Spokane Regional Clean Air Agency
Air Quality Report – August 2021

Wildfire smoke continued to plague the region in August, resulting in the highest $PM_{2.5}$ readings so far this year in the Spokane area. The Air Quality Index (AQI) was in the UNHEALTHY (red) category on six days in August (August 1-3 and 12-14, Figure 1). There were fourteen MODERATE air quality days and eleven GOOD air quality days in August (Table 1). The maximum daily AQI for the month of 183 ($PM_{2.5}$ 24-hour average mass concentration = 117.7 µg/m^3), recorded at the Broadway air monitoring station near the intersection of Broadway & Glenn in Spokane Valley (Figure 2 and Tables 2 and 3). Figure 3 shows the day-to-day variation in ground-level ozone readings in Spokane County.

See Appendix 1 of this report for information about federal air quality standards and Appendix 2 for a description of the AQI. The daily air quality data for August for all monitoring stations in the Spokane region are provided in Appendix 3. Current and historical air quality data can be obtained electronically from the Washington State Department of Ecology's air monitoring data website, https://enviwa.ecology.wa.gov/home/map.

Figure 1: Air Quality Index (AQI) values for August 2021. The data represent the maximum AQI values across all monitoring stations within Spokane County.

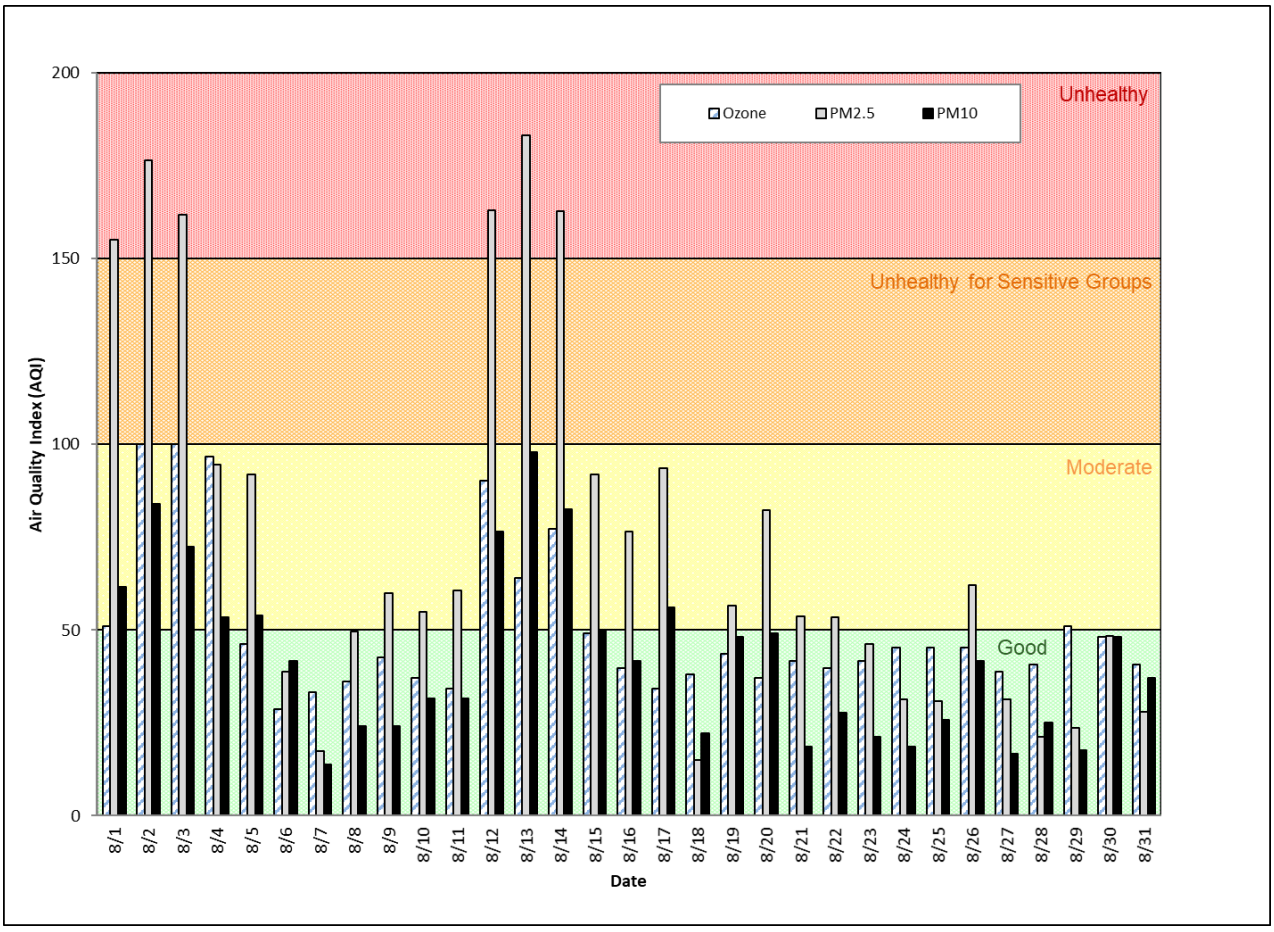

Figure 2: Multi-station 24-hour average $PM_{2.5}$ for August 2021; Spokane County.

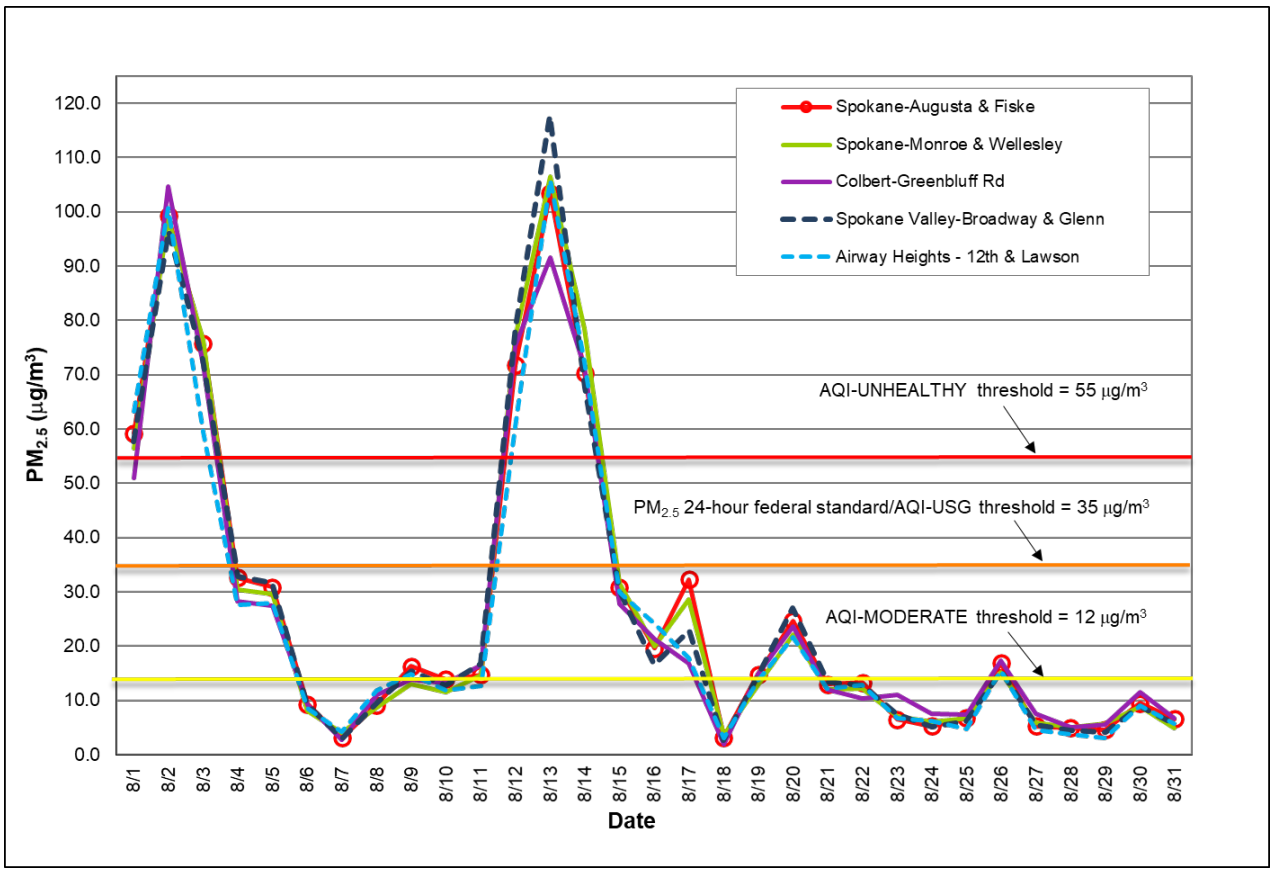

Figure 3: Eight-hour maximum ozone concentrations for the Spokane region in August. The threshold for the moderate category of the AQI for ozone is 0.055 ppm averaged over eight hours. An ozone measurement above 0.070 ppm, averaged over eight hours, is the level of the federal ozone standard.

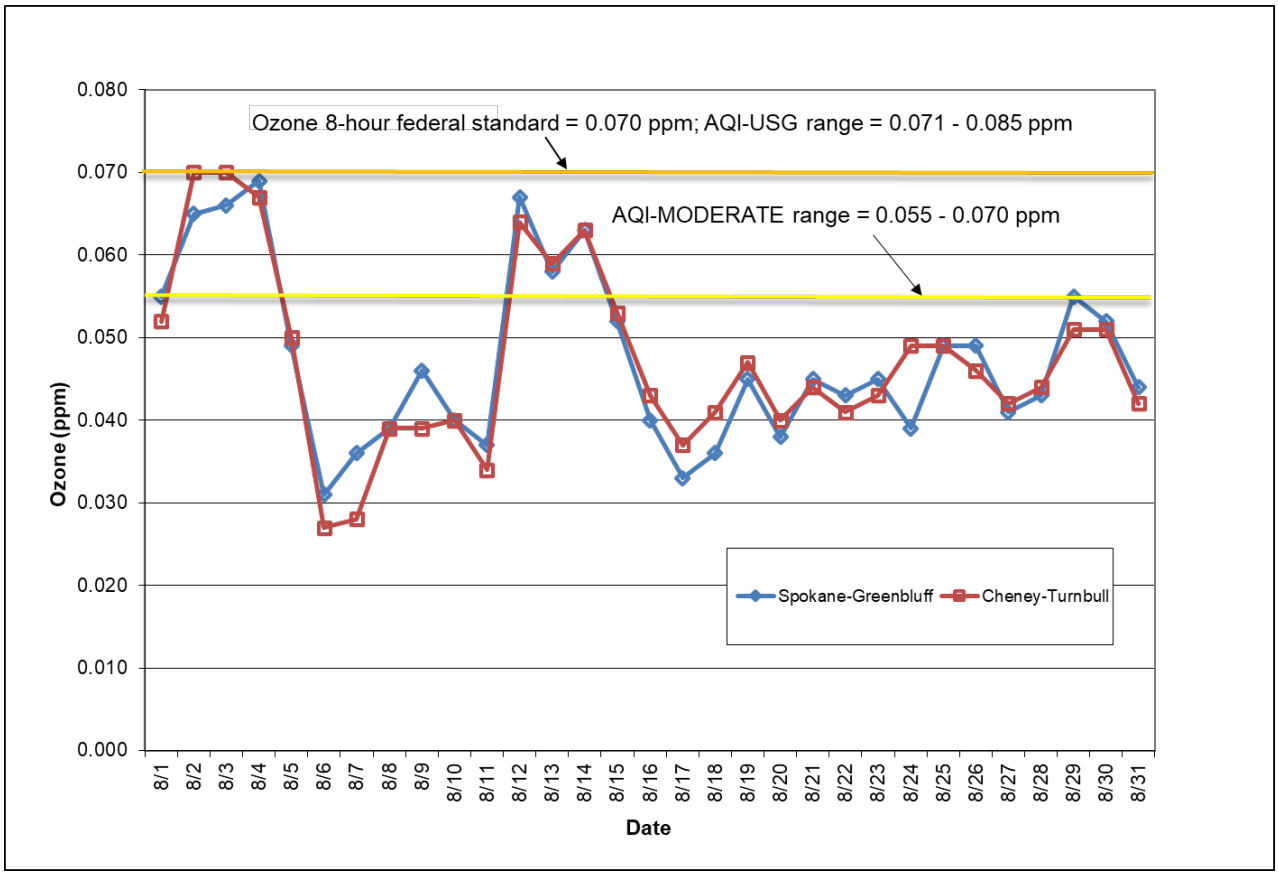

Table 1 summarizes the daily AQIs by category for the month and year-to-date and Tables 2 and 3 contain the maximum AQI values for each pollutant for the month and for the year-to-date, respectively.

Table 1: AQI summary as of August 31, 2021

Category	Number of days in August	Number of days this year to date
Good (0-50)	11	179
Moderate (51-100)	14	55
Unhealthy for Sensitive Groups (101-150)	0	3
Unhealthy (151-200)	6	6
Very Unhealthy (201-300)	0	0
Hazardous (>300)	0	0

Table 2: Maximum AQI values and pollutant concentrations for this reporting period.

Pollutant	AQI		Location	Date
O_3	100 (conc. = 0.070 ppm)	Moderate	Turnbull	8/2 and 8/3
PM_{10}	98 (conc. = 150 µg/m^3)	Moderate	Turnbull	8/13
$PM_{2.5}$	183 (conc. = 117.7 µg/m^3)	Unhealthy	Spokane Valley – Broadway & Glenn	8/13

Table 3: Maximum AQI values and pollutant concentrations for this year to date.

Pollutant	AQI		Location	Date
O_3	119 (conc. = 0.076 ppm)	USG	Greenbluff	7/13
PM_{10}	98 (conc. = 150 µg/m^3)	Moderate	Turnbull	8/13
$PM_{2.5}$	183 (conc. = 117.7 µg/m^3)	Unhealthy	Spokane Valley – Broadway & Glenn	8/13

Appendix 1 – National Ambient Air Quality Standards

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), ground-level ozone (O_3) and sulfur dioxide (SO_2; Table A-1). These are known as "criteria" pollutants because the US EPA established regulatory limits to concentrations in ambient air using human health or environmentally based criteria. Carbon monoxide, particulate matter and ozone are monitored in Spokane County by the Spokane Regional Clean Air Agency (SRCAA) and the Washington State Department of Ecology (Ecology).

Table A-1: National Ambient Air Quality Standards

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month period	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)), A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the require NAAQS.

Appendix 2 – Air Quality Index

The Air Quality Index (AQI) is EPA's color-coded tool for communicating daily air quality to the public and can be calculated for any of the criteria pollutants except lead, provided monitoring data are available. An index value above 100 indicates that the concentration of a criteria pollutant exceeded the limit established in the NAAQS. Categories of the AQI are "Good" (green, 0-50), "Moderate" (yellow, 51-100), "Unhealthy for Sensitive Groups" (USG; orange, 101-150), "Unhealthy" (red, 151-200), "Very Unhealthy" (purple, 201-300) and "Hazardous" (maroon, 301-500; Table A-2).

Table A-2: Air pollutant breakpoints for the Air Quality Index.

Air Quality Index Levels of Health Concern	Color Code	Index Numerical Value	Breakpoints				Health Effects
			O_3 (ppm) 8-hour	$PM_{2.5}$ (µg/m^3) 24-hour	PM_{10} (µg/m^3) 24-hour	CO (ppm) 8-hour	
Good	Green	0-50	0.000-0.054	0.0-12.0	0-54	0.0-4.4	Air quality is considered satisfactory and air pollution poses little or no risk.
Moderate	Yellow	51-100	0.055-0.070	12.1-35.4	55-154	4.5-9.4	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	Orange	101-150	0.071-0.085	35.5-55.4	155-254	9.5-12.4	People especially sensitive to air pollution may experience health effects. The general public is not likely to be affected. An AQI in this category or above indicates that air pollution exceeds levels acceptable under federal air quality standards.
Unhealthy	Red	151-200	0.086-0.105	55.5-150.4	255-354	12.5-15.4	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	Purple	201-300	0.106-0.200	150.5-250.4	355-424	15.5-30.4	Health alert: everyone may experience more serious health effects.
Hazardous	Maroon	>300	0.201 to the Significant Harm Level* (0.600 ppm, 2 hour average)	250.5+	425+	30.5+	Health warnings of emergency conditions. The entire population is more likely to be affected.

*The significant harm level (SHL) is set at a level that represents imminent and substantial endangerment to public health.

Appendix 3

Table A-3: Summary air quality data for August for air monitoring stations in Spokane County. Particulate matter mass concentration is reported as 24-hour averages in micrograms per cubic meter of air ($\mu g/m^3$) and daily 8-hour maximum ozone concentrations are reported in parts per million (ppm). See Appendix 2 for an explanation of AQI color codes.

Pollutant Concentration											
Date	Ozone - Turnbull NWR	Ozone - Greenbluff	$PM_{2.5}$ - Airway Heights (24 hour avg, $\mu g/m^3$)	$PM_{2.5}$ - Colbert (24 hour avg, $\mu g/m^3$)	$PM_{2.5}$ - Spokane, Augusta & Fiske (24 hour avg, $\mu g/m^3$)	$PM_{2.5}$ - Spokane Valley, Broadway & Glenn (24 hour avg, $\mu g/m^3$)	$PM_{2.5}$ - Spokane, Monroe & Wellesley (24 hour avg, $\mu g/m^3$)	PM_{10} - Turnbull NWR BAM (24 hour avg, $\mu g/m^3$)	PM_{10} - Spokane, Augusta & Fiske (24 hour avg, $\mu g/m^3$)	PM_{10} - Spokane, Broadway & Glenn (24 hour avg, $\mu g/m^3$)
8/1	0.052	0.055	63.2	50.9	59.2	57.6	56.5	50	77	75
8/2	0.070	0.065	100.7	104.6	99.2	96.4	98.7	73	122	112
8/3	0.070	0.066	59.5	71.9	75.8	72.7	76.4	57	99	91
8/4	0.067	0.069	27.6	28.2	32.6	32.8	30.4	38	61	53
8/5	0.050	0.049	28.0	27.5	30.9	31.6	29.6	43	62	52
8/6	0.027	0.031	8.5	9.2	9.3	9.3	8.0	24	45	36
8/7	0.028	0.036	4.2	2.8	3.1	3.0	4.0	13	15	13
8/8	0.039	0.039	11.9	11.1	9.2	9.5	8.7	15	26	19
8/9	0.039	0.046	14.9	13.8	16.3	15.4	13.0	12	26	23
8/10	0.040	0.040	11.9	13.1	13.9	12.8	11.5	23	34	24
8/11	0.034	0.037	12.7	16.5	14.7	16.7	14.7	25	34	29
8/12	0.064	0.067	60.4	75.4	71.7	78.9	76.9	107	99	100
8/13	0.059	0.058	105.9	91.6	103.5	117.7	106.5	150	133	144
8/14	0.063	0.063	72.3	71.4	70.3	67.7	78.5	119	95	88
8/15	0.053	0.052	30.0	27.7	30.9	30.4	31.5	54	46	43
8/16	0.043	0.040	24.2	21.3	19.6	16.5	19.9	34	45	37
8/17	0.037	0.033	17.9	16.8	32.3	22.8	28.6	50	66	56
8/18	0.041	0.036	3.0	1.9	3.2	2.7	3.6	24	10	9
8/19	0.047	0.045	13.6	14.8	14.8	14.7	12.8	52	39	29
8/20	0.040	0.038	21.7	23.7	24.7	27.0	22.1	41	53	45
8/21	0.044	0.045	12.2	12.1	13.0	13.4	12.1	20	19	17
8/22	0.041	0.043	12.8	10.3	13.3	12.7	12.2	30	30	26
8/23	0.043	0.045	6.7	11.1	6.5	7.4	7.0	23	23	17
8/24	0.049	0.039	6.3	7.5	5.3	5.2	6.0	19	20	13
8/25	0.049	0.049	4.8	7.4	6.8	6.1	6.8	28	24	18
8/26	0.046	0.049	15.5	17.4	16.9	15.5	15.2	45	43	38
8/27	0.042	0.041	4.5	7.5	5.3	5.5	5.9	18	17	14
8/28	0.044	0.043	3.8	5.1	4.9	4.5	5.1	27	14	11
8/29	0.051	0.055	3.0	5.6	4.6	4.2	5.7	19	17	15
8/30	0.051	0.052	9.1	11.6	9.5	8.9	8.8	48	52	43
8/31	0.042	0.044	5.7	6.7	6.6	5.6	4.9	28	40	33
AVG	0.047	0.047	25.0	25.7	26.7	26.6	26.5	42	48	43
MAX	0.070	0.069	105.9	104.6	103.5	117.7	106.5	150	133	144

Air Quality Index (AQI)											
Date	Ozone - Turnbull NWR	Ozone - Greenbluff	$PM_{2.5}$ - Airway Heights	$PM_{2.5}$ - Colbert	$PM_{2.5}$ - Spokane - Augusta & Fiske	$PM_{2.5}$ - Broadway & Glenn	$PM_{2.5}$ - Monroe & Wellesley	PM_{10} - Turnbull NWR	PM_{10} - Augusta & Fiske	PM_{10} - Broadway & Glenn	MAXIMUM
8/1	48	51	155	139	153	152	152	46	62	61	155
8/2	100	84	174	176	174	172	173	60	84	79	176
8/3	100	87	153	159	161	160	162	52	73	69	162
8/4	90	97	84	85	94	95	89	35	54	49	97
8/5	46	45	84	83	91	92	88	40	54	48	92
8/6	25	29	35	38	39	39	33	22	42	33	42
8/7	26	33	18	12	13	13	17	12	14	12	33
8/8	36	36	50	46	38	40	36	14	24	18	50
8/9	36	43	57	55	60	58	53	11	24	21	60
8/10	37	37	50	53	55	52	48	21	31	22	55
8/11	31	34	52	60	56	61	56	23	31	27	61
8/12	80	90	154	161	159	163	162	77	73	73	163
8/13	64	61	177	170	176	183	177	98	90	95	183
8/14	77	77	160	159	159	157	163	83	71	67	163
8/15	49	48	89	84	91	89	92	50	43	40	92
8/16	40	37	76	70	67	60	67	31	42	34	76
8/17	34	31	63	61	93	74	86	46	56	51	93
8/18	38	33	13	8	13	11	15	22	9	8	38
8/19	44	42	54	57	57	56	52	48	36	27	57
8/20	37	35	71	75	77	82	72	38	49	42	82
8/21	41	42	51	51	53	54	51	19	18	16	54
8/22	38	40	52	43	54	52	51	28	28	24	54
8/23	40	42	28	46	27	31	29	21	21	16	46
8/24	45	36	26	31	22	22	25	18	19	12	45
8/25	45	45	20	31	28	25	28	26	22	17	45
8/26	43	45	58	62	61	58	58	42	40	35	62
8/27	39	38	19	31	22	23	25	17	16	13	39
8/28	41	40	16	21	20	19	21	25	13	10	41
8/29	47	51	13	23	19	18	24	18	16	14	51
8/30	47	48	38	48	40	37	37	44	48	40	48
8/31	39	41	24	28	28	23	20	26	37	31	41
AVG	49	48	68	70	71	70	70	36	40	36	79
MAX	100	97	177	176	176	183	177	98	90	95	183