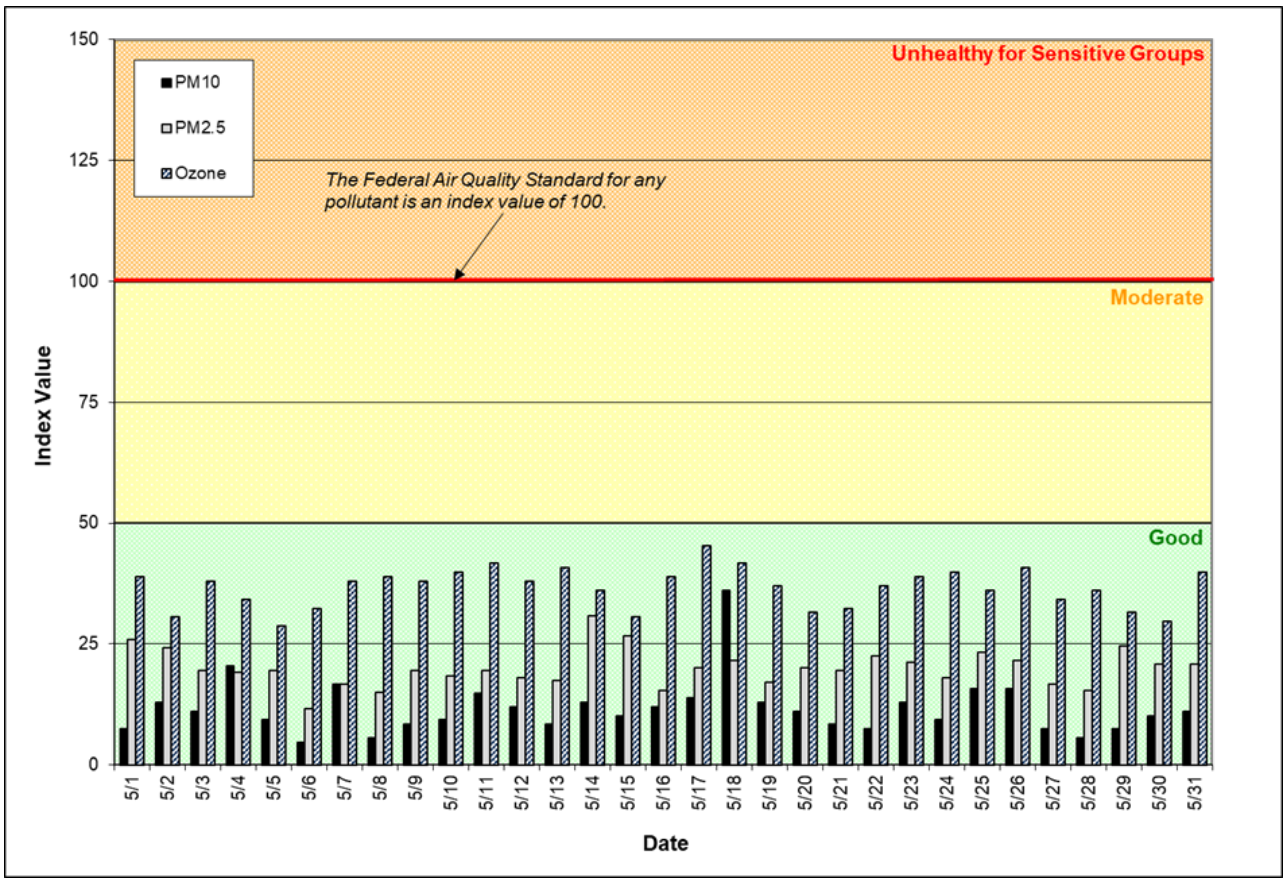
Spokane Regional Clean Air Agency
Air Quality Report – May 2022

Springtime is characterized by good air quality - the best of the year, historically-speaking. This spring has been no exception – the last time the Air Quality Index (AQI) was outside the GOOD range was on March 27th when $PM_{2.5}$ reached the AQI-MODERATE category. What has been exceptional is the is the persistence of the cool and wet weather, which has helped keep air pollution levels low.

Ground-level ozone is monitored from May through September each year at the two ozone monitoring stations in Spokane County, one at Greenbluff and one at Turnbull National Wildlife Refuge and ozone was the predominant pollutant throughout the month (Figure 1). The maximum AQI for the month was 45, based on an 8-hour average ozone concentration of 0.049 ppm recorded at Greenbluff on the 17th (Figure 2). Fine particle pollution ($PM_{2.5}$) remained quite low throughout Spokane County in May (Figure 3) as did PM_{10} particle pollution (PM_{10}), with May 18th as the only exception. PM_{10} rose sharply in the late afternoon and early evening hours of 18th (Figure 4) as strong gusty winds associated with a low-pressure system and cold front, brought blowing dust (originating mostly from agricultural land in the Columbia Basin) to the Spokane area. But the PM_{10}-based AQI remained in the GOOD category at 36, lower than that day's ozone-based AQI of 42.

<u>Figure 1</u>: Air Quality Index (AQI) values for May 2022. The data represent the maximum AQI values across all monitoring stations within Spokane County.



From January through May 2022, there have been 128 GOOD air quality days and only 23 MODERATE days (Table 1). The highest AQI value to date was 66, based on $PM_{2.5}$ (24-hour avg mass concentration = 19.1 $\mu g/m^3$) recorded at the Spokane Valley – Broadway Ave monitoring station on January 29th (Table 3).

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 September 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 4: Eight-hour maximum ozone concentrations for the Spokane region in May. 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.

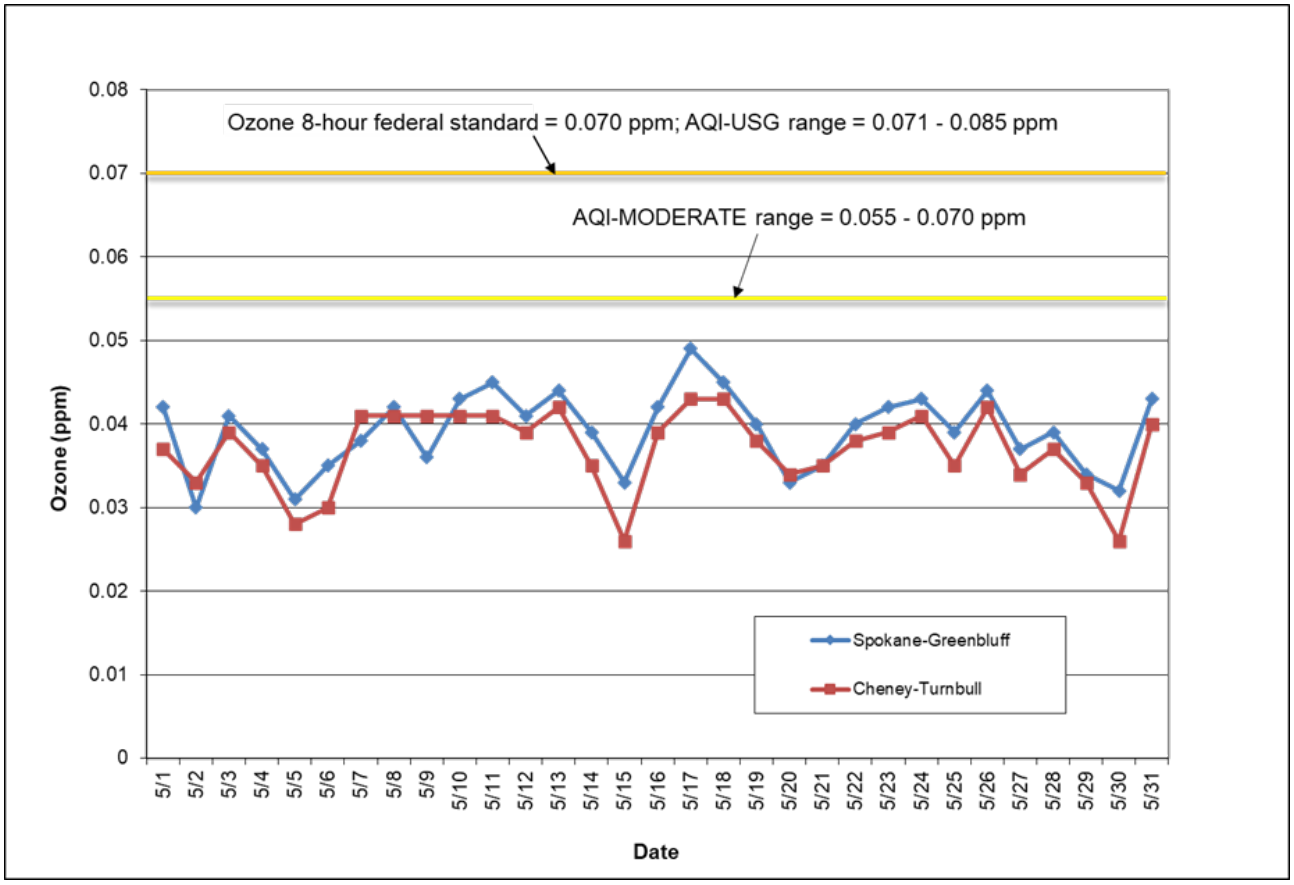


Figure 2: Multi-station 24-hour average $PM_{2.5}$ for May 2022; Spokane County.

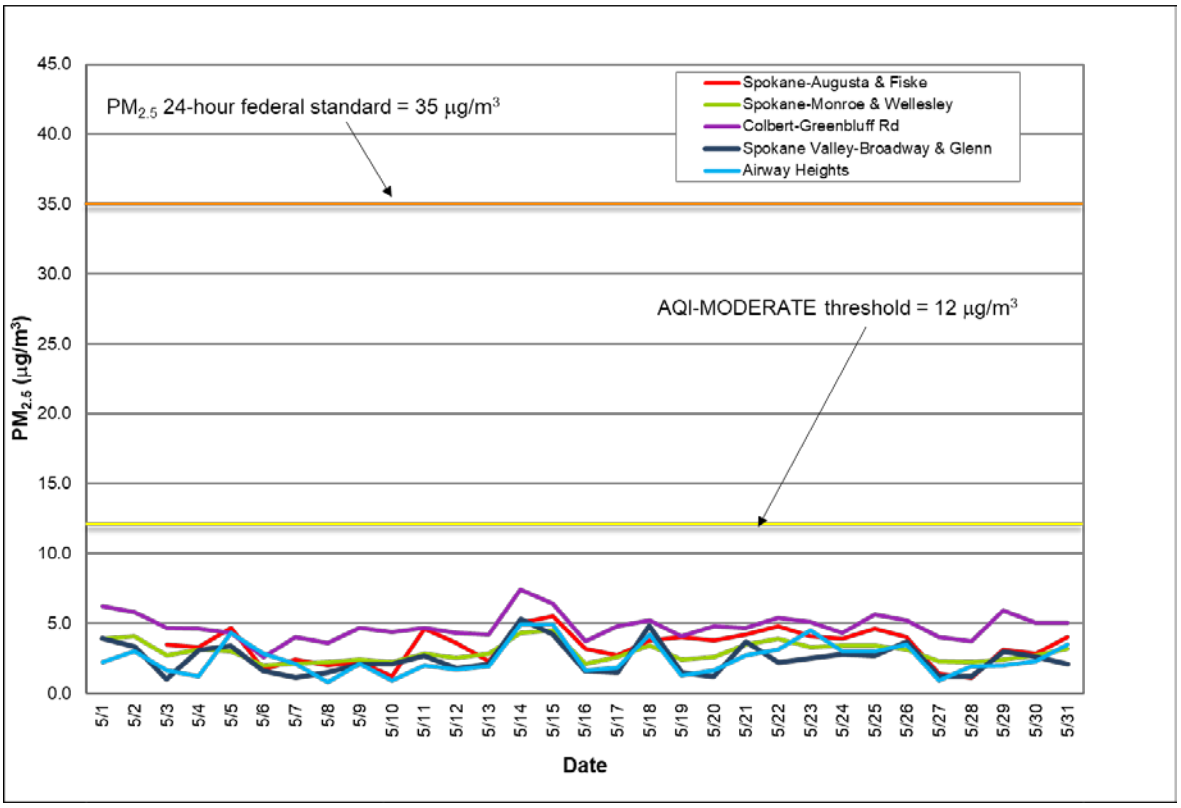


Figure 3: Multi-station 24-hour average PM_{10} for May 2022; Spokane County. The inset chart shows the effect of strong winds/blowing dust on PM_{10} 1-hour average mass concentrations on May 18th.

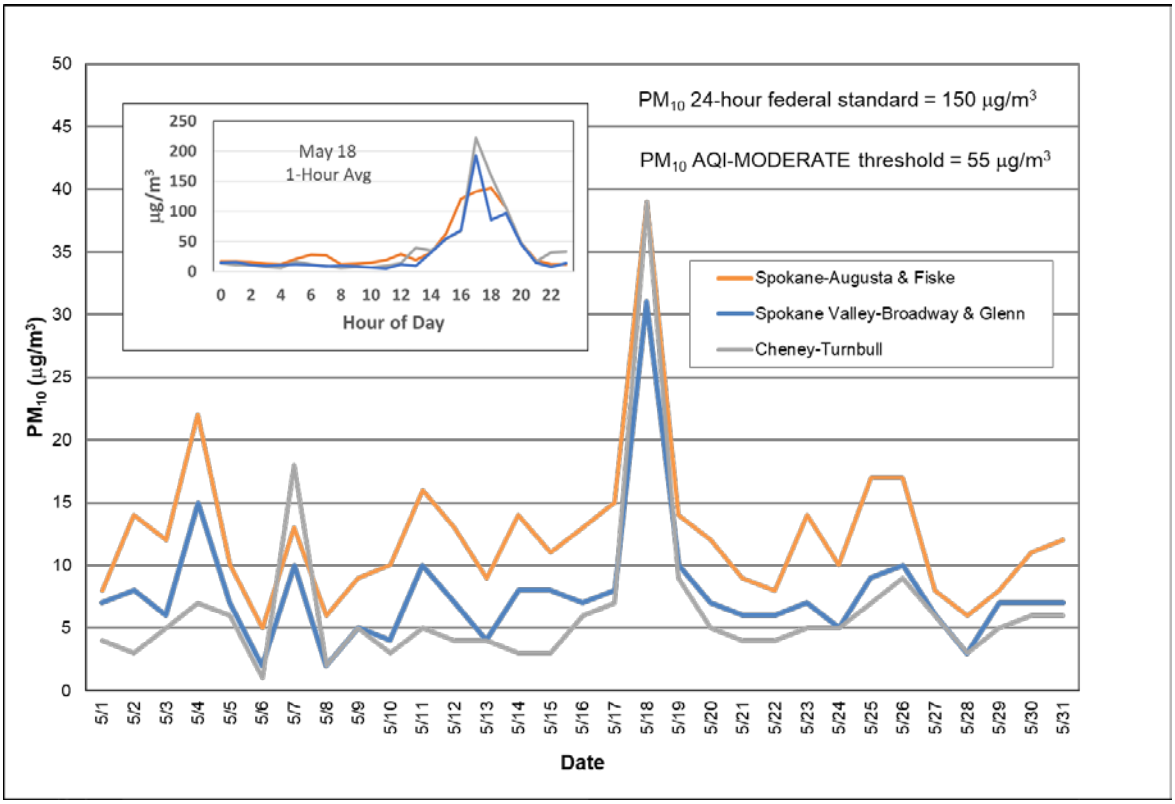


Table 1 summarizes the daily AQIs by category for the month and year-to-date and Tables 2 and 3 contain the maximum AQI values for each pollutant for the month and for the year-to-date, respectively.

Table 1: AQI summary as of May 31, 2022

Category	Number of days in May	Number of days this year to date
Good (0-50)	31	128
Moderate (51-100)	0	23
Unhealthy for Sensitive Groups (101-150)	0	0
Unhealthy (151-200)	0	0
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	45 (conc. = 0.049 ppm)	Good	Greenbluff	5/17
PM_{10}	36 (conc. = 39 µg/m^3)	Good	Spokane-Augusta Ave (Augusta & Fiske), Turnbull	5/18
$PM_{2.5}$	31 (conc. = 7.4 µg/m^3)	Good	Colbert	5/14

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

Pollutant	AQI		Location	Date
O_3	45 (conc. = 0.049 ppm)	Good	Greenbluff	5/17
PM_{10}	44 (conc. = 47 µg/m^3)	Good	Spokane-Augusta Ave (Augusta & Fiske)	3/30
$PM_{2.5}$	66 (conc. = 19.1 µg/m^3)	Mod	Spokane Valley-Broadway Ave (Broadway & Glenn)	1/29

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 May 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). The $PM_{2.5}$ monitor at Spokane – Augusta & Fiske was down on the 1st and 2nd for the completion of its annual maintenance and calibration. 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, $\mu g/m^3$)
5/1	0.037	0.042	2.2	6.2		3.9	3.9	4	8	7
5/2	0.033	0.03	3	5.8		3.3	4.1	3	14	8
5/3	0.039	0.041	1.6	4.7	3.5	1	2.7	5	12	6
5/4	0.035	0.037	1.2	4.6	3.3	3.1	3.1	7	22	15
5/5	0.028	0.031	4.3	4.3	4.7	3.4	3	6	10	7
5/6	0.03	0.035	2.8	2.6	1.7	1.6	2	1	5	2
5/7	0.041	0.038	2.1	4	2.4	1.1	2.1	18	13	10
5/8	0.041	0.042	0.8	3.6	2	1.5	2.2	2	6	2
5/9	0.041	0.036	2.1	4.7	2.2	2.1	2.4	5	9	5
5/10	0.041	0.043	0.9	4.4	1.2	2.1	2.2	3	10	4
5/11	0.041	0.045	2	4.7	4.6	2.7	2.8	5	16	10
5/12	0.039	0.041	1.7	4.3	3.6	1.8	2.5	4	13	7
5/13	0.042	0.044	1.9	4.2	2.3	2.1	2.8	4	9	4
5/14	0.035	0.039	4.9	7.4	5	5.3	4.3	3	14	8
5/15	0.026	0.033	4.9	6.4	5.5	4.2	4.5	3	11	8
5/16	0.039	0.042	1.6	3.7	3.2	1.6	2.1	6	13	7
5/17	0.043	0.049	1.8	4.8	2.7	1.5	2.6	7	15	8
5/18	0.043	0.045	4.2	5.2	3.8	4.8	3.4	39	39	31
5/19	0.038	0.04	1.3	4.1	4	1.5	2.4	9	14	10
5/20	0.034	0.033	1.6	4.8	3.8	1.2	2.6	5	12	7
5/21	0.035	0.035	2.7	4.7	4.2	3.7	3.5	4	9	6
5/22	0.038	0.04	3.1	5.4	4.8	2.2	3.9	4	8	6
5/23	0.039	0.042	4.5	5.1	4.1	2.5	3.3	5	14	7
5/24	0.041	0.043	3	4.3	3.9	2.8	3.4	5	10	5
5/25	0.035	0.039	3	5.6	4.6	2.7	3.4	7	17	9
5/26	0.042	0.044	3.5	5.2	4	3.7	3.1	9	17	10
5/27	0.034	0.037	0.9	4	1.4	1.2	2.3	6	8	6
5/28	0.037	0.039	1.9	3.7	1.1	1.2	2.2	3	6	3
5/29	0.033	0.034	2	5.9	3.1	3	2.4	5	8	7
5/30	0.026	0.032	2.3	5	2.8	2.6	2.7	6	11	7
5/31	0.04	0.043	3.5	5	4	2.1	3.2	6	12	7
AVG	0.037	0.039	2.5	4.8	3.4	2.5	2.9	6	12	8
MAX	0.043	0.049	4.9	7.4	5.5	5.3	4.5	39	39	31

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
5/1	34	39	9	26		16	16	4	7	6	39
5/2	31	28	13	24		14	17	3	13	7	31
5/3	36	38	7	20	15	4	11	5	11	6	38
5/4	32	34	5	19	14	13	13	6	20	14	34
5/5	26	29	18	18	20	14	13	6	9	6	29
5/6	28	32	12	11	7	7	8	1	5	2	32
5/7	38	35	9	17	10	5	9	17	12	9	38
5/8	38	39	3	15	8	6	9	2	6	2	39
5/9	38	33	9	20	9	9	10	5	8	5	38
5/10	38	40	4	18	5	9	9	3	9	4	40
5/11	38	42	8	20	19	11	12	5	15	9	42
5/12	36	38	7	18	15	8	10	4	12	6	38
5/13	39	41	8	18	10	9	12	4	8	4	41
5/14	32	36	20	31	21	22	18	3	13	7	36
5/15	24	31	20	27	23	18	19	3	10	7	31
5/16	36	39	7	15	13	7	9	6	12	6	39
5/17	40	45	8	20	11	6	11	6	14	7	45
5/18	40	42	18	22	16	20	14	36	36	29	42
5/19	35	37	5	17	17	6	10	8	13	9	37
5/20	31	31	7	20	16	5	11	5	11	6	31
5/21	32	32	11	20	18	15	15	4	8	6	32
5/22	35	37	13	23	20	9	16	4	7	6	37
5/23	36	39	19	21	17	10	14	5	13	6	39
5/24	38	40	13	18	16	12	14	5	9	5	40
5/25	32	36	13	23	19	11	14	6	16	8	36
5/26	39	41	15	22	17	15	13	8	16	9	41
5/27	31	34	4	17	6	5	10	6	7	6	34
5/28	34	36	8	15	5	5	9	3	6	3	36
5/29	31	31	8	25	13	13	10	5	7	6	31
5/30	24	30	10	21	12	11	11	6	10	6	30
5/31	37	40	15	21	17	9	13	6	11	6	40
AVG	34	36	10	20	14	10	12	6	11	7	37
MAX	40	45	20	31	23	22	19	36	36	29	45