Wilma	FN081712-01	0.0254	0.025
7/12/2013	bmb	HS1	Wilma	FN081712-01	0.0254	
7/12/2013	bmb	HS1	Wilma	FN081712-01	0.0252	0.025
7/25/2013	COB	HS2	Wilma	FN081712-01	0.0260	
7/25/2013	COB	HS2	Wilma	FN081712-01	0.0257	0.025
7/25/2013	COB	HS2	Wilma	FN081712-01	0.0259	
7/25/2013	COB	HS2	Wilma	FN081712-01	0.0262	0.026
8/14/2013	CRF	HS1	Wilma	FN081712-01	0.0255	
8/14/2013	CRF	HS1	Wilma	FN081712-01	0.0254	0.025
8/14/2013	CRF	HS1	Wilma	FN081712-01	0.0254	
8/14/2013	CRF	HS1	Wilma	FN081712-01	0.0258	0.025
8/19/2013	bmb	HS1	Wilma	FN081712-01	0.0255	
8/19/2013	bmb	HS1	Wilma	FN081712-01	0.0257	0.025
8/19/2013	bmb	HS1	Wilma	FN081712-01	0.0258	
8/19/2013	bmb	HS1	Wilma	FN081712-01	0.0258	0.025
8/20/2013	COB	HS2	Wilma	FN081712-01	0.0249	
8/20/2013	COB	HS2	Wilma	FN081712-01	0.0250	0.024
8/20/2013	COB	HS2	Wilma	FN081712-01	0.0249	
8/20/2013	COB	HS2	Wilma	FN081712-01	0.0253	0.025
8/30/2013	COB	HS2	Wilma	FN081712-01	0.0257	
8/30/2013	COB	HS2	Wilma	FN081712-01	0.0258	0.025
8/30/2013	COB	HS2	Wilma	FN081712-01	0.0256	
8/30/2013	COB	HS2	Wilma	FN081712-01	0.0259	0.025
9/20/2013	bmb	HS2	Wilma	FN081712-01	0.0251	
9/20/2013	bmb	HS2	Wilma	FN081712-01	0.0258	0.025
9/20/2013	bmb	HS2	Wilma	FN081712-01	0.0253	
9/20/2013	bmb	HS2	Wilma	FN081712-01	0.0256	0.025
9/23/2013	CRF	HS1	Wilma	FN081712-01	0.0261	
9/23/2013	CRF	HS1	Wilma	FN081712-01	0.0259	0.026
9/23/2013	CRF	HS1	Wilma	FN081712-01	0.0261	
9/23/2013	CRF	HS1	Wilma	FN081712-01	0.0259	0.026
9/26/2013	COB	HS1	Wilma	FN081712-01	0.0256	
9/26/2013	COB	HS1	Wilma	FN081712-01	0.0262	0.025
9/26/2013	COB	HS1	Wilma	FN081712-01	0.0262	
9/26/2013	COB	HS1	Wilma	FN081712-01	0.0263	0.026
10/11/2013	CRF	HS2	Wilma	FN081712-01	0.0258	
10/11/2013	CRF	HS2	Wilma	FN081712-01	0.0258	0.025
10/11/2013	CRF	HS2	Wilma	FN081712-01	0.0254	
10/11/2013	CRF	HS2	Wilma	FN081712-01	0.0261	0.025
10/22/2013	CRF	HS1	Wilma	FN081712-01	0.0259	
10/22/2013	CRF	HS1	Wilma	FN081712-01	0.0257	0.025
10/22/2013	CRF	HS1	Wilma	FN081712-01	0.0262	
10/22/2013	CRF	HS1	Wilma	FN081712-01	0.0259	0.026
10/30/2013	bmb	HS1	Wilma	FN081712-01	0.0260	
10/30/2013	bmb	HS1	Wilma	FN081712-01	0.0257	0.025
10/30/2013	bmb	HS1	Wilma	FN081712-01	0.0259	
10/30/2013	bmb	HS1	Wilma	FN081712-01	0.0259	0.025
11/4/2013	COB	HS1	Wilma	FN081712-01	0.0248	
11/4/2013	COB	HS1	Wilma	FN081712-01	0.0251	0.024
11/4/2013	COB	HS1	Wilma	FN081712-01	0.0247	
11/4/2013	COB	HS1	Wilma	FN081712-01	0.0251	0.024
11/12/2013	CRF	HS1	Wilma	FN081712-01	0.0258	
11/12/2013	CRF	HS1	Wilma	FN081712-01	0.0260	0.025
11/12/2013	CRF	HS1	Wilma	FN081712-01	0.0256	
11/12/2013	CRF	HS1	Wilma	FN081712-01	0.0258	0.025
11/19/2013	CRF	HS1	Wilma	FN081712-01	0.0253	
11/19/2013	CRF	HS1	Wilma	FN081712-01	0.0257	0.025
11/19/2013	CRF	HS1	Wilma	FN081712-01	0.0251	
11/19/2013	CRF	HS1	Wilma	FN081712-01	0.0250	0.025
11/13/2013	bmb	HS2	Wilma	FN081712-01	0.0253	
11/13/2013	bmb	HS2	Wilma	FN081712-01	0.0259	0.025

11/15/2013	bmb	HS1	Wilma	FN081712-01	0.0251	
11/15/2013	bmb	HS1	Wilma	FN081712-01	0.0254	0.025
11/15/2013	bmb	HS1	Wilma	FN081712-01	0.0257	
11/15/2013	bmb	HS1	Wilma	FN081712-01	0.0257	0.025
12/3/2013	COB	HS1	ML600-1	FN081712-01	0.0257	
12/3/2013	COB	HS1	ML600-1	FN081712-01	0.0257	0.025
12/3/2013	COB	HS1	ML600-1	FN081712-01	0.0258	
12/3/2013	COB	HS1	ML600-1	FN081712-01	0.0260	0.025
12/17/2013	COB	HS1	ML600-1	FN081712-01	0.0258	
12/17/2013	COB	HS1	ML600-1	FN081712-01	0.0263	0.026
12/17/2013	COB	HS1	ML600-1	FN081712-01	0.0265	
12/17/2013	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
1/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0256	
1/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0260	0.025
1/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0255	
1/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0261	0.025
1/8/2014	bmb	HS2	ML600-1	FN081712-01	0.0260	
1/8/2014	bmb	HS2	ML600-1	FN081712-01	0.0257	0.025
1/8/2014	bmb	HS2	ML600-1	FN081712-01	0.0258	
1/8/2014	bmb	HS2	ML600-1	FN081712-01	0.0258	0.025
1/13/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
1/13/2014	COB	HS1	ML600-1	FN081712-01	0.0262	0.026
1/13/2014	COB	HS1	ML600-1	FN081712-01	0.0264	
1/13/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
1/23/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
1/23/2014	COB	HS1	ML600-1	FN081712-01	0.0260	0.025
1/23/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
1/23/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
1/23/2014	COB	HS2	ML600-1	FN081712-01	0.0257	
1/23/2014	COB	HS2	ML600-1	FN081712-01	0.0259	0.025
1/23/2014	COB	HS2	ML600-1	FN081712-01	0.0260	
1/23/2014	COB	HS2	ML600-1	FN081712-01	0.0262	0.026
2/3/2014	COB	HS1	ML600-1	FN081712-01	0.0267	
2/3/2014	COB	HS1	ML600-1	FN081712-01	0.0268	0.026
2/3/2014	COB	HS1	ML600-1	FN081712-01	0.0268	
2/3/2014	COB	HS1	ML600-1	FN081712-01	0.0265	0.026
2/14/2014	BMB	HS1	ML600-1	FN081712-01	0.0261	
2/14/2014	BMB	HS1	ML600-1	FN081712-01	0.0260	0.026
2/14/2014	BMB	HS1	ML600-1	FN081712-01	0.0258	
2/14/2014	BMB	HS1	ML600-1	FN081712-01	0.0256	0.025
2/24/2014	COB	HS1	ML600-1	FN081712-01	0.0254	
2/24/2014	COB	HS1	ML600-1	FN081712-01	0.0253	0.025
2/24/2014	COB	HS1	ML600-1	FN081712-01	0.0262	
2/24/2014	COB	HS1	ML600-1	FN081712-01	0.0256	0.025
3/3/2014	COB	HS1	ML600-1	FN081712-01	0.0260	
3/3/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
3/3/2014	COB	HS1	ML600-1	FN081712-01	0.0265	
3/3/2014	COB	HS1	ML600-1	FN081712-01	0.0260	0.026
3/11/2014	CRF	HS1	ML600-1	FN081712-01	0.0261	
3/11/2014	CRF	HS1	ML600-1	FN081712-01	0.0261	0.026
3/11/2014	CRF	HS1	ML600-1	FN081712-01	0.0266	
3/11/2014	CRF	HS1	ML600-1	FN081712-01	0.0264	0.026
3/11/2014	BMB	HS2	ML600-1	FN081712-01	0.0257	
3/11/2014	BMB	HS2	ML600-1	FN081712-01	0.0259	0.025
3/11/2014	BMB	HS2	ML600-1	FN081712-01	0.0259	
3/11/2014	BMB	HS2	ML600-1	FN081712-01	0.0256	0.025
4/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0260	
4/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0264	0.026
4/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0263	
4/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0266	0.026
4/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0253	
4/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0255	0.025
4/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0259	
4/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0260	0.025
4/22/2014	COB	HS2	ML600-1	FN081712-01	0.0255	
4/22/2014	COB	HS2	ML600-1	FN081712-01	0.0254	0.025
4/22/2014	COB	HS2	ML600-1	FN081712-01	0.0258	
4/22/2014	COB	HS2	ML600-1	FN081712-01	0.0261	0.025
4/24/2014	COB	HS2	ML600-1	FN081712-01	0.0255	
4/24/2014	COB	HS2	ML600-1	FN081712-01	0.0258	0.025
4/24/2014	COB	HS2	ML600-1	FN081712-01	0.0257	

4/24/2014	COB	HS2	ML600-1	FN081712-01	0.0257	0.025
4/30/2014	COB	HS1	ML600-1	FN081712-01	0.0265	
4/30/2014	COB	HS1	ML600-1	FN081712-01	0.0263	0.026
4/30/2014	COB	HS1	ML600-1	FN081712-01	0.0266	
4/30/2014	COB	HS1	ML600-1	FN081712-01	0.0263	0.026
4/30/2014	CRF	HS2	ML600-1	FN081712-01	0.0254	
4/30/2014	CRF	HS2	ML600-1	FN081712-01	0.0258	0.025
4/30/2014	CRF	HS2	ML600-1	FN081712-01	0.0261	
4/30/2014	CRF	HS2	ML600-1	FN081712-01	0.0262	0.026
5/6/2014	bmb	HS1	ML600-1	FN081712-01	0.0254	
5/6/2014	bmb	HS1	ML600-1	FN081712-01	0.0254	0.025
5/6/2014	bmb	HS1	ML600-1	FN081712-01	0.0255	
5/6/2014	bmb	HS1	ML600-1	FN081712-01	0.0257	0.025
5/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0261	
5/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0265	0.026
5/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0261	
5/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0268	0.026
5/12/2014	bmb	HS2	ML600-1	FN081712-01	0.0258	
5/12/2014	bmb	HS2	ML600-1	FN081712-01	0.0262	0.026
5/12/2014	bmb	HS2	ML600-1	FN081712-01	0.0262	
5/12/2014	bmb	HS2	ML600-1	FN081712-01	0.0263	0.026
5/19/2014	COB	HS1	ML600-1	FN081712-01	0.0267	
5/19/2014	COB	HS1	ML600-1	FN081712-01	0.0271	0.026
5/19/2014	COB	HS1	ML600-1	FN081712-01	0.0264	
5/19/2014	COB	HS1	ML600-1	FN081712-01	0.0264	0.026
5/20/2014	COB	HS1	ML600-1	FN081712-01	0.0265	
5/20/2014	COB	HS1	ML600-1	FN081712-01	0.0273	0.026
5/20/2014	COB	HS1	ML600-1	FN081712-01	0.0267	
5/20/2014	COB	HS1	ML600-1	FN081712-01	0.0267	0.026
5/21/2014	COB	HS1	ML600-1	FN081712-01	0.0263	
5/21/2014	COB	HS1	ML600-1	FN081712-01	0.0264	0.026
5/21/2014	COB	HS1	ML600-1	FN081712-01	0.0273	
5/21/2014	COB	HS1	ML600-1	FN081712-01	0.0266	0.026
5/21/2014	COB	HS2	ML600-1	FN081712-01	0.0264	
5/21/2014	COB	HS2	ML600-1	FN081712-01	0.0265	0.026
5/21/2014	COB	HS2	ML600-1	FN081712-01	0.0265	
5/21/2014	COB	HS2	ML600-1	FN081712-01	0.0265	0.026
5/27/2014	bmb	hs2	ML600-1	FN081712-01	0.0259	
5/27/2014	bmb	hs2	ML600-1	FN081712-01	0.0258	0.025
5/27/2014	bmb	hs2	ML600-1	FN081712-01	0.026	
5/27/2014	bmb	hs2	ML600-1	FN081712-01	0.0262	0.026
6/3/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
6/3/2014	COB	HS1	ML600-1	FN081712-01	0.0258	0.025
6/3/2014	COB	HS1	ML600-1	FN081712-01	0.0260	
6/3/2014	COB	HS1	ML600-1	FN081712-01	0.0259	0.025
6/3/2014	BMB	HS2	ML600-1	FN081712-01	0.026	
6/3/2014	BMB	HS2	ML600-1	FN081712-01	0.0261	
6/3/2014	BMB	HS2	ML600-1	FN081712-01	0.0264	
6/3/2014	BMB	HS2	ML600-1	FN081712-01	0.0261	
6/4/2014	bmb	HS1	ML600-1	FN081712-01	0.0254	
6/4/2014	bmb	HS1	ML600-1	FN081712-01	0.0256	0.025
6/4/2014	bmb	HS1	ML600-1	FN081712-01	0.026	
6/4/2014	bmb	HS1	ML600-1	FN081712-01	0.0261	0.026
6/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0259	
6/10/2014	CRF	HS1	ML600-1	FN081712-01	0.026	0.025
6/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0265	
6/10/2014	CRF	HS1	ML600-1	FN081712-01	0.0265	0.026
6/17/2014	COB	HS1	ML600-1	FN081712-01	0.0246	
6/17/2014	COB	HS1	ML600-1	FN081712-01	0.0252	0.024
6/17/2014	COB	HS1	ML600-1	FN081712-01	0.0248	
6/17/2014	COB	HS1	ML600-1	FN081712-01	0.0249	0.024
6/24/2014	CRF	HS1	ML600-1	FN081712-01	0.0263	
6/24/2014	CRF	HS1	ML600-1	FN081712-01	0.026	0.026
6/24/2014	CRF	HS1	ML600-1	FN081712-01	0.0262	
6/24/2014	CRF	HS1	ML600-1	FN081712-01	0.0262	0.026
7/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0263	
7/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0265	0.026
7/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0266	
7/2/2014	CRF	HS1	ML600-1	FN081712-01	0.0265	0.026
7/11/2014	bmb	HS1	ML600-1	FN081712-01	0.0258	
7/11/2014	bmb	HS1	ML600-1	FN081712-01	0.0256	0.025

7/11/2014	bmb	HS1	ML600-1	FN081712-01	0.0259	
7/11/2014	bmb	HS1	ML600-1	FN081712-01	0.0259	0.025
7/14/2014	COB	HS1	ML600-1	FN081712-01	0.0262	
7/14/2014	COB	HS1	ML600-1	FN081712-01	0.0266	0.026
7/14/2014	COB	HS1	ML600-1	FN081712-01	0.0265	
7/14/2014	COB	HS1	ML600-1	FN081712-01	0.0268	0.026
7/22/2014	COB	HS1	ML600-1	FN081712-01	0.0258	
7/22/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.025
7/22/2014	COB	HS1	ML600-1	FN081712-01	0.0256	
7/22/2014	COB	HS1	ML600-1	FN081712-01	0.0259	0.025
7/29/2014	COB	HS1	ML600-1	FN081712-01	0.0261	
7/29/2014	COB	HS1	ML600-1	FN081712-01	0.0265	0.026
7/29/2014	COB	HS1	ML600-1	FN081712-01	0.0266	
7/29/2014	COB	HS1	ML600-1	FN081712-01	0.0267	0.026
8/4/2014	COB	HS1	ML600-1	FN081712-01	0.026	
8/4/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
8/4/2014	COB	HS1	ML600-1	FN081712-01	0.0264	
8/4/2014	COB	HS1	ML600-1	FN081712-01	0.0262	0.026
8/5/2014	COB	HS1	ML600-1	FN081712-01	0.0257	
8/5/2014	COB	HS1	ML600-1	FN081712-01	0.0257	0.025
8/5/2014	COB	HS1	ML600-1	FN081712-01	0.0258	
8/5/2014	COB	HS1	ML600-1	FN081712-01	0.0256	0.025
8/11/2014	COB	HS1	ML600-1	FN081712-01	0.0268	
8/11/2014	COB	HS1	ML600-1	FN081712-01	0.0272	
8/11/2014	COB	HS1	ML600-1	FN081712-01	0.0271	
8/11/2014	COB	HS1	ML600-1	FN081712-01	0.0271	
8/12/2014	COB	HS1	ML600-1	FN081712-01	0.026	
8/12/2014	COB	HS1	ML600-1	FN081712-01	0.0257	0.025
8/12/2014	COB	HS1	ML600-1	FN081712-01	0.0261	
8/12/2014	COB	HS1	ML600-1	FN081712-01	0.0258	0.025
8/25/2014	COB	HS1	ML600-1	FN081712-01	0.0261	
8/25/2014	COB	HS1	ML600-1	FN081712-01	0.0262	0.026
8/25/2014	COB	HS1	ML600-1	FN081712-01	0.0262	
8/25/2014	COB	HS1	ML600-1	FN081712-01	0.0263	0.026
8/29/2014	COB	HS1	ML600-1	FN081712-01	0.026	
8/29/2014	COB	HS1	ML600-1	FN081712-01	0.026	0.026
8/29/2014	COB	HS1	ML600-1	FN081712-01	0.0261	
8/29/2014	COB	HS1	ML600-1	FN081712-01	0.026	0.026
9/9/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
9/9/2014	COB	HS1	ML600-1	FN081712-01	0.0259	0.025
9/9/2014	COB	HS1	ML600-1	FN081712-01	0.0262	
9/9/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.026
9/15/2014	bmb	HS1	ML600-1	FN081712-01	0.0266	
9/15/2014	bmb	HS1	ML600-1	FN081712-01	0.0265	0.026
9/15/2014	bmb	HS1	ML600-1	FN081712-01	0.0265	
9/15/2014	bmb	HS1	ML600-1	FN081712-01	0.027	0.026
9/23/2014	COB	HS1	ML600-1	FN081712-01	0.0256	
9/23/2014	COB	HS1	ML600-1	FN081712-01	0.0261	0.025
9/23/2014	COB	HS1	ML600-1	FN081712-01	0.0255	
9/23/2014	COB	HS1	ML600-1	FN081712-01	0.0257	0.025
9/29/2014	COB	HS1	ML600-1	FN081712-01	0.0253	
9/29/2014	COB	HS1	ML600-1	FN081712-01	0.0251	0.025
9/29/2014	COB	HS1	ML600-1	FN081712-01	0.0255	
9/29/2014	COB	HS1	ML600-1	FN081712-01	0.0254	0.025
10/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0254	
10/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0255	0.025
10/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0252	
10/7/2014	bmb	HS1	ML600-1	FN081712-01	0.0256	0.025
10/13/2014	CRF	HS2	ML600-1	FN081712-01	0.0256	
10/13/2014	CRF	HS2	ML600-1	FN081712-01	0.0259	0.025
10/13/2014	CRF	HS2	ML600-1	FN081712-01	0.0259	
10/13/2014	CRF	HS2	ML600-1	FN081712-01	0.0261	0.026
10/20/2014	COB	HS1	ML600-1	FN081712-01	0.0259	
10/20/2014	COB	HS1	ML600-1	FN081712-01	0.0257	0.025
10/20/2014	COB	HS1	ML600-1	FN081712-01	0.0257	
10/20/2014	COB	HS1	ML600-1	FN081712-01	0.0263	0.026
10/27/2014	COB	HS2	ML600-1	FN081712-01	0.0242	
10/27/2014	COB	HS2	ML600-1	FN081712-01	0.0238	0.024
10/27/2014	COB	HS2	ML600-1	FN081712-01	0.024	
10/27/2014	COB	HS2	ML600-1	FN081712-01	0.0245	0.024
11/3/2014	CRF	HS2	ML600-1	FN081712-01	0.0259	

11/3/2014	CRF	HS2	ML600-1	FN081712-01	0.0258	0.025
11/3/2014	CRF	HS2	ML600-1	FN081712-01	0.0259	
11/3/2014	CRF	HS2	ML600-1	FN081712-01	0.026	0.025
11/12/2014	bmb	HS1	ML600-1	FN081712-01	0.0257	
11/12/2014	bmb	HS1	ML600-1	FN081712-01	0.0253	0.025
11/12/2014	bmb	HS1	ML600-1	FN081712-01	0.025	
11/12/2014	bmb	HS1	ML600-1	FN081712-01	0.0254	0.025
11/20/2014	COB	HS2	ML600-1	FN081712-01	0.0259	
11/20/2014	COB	HS2	ML600-1	FN081712-01	0.0258	0.025
11/20/2014	COB	HS2	ML600-1	FN081712-01	0.0258	
11/20/2014	COB	HS2	ML600-1	FN081712-01	0.026	0.025
12/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0261	
12/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0265	0.026
12/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0263	
12/2/2014	CRF	HS2	ML600-1	FN081712-01	0.0262	0.026
12/8/2014	COB	HS2	ML600-1	FN081712-01	0.0266	
12/8/2014	COB	HS2	ML600-1	FN081712-01	0.0268	0.026
12/8/2014	COB	HS2	ML600-1	FN081712-01	0.027	
12/8/2014	COB	HS2	ML600-1	FN081712-01	0.0268	0.026