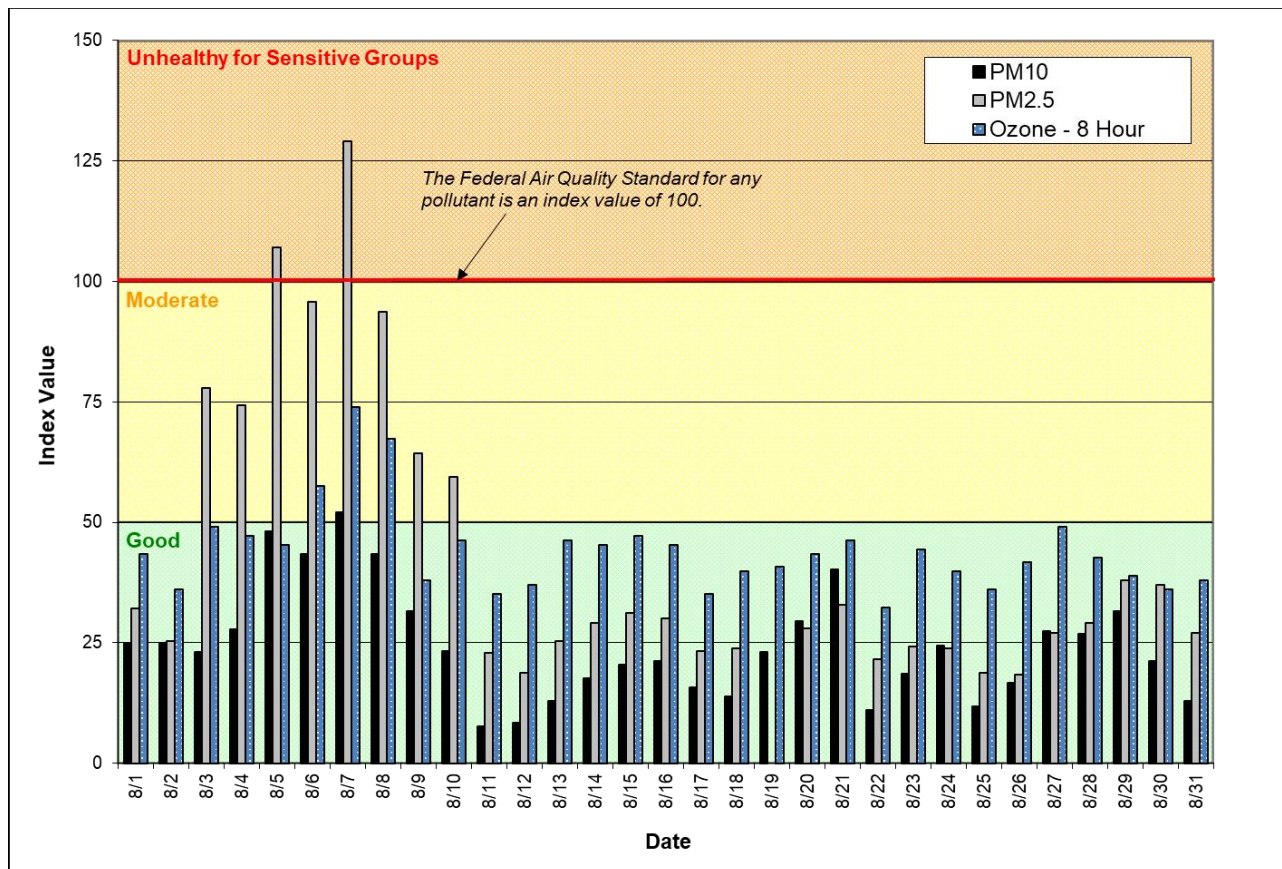


Spokane Regional Clean Air Agency Air Quality Report - August 2019

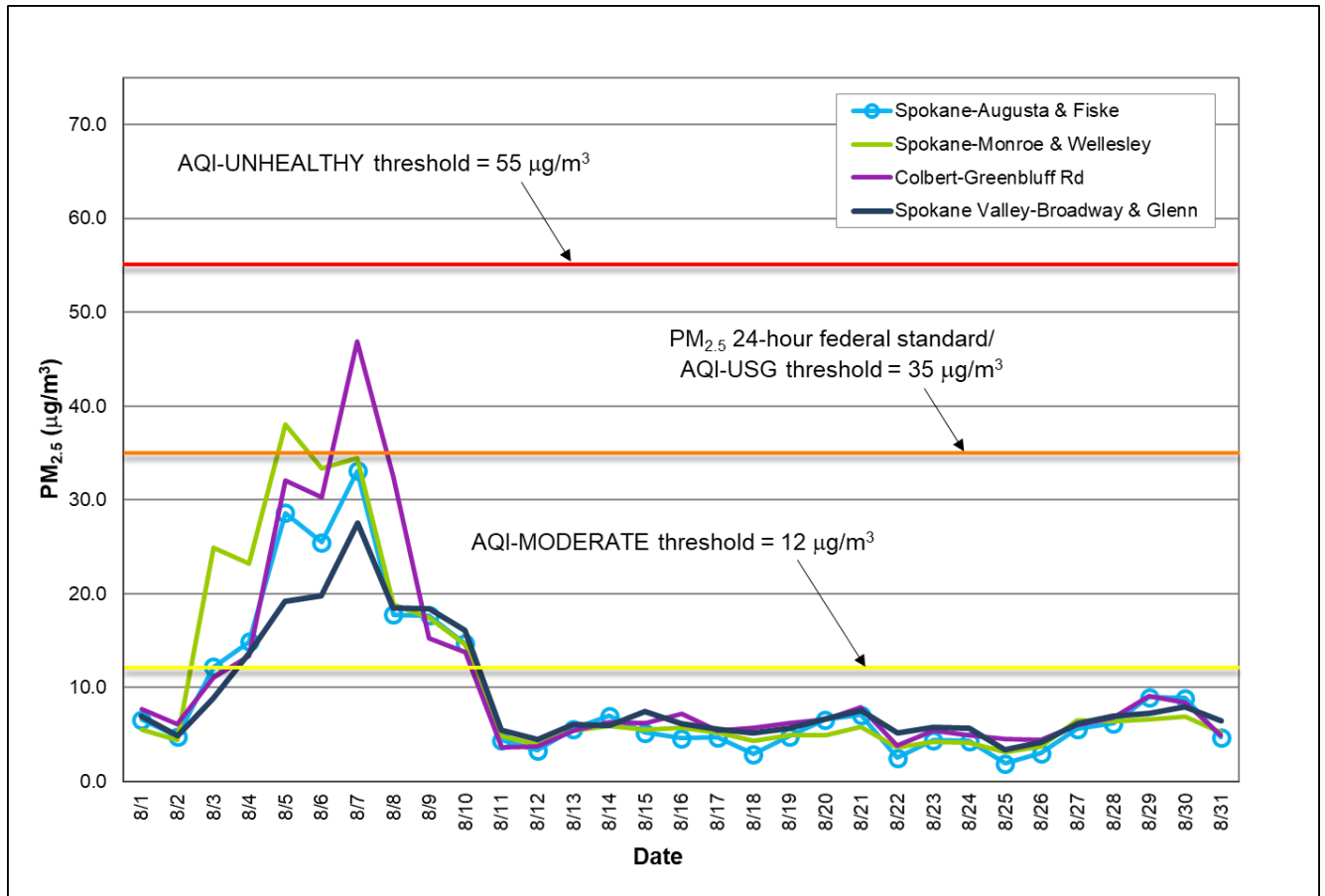
Smoke from the Williams Flats fire on the Colville Reservation pushed concentrations of fine particles (PM_{2.5}) to the Moderate (yellow) and Unhealthy for Sensitive Groups (orange) categories of the Air Quality Index (AQI) in early August (Figure 1). The Eagle Bluff fire north of Osoyoos, British Columbia also contributed significantly to the poor air quality in the Spokane area at that time. The worst air quality for the month was recorded on the 7th, when the AQI reached 129 (Unhealthy for Sensitive Groups; 24-hour average mass concentration = 46.9 µg/m³) based on PM_{2.5} concentrations recorded at the Colbert air monitoring station. Ozone and PM₁₀ were also elevated during that period, with the highest concentrations of both pollutants recorded on the 7th.

Figure 1: Air Quality Index (AQI) values for August 2019. The data represent the maximum AQI values across all monitoring stations within Spokane County.



See Appendix 1 of this report for information about federal air quality standards or Appendix 2 for a description of the AQI. Daily mass concentrations of PM_{2.5} monitored in August throughout the network are shown in Figure 2.

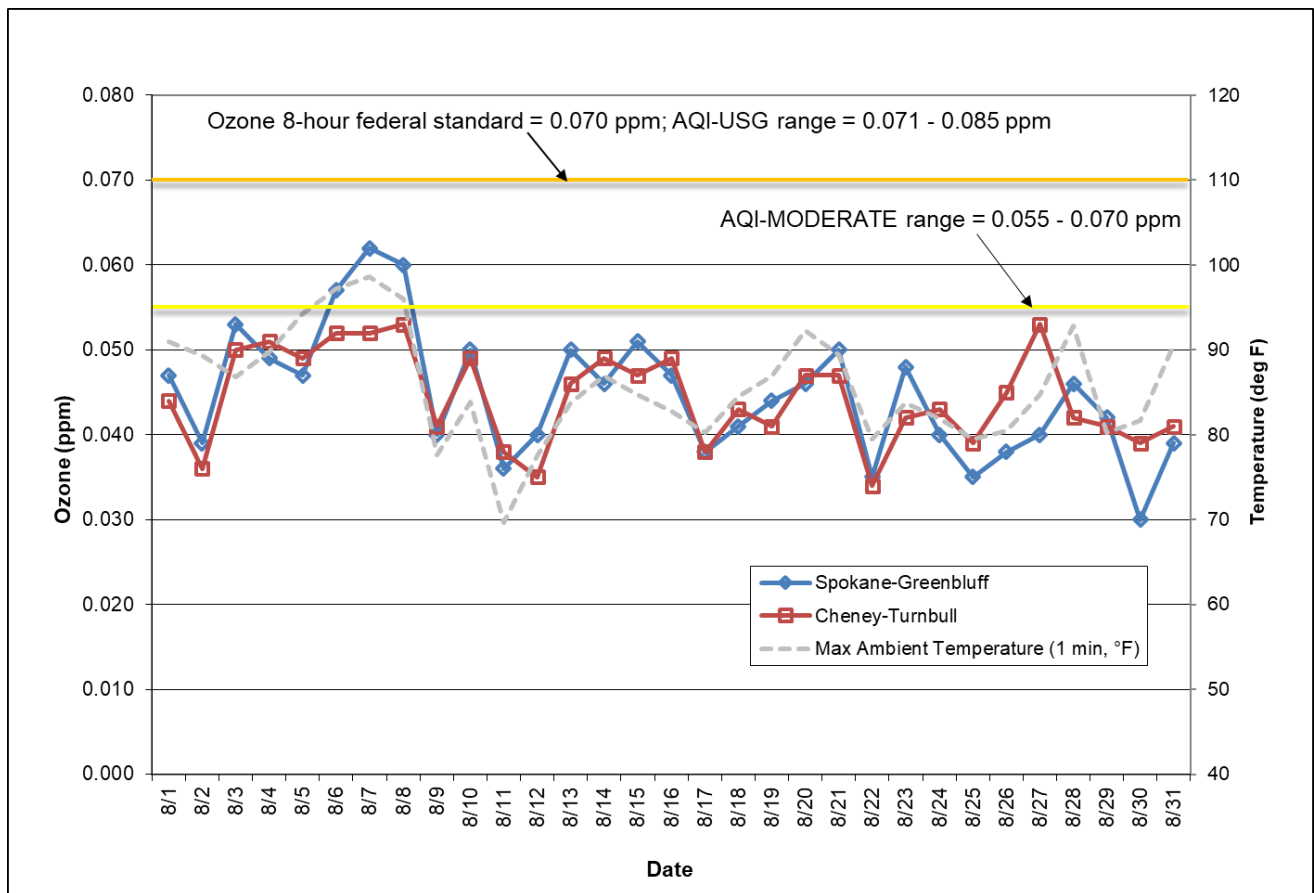
Figure 2: Multi-station 24-hour average PM_{2.5} for August 2019; Spokane County.



Ground-level ozone is formed when nitrogen oxides and volatile organic compounds chemically react in the presence of sunlight. It is measured in units of parts per million (ppm) in ambient air. Ozone is a strong oxidizer and can damage lung tissue, thereby impairing respiratory function. The main sources of ozone precursors are motor vehicle emissions and refueling, gasoline storage and transport, paints, solvents and industry. In Washington State, it is monitored May through September each year. The federal standard for ground-level ozone in ambient air (0.070 ppm) is based on an 8-hour average concentration (see Appendix 1).

The maximum 8-hour running average ozone concentration for the month was 0.062 ppm measured at Greenbluff on the 7th (Figure 3). Eight-hour average ozone concentrations in the range 0.055 to 0.070 ppm are considered “moderate” air quality by the AQI. When concentrations are below that level, air quality is “good” with respect to ground-level ozone.

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. It is not a violation of the standard to exceed this level on a given day because determination of attainment status is based on averaging data over a period of years. See Appendix 1 for more detailed information about attainment of federal air quality standards.



The August daily air quality data for all monitoring stations in the Spokane region are provided in Appendix 3. Current and historical air quality data can be obtained electronically from Ecology's air monitoring data website, <https://fortress.wa.gov/ecy/enviwa/Default.htm>.

Tables 1 and 2 contain the maximum AQI values for each pollutant for the month and for the year to date. Table 3 summarizes the year to date daily AQIs by category. See Appendix 2 for an explanation of the AQI.

Table 1: Maximum AQI values and pollutant concentrations for this reporting period.

| Pollutant | AQI | | Location | Date |
|-------------------|---------------------------------------|----------|--|------|
| O ₃ | 74 (conc. = 0.062 ppm) | Moderate | Spokane, Greenbluff | 8/7 |
| PM ₁₀ | 52 (conc. = 58 µg/m ³) | Moderate | Spokane, E Augusta Ave (Augusta & Fiske) | 8/7 |
| PM _{2.5} | 129 (conc. = 46.9 µg/m ³) | USG | Colbert, E Greenbluff Rd | 8/7 |

Table 2: Maximum AQI values and pollutant concentrations for this year to date.

| Pollutant | AQI | | Location | Date |
|-------------------|---------------------------------------|----------|--|------|
| O ₃ | 87 (conc. = 0.066 ppm) | Moderate | Spokane, Greenbluff | 6/4 |
| PM ₁₀ | 76 (conc. = 106 µg/m ³) | Moderate | Spokane, E Augusta Ave (Augusta & Fiske) | 3/18 |
| PM _{2.5} | 129 (conc. = 46.9 µg/m ³) | USG | Colbert, E Greenbluff Rd | 8/7 |

Table 3: AQI summary as of August 31, 2019

| Category | Number of days in August | Number of days this year to date |
|--|--------------------------|----------------------------------|
| Good (0-50) | 23 | 212 |
| Moderate (51-100) | 6 | 29 |
| Unhealthy for Sensitive Groups (101-150) | 2 | 2 |
| Unhealthy (151-200) | 0 | 0 |
| Very Unhealthy (201-300) | 0 | 0 |
| Hazardous (>300) | 0 | 0 |

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 (NO₂), particulate matter (PM₁₀ and PM_{2.5}), ground-level ozone (O₃) and sulfur dioxide (SO₂; 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 (NO₂) | | 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 (O₃) | | 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 (SO₂) | | 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/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ 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) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO₂ 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 SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ 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 ($\mu\text{g}/\text{m}^3$) and daily 8-hour maximum ozone concentrations are reported in parts per million (ppm).

| Date | Ozone Greenbluff (8 hour max, ppm) | Ozone Turnbull NWR (8 hour max, ppm) | PM _{2.5} Augusta & Fiske BAM (24 hour avg, $\mu\text{g}/\text{m}^3$) | PM _{2.5} Broadway & University BAM (24 hour avg, $\mu\text{g}/\text{m}^3$) | PM _{2.5} Colbert TEOM (24 hour avg, $\mu\text{g}/\text{m}^3$) | PM _{2.5} Monroe & Wellesley nephelometer (24 hour avg, $\mu\text{g}/\text{m}^3$) | PM ₁₀ Augusta & Fiske TEOM (24 hour avg, $\mu\text{g}/\text{m}^3$) | PM ₁₀ Turnbull NWR BAM (24 hour avg, $\mu\text{g}/\text{m}^3$) |
|------|------------------------------------|--------------------------------------|--|--|---|--|--|--|
| 8/1 | 0.047 | 0.044 | 6.6 | 7.0 | 7.7 | 5.5 | 27 | 18 |
| 8/2 | 0.039 | 0.036 | 4.8 | 4.9 | 6.1 | 4.4 | 27 | 21 |
| 8/3 | 0.053 | 0.050 | 12.2 | 8.9 | 11.1 | 24.9 | 25 | 15 |
| 8/4 | 0.049 | 0.051 | 14.9 | 13.7 | 13.4 | 23.2 | 30 | 27 |
| 8/5 | 0.047 | 0.049 | 28.6 | 19.2 | 32.1 | 38.0 | 52 | 29 |
| 8/6 | 0.057 | 0.052 | 25.5 | 19.8 | 30.3 | 33.4 | 47 | 32 |
| 8/7 | 0.062 | 0.052 | 33.1 | 27.5 | 46.9 | 34.5 | 58 | 56 |
| 8/8 | 0.060 | 0.053 | 17.8 | 18.5 | 32.4 | 18.8 | 47 | 39 |
| 8/9 | 0.040 | 0.041 | 17.7 | 18.4 | 15.3 | 17.5 | 34 | 26 |
| 8/10 | 0.050 | 0.049 | 14.7 | 16.1 | 13.8 | 14.6 | 24 | 25 |
| 8/11 | 0.036 | 0.038 | 4.4 | 5.5 | 3.6 | 4.8 | 7 | 8 |
| 8/12 | 0.040 | 0.035 | 3.3 | 4.5 | 3.7 | 3.9 | 9 | 6 |
| 8/13 | 0.050 | 0.046 | 5.6 | 6.1 | 5.4 | 5.4 | 14 | 14 |
| 8/14 | 0.046 | 0.049 | 7.0 | 6.0 | 6.3 | 5.9 | 19 | 15 |
| 8/15 | 0.051 | 0.047 | 5.2 | 7.5 | 6.2 | 5.5 | 22 | 16 |
| 8/16 | 0.047 | 0.049 | 4.6 | 6.2 | 7.2 | 5.7 | 23 | 18 |
| 8/17 | 0.038 | 0.038 | 4.7 | 5.6 | 5.4 | 5.2 | 17 | 16 |
| 8/18 | 0.041 | 0.043 | 2.9 | 5.2 | 5.7 | 4.3 | 15 | 12 |
| 8/19 | 0.044 | 0.041 | 4.8 | 5.7 | 6.2 | 4.9 | 25 | 21 |
| 8/20 | 0.046 | 0.047 | 6.6 | 6.7 | 6.6 | 4.9 | 29 | 32 |
| 8/21 | 0.050 | 0.047 | 7.1 | 7.6 | 7.9 | 5.8 | 37 | 44 |
| 8/22 | 0.035 | 0.034 | 2.5 | 5.2 | 3.8 | 3.6 | 12 | 12 |
| 8/23 | 0.048 | 0.042 | 4.4 | 5.8 | 5.4 | 4.2 | 20 | 19 |
| 8/24 | 0.040 | 0.043 | 4.3 | 5.7 | 4.9 | 4.1 | 24 | 26 |
| 8/25 | 0.035 | 0.039 | 1.9 | 3.4 | 4.5 | 3.1 | 12 | 13 |
| 8/26 | 0.038 | 0.045 | 3.0 | 4.2 | 4.4 | 3.7 | 18 | 15 |
| 8/27 | 0.040 | 0.053 | 5.6 | 6.2 | 6.0 | 6.5 | 25 | 30 |
| 8/28 | 0.046 | 0.042 | 6.2 | 7.0 | 6.8 | 6.4 | 29 | 24 |
| 8/29 | 0.042 | 0.041 | 9.0 | 7.3 | 9.1 | 6.6 | 34 | 23 |
| 8/30 | 0.030 | 0.039 | 8.9 | 8.0 | 8.4 | 6.9 | 23 | 11 |
| 8/31 | 0.039 | 0.041 | 4.7 | 6.5 | 4.9 | 5.2 | 14 | 14 |
| AVG | 0.045 | 0.044 | 9.1 | 9.0 | 10.7 | 10.4 | 26 | 22 |
| MAX | 0.062 | 0.053 | 33.1 | 27.5 | 46.9 | 38.0 | 58 | 56 |