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A semi-automated instrument for cellular oxidative potential evaluation (SCOPE) of water-soluble extracts of ambient particulate matter

Sudheer Salana et al.

Correspondence to: Vishal Verma (vverma@illinois.edu)

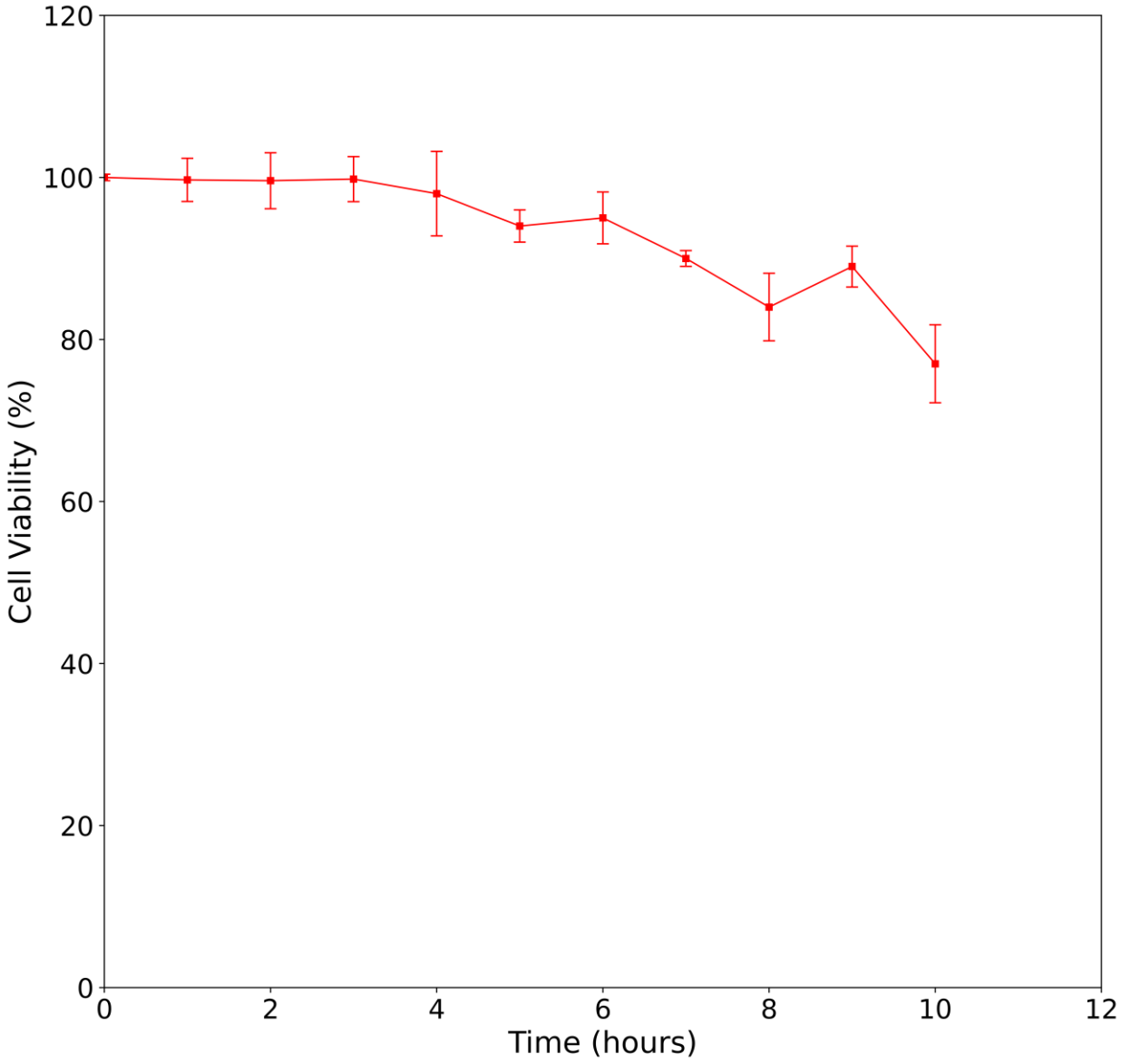

Figure S1: Variation in cell viability [(viable cells/total cells) *100] for NR8383 cells suspended in 1XSGM at 37 ºC (outside an incubator) as a function of time. Cell Viability was measured using Trypan Blue Assay. 100 µL of 0.4% trypan blue solution was mixed with 100 µL of cells and incubated for 3 minutes at room temperature. After incubation, 10 µL of the mixture was withdrawn, applied to a hemocytometer and viable cells (unstained) were counted under a microscope. Error bars denote one standard deviation of the mean (N= 3 replicates).

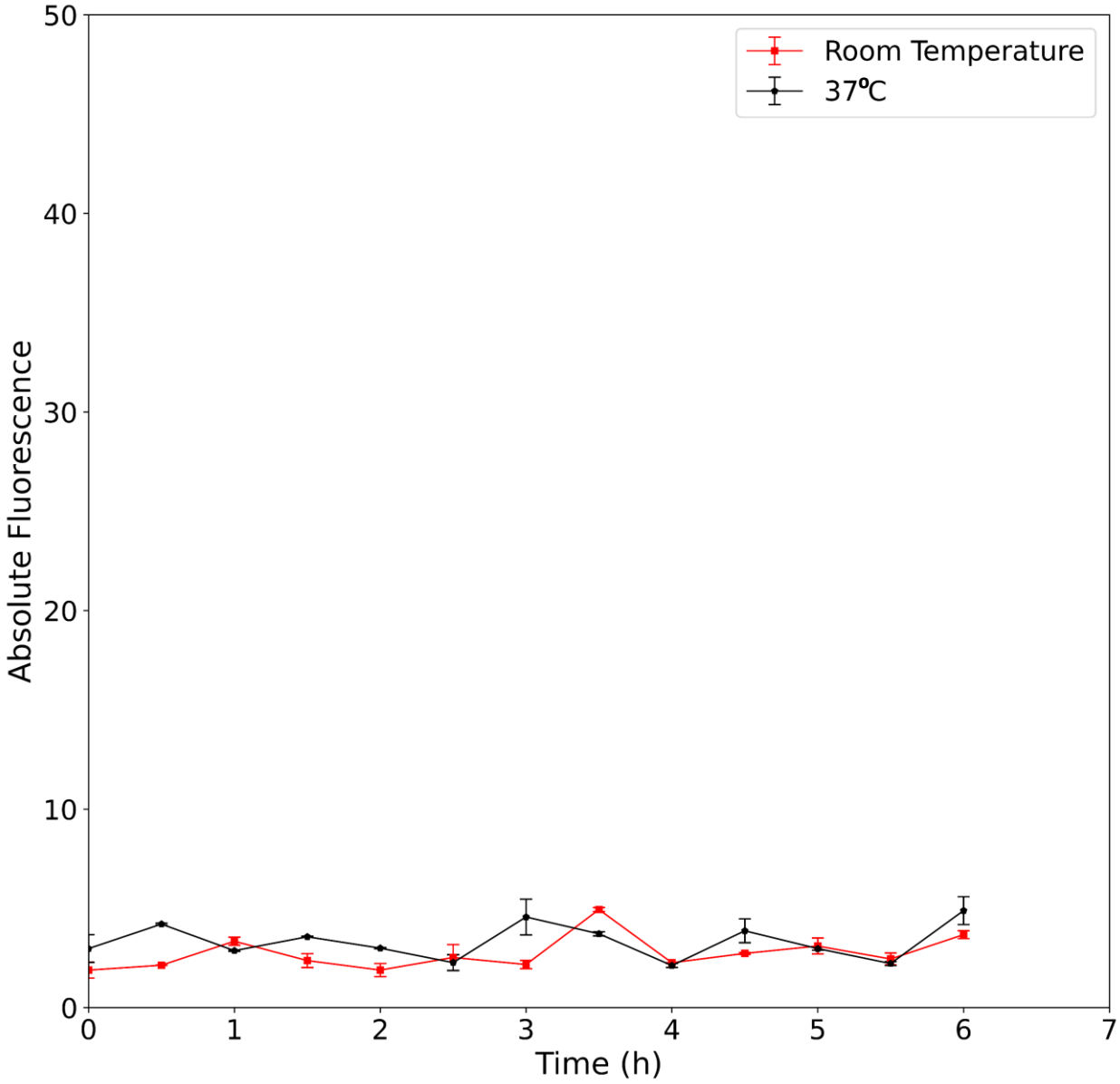

Figure S2: Variation in the absolute fluorescence of DCFH-DA as a function of time. DCFH-DA was prepared as discussed in Section 2.2 of the manuscript and transferred to two different amber vials. One of these vials was stored in the thermomixer at 37 ºC and the other vial was stored at room temperature (23 ºC). Change in fluorescence of DCFH-DA in each vial was measured every 30 minutes, for a period of up to 6 hours. Error bars denote one standard deviation of the mean (N=3 replicates).

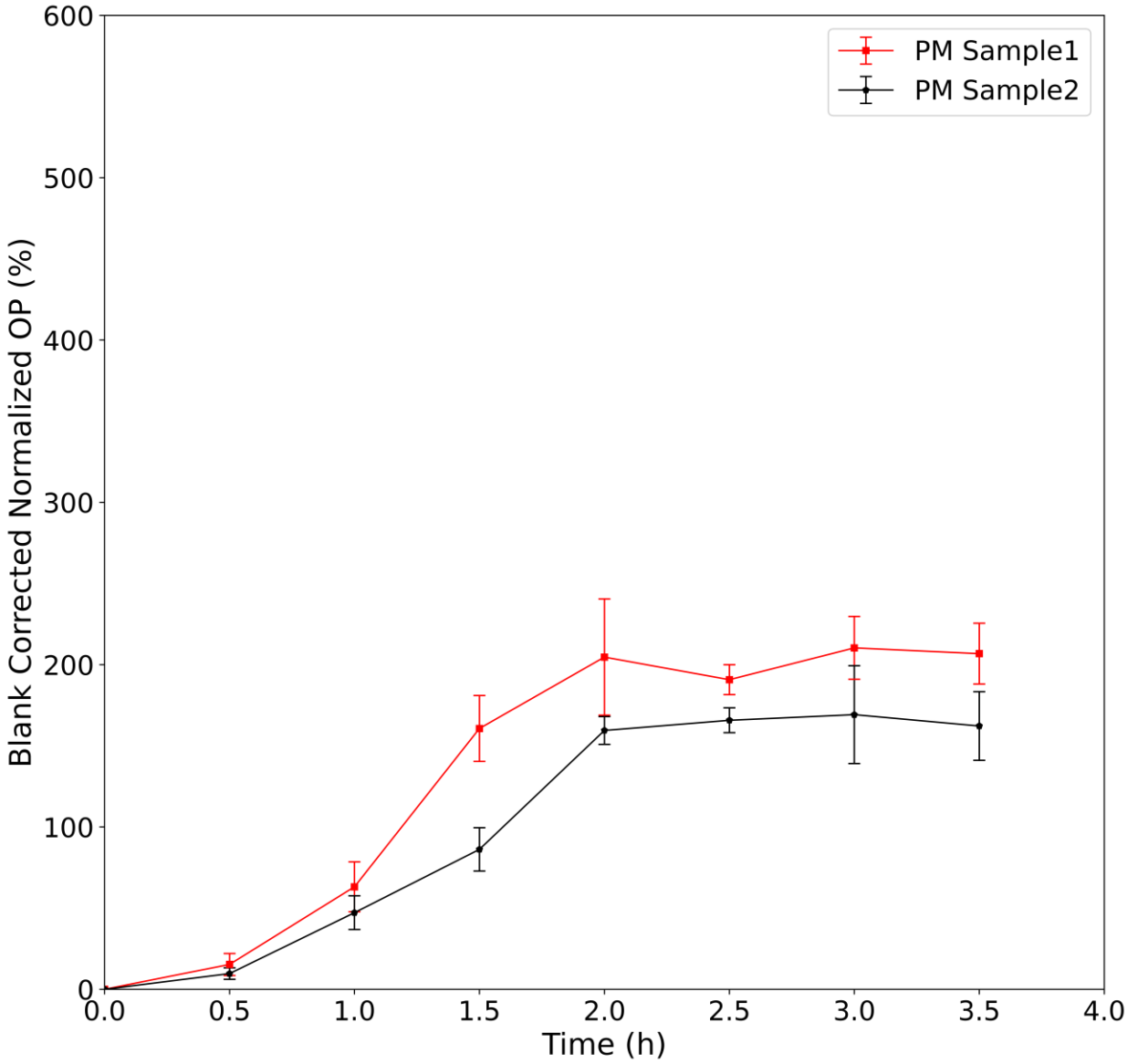

Figure S3: Effect of incubation time on the OP of PM samples. Each measurement was performed in triplicates. Error bars denote one standard deviation of the mean.

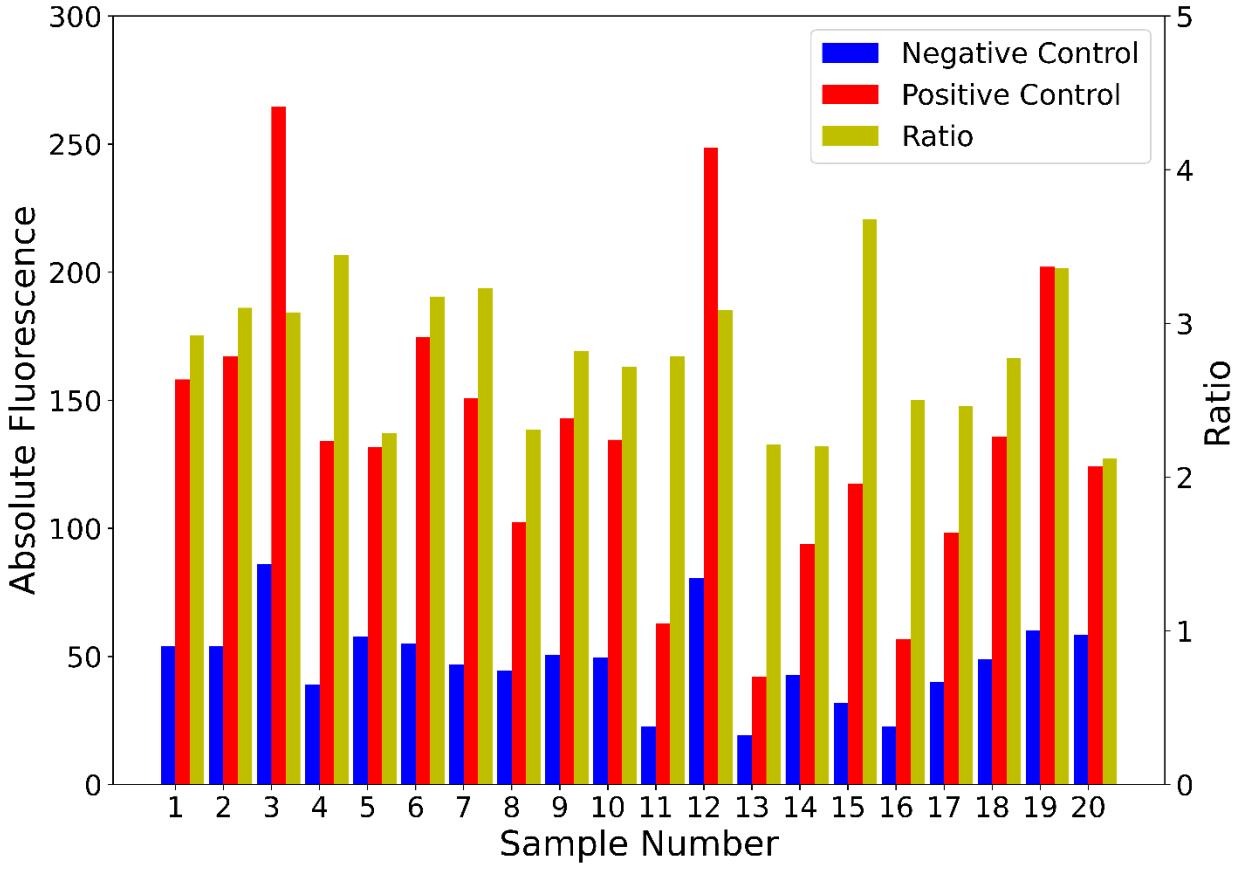

Figure S4: Absolute fluorescence of negative (DI) and positive (Zymosan's concentration= 100µg/mL) control measured manually on 20 different days

Section S1: Calculation of cellular ROS activity of the samples

For PM samples

Blank correction = z% - 117.45% (average of field blank response w.r.t to Milli-Q) = p%

Normalization with PM mass in the reaction vial (RV) = p%/30 (µg/mL) = k%

Unit conversion of k from (µg/mL to mg/mL) = k% x 1000 = n%

Conversion of n into equivalent units of t-BOOH = ((n +4.70)/4.18) mg equivalents of t-BOOH/mg of PM

For positive controls and standard solutions:

Fluorescence of the Negative Control = x

Sample fluorescence = y

Ratio of sample fluorescence to negative control fluorescence = (x/y) *100 = z%

Blank correction = z% -100% = m%

Conversion of m into equivalent units of t-BOOH = ((m +4.70)/4.18) mg/mL of t-BOOH (from the calibration curve)

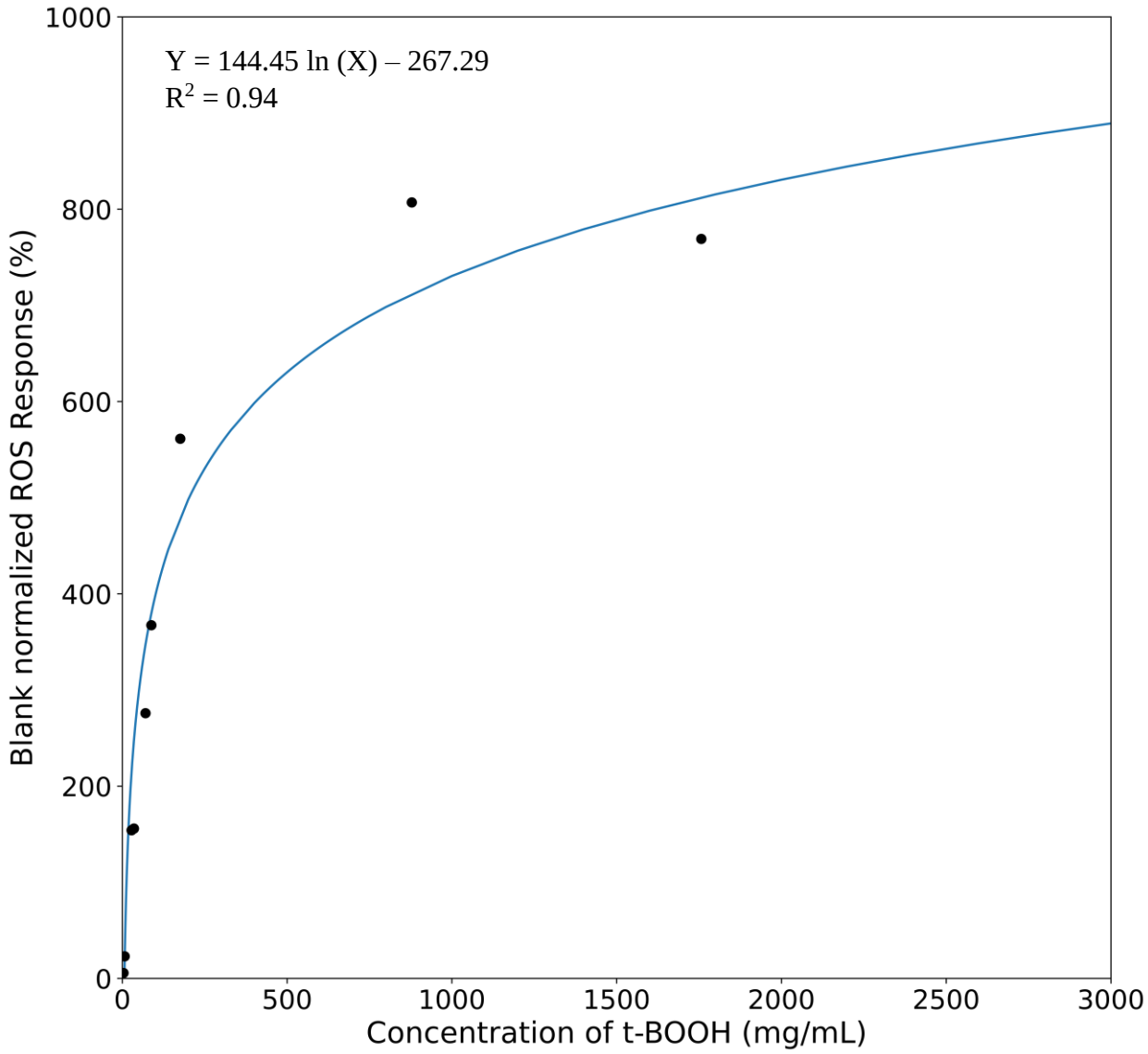

Figure S5: Calibration curve for t-BOOH (concentrations used = 3.51 -1756.78 mg/ml)

Table S1: Detail of the filter samples (dates of collection, filter mass loading) used for assessing for accuracy and precision of the instrument

Sampling Site	Sampling Date (Start-End Date)	Filter Mass Loading (mg)
Bondville	6/12/2018 -6/15/2018	45.8
	09/04/2018-09/07/2018	34.8
	12/11/2018-12/14/2018	65.1
	12/18/2018-12/21/2018	60.2
	03/19/2019-03/22/2019	58.9
	05/14/2019-05/17/2019	47.2
	05/21/2019-05/24/2019	34.5
Chicago	05/22/2018-05/25/2018	41
	05/29/2018-06/01/2018	54
	06/5/2018-06/08/2018	48.8
	06/12/2018 -06/15/2018	45.8
	06/26/2018-06/29/2018	58.7
	07/10/2018-07/13/2018	56.3
	10/9/2018-10/12/2018	32
	10/16/2018-10/19/2018	60.7
	10/23/2018-10/26/2018	42.4
	02/05/2019-02/08/2019	46.4
Champaign	05/22/2018-05/25/2018	75.3
	05/29/2018-06/01/2018	50.6
	07/03/2018-07/06/2018	39.8
	07/10/2018-07/13/2018	64.4
	07/24/2018-07/27/2018	62.9
	07/31/2018-08/03/2018	56.5
	08/07/2018-08/10/2018	63.3
	08/21/2018-08/24/2018	75.3
	08/28/2018-08/31/2018	35.4
	09/04/2018-09/07/2018	69.3
	10/09/2018-10/12/2018	24.7
	10/23/2018-10/26/2018	45.7
	04/23/2019-04/26/2019	69.8
	05/28/2019-05/31/2019	38.7
Indianapolis	6/19/2018-06/22/2018	43
	6/26/2018-06/29/2018	33.1
	8/7/2018-08/11/2018	33
	8/28/2018-08/31/2018	47.6
	10/23/2018-10/26/2018	50.1

	1/15/2019-1/18/2019	56.8
	1/22/2019-1/25/2019	53.5
	5/21/2019-5/24/2019	45.6
	5/22/2019-5/25/2019	62.7
St Louis	6/19/2018-6/22/2018	58.1
	6/26/2018-6/29/2018	50.9
	7/31/2018-08/03/2018	70.4
	8/28/2018-8/31/2018	44.8
	10/23/2018-10/26/2018	64.4
	10/30/2018-11/02/2018*	39.3
	1/15/2019-1/18/2019	60.2
	2/05/2019-2/08/2019	46.4
	4/2/2019-4/5/2019	74
	4/23/2019-4/26/2019	45

*PM Sample used for precision.