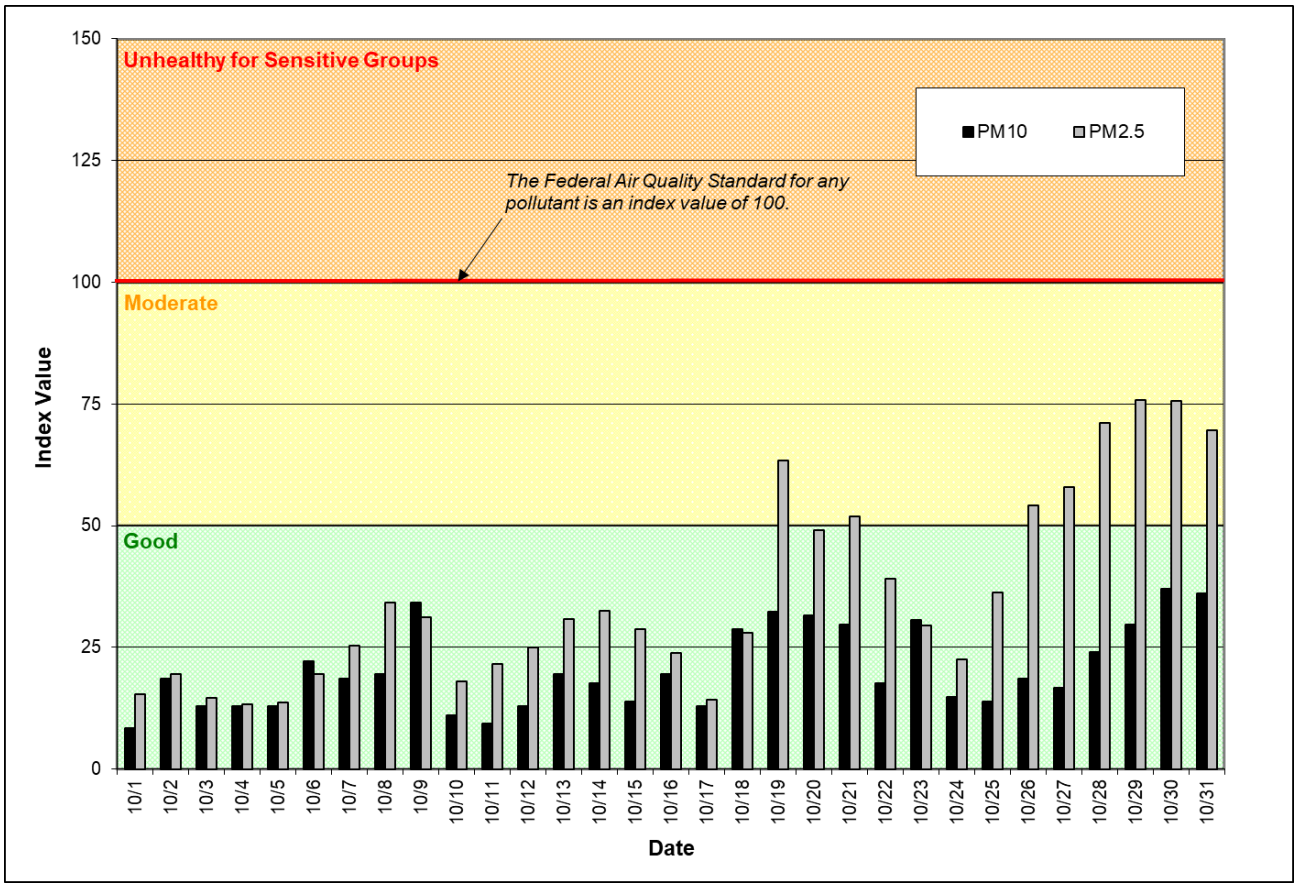
Spokane Regional Clean Air Agency
Air Quality Report - October 2023

The daily Air Quality Index (AQI) was in the MODERATE category on eight days in October and was in the GOOD category on the remaining 23 days (**Figure 1 and Table 1**). The maximum daily AQI was 76, based on a 24-hour average $PM_{2.5}$ concentration of 23.9 µg/m^3 recorded at Spokane-Augusta & Fiske on the 29th (**Figure 2 and Table 2**). The maximum AQI for PM_{10} was 37 (24-hour $PM_{2.5}$ mass concentration = 40 µg/m^3), recorded on the 30th at Spokane-Augusta & Fiske.

Figure 1: Air Quality Index (AQI) values for October 2023. The data represent the maximum AQI values across all monitoring stations within Spokane County. High atmospheric pressure late in the month brought light wind conditions and less atmospheric mixing, and rising pollution levels.



See Appendix 1 of this report for a description of the AQI, Appendix 2 for information about federal air quality standards, and Appendix 3 for a summary of daily $PM_{2.5}$, and PM_{10} concentrations and AQIs across the Spokane-area ambient air monitoring network. Current and historical ambient air quality data can also be obtained from the Washington State Department of Ecology's air monitoring data website, https://enviwa.ecology.wa.gov/home/map.

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, respectively.

Figure 2: Daily 24-hour average $PM_{2.5}$, all Spokane County monitoring stations, October 2023. The elevated reading on the 19th at Spokane-Valley-Broadway & Glenn was caused by smoke from a prescribed burn at Turnbull National Wildlife Refuge that afternoon. The smoke plume remained at ground level as it traveled toward the northeast and did not appear to have diluted much when it reached Spokane Valley. Turnbull and Greenbluff data (dashed) are collected using "low-cost" sensors - a technology that, although slightly less accurate than the Agency's regulatory grade monitors, enables the expansion of the monitoring network into areas that would otherwise go unmonitored. High atmospheric pressure late in the month brought light wind conditions and less atmospheric mixing, leading to rising pollution levels. The Airway Heights monitor was offline from the 19th through the 24th for annual maintenance and calibration. A weak cellular signal caused an intermittent loss of data at Greenbluff.

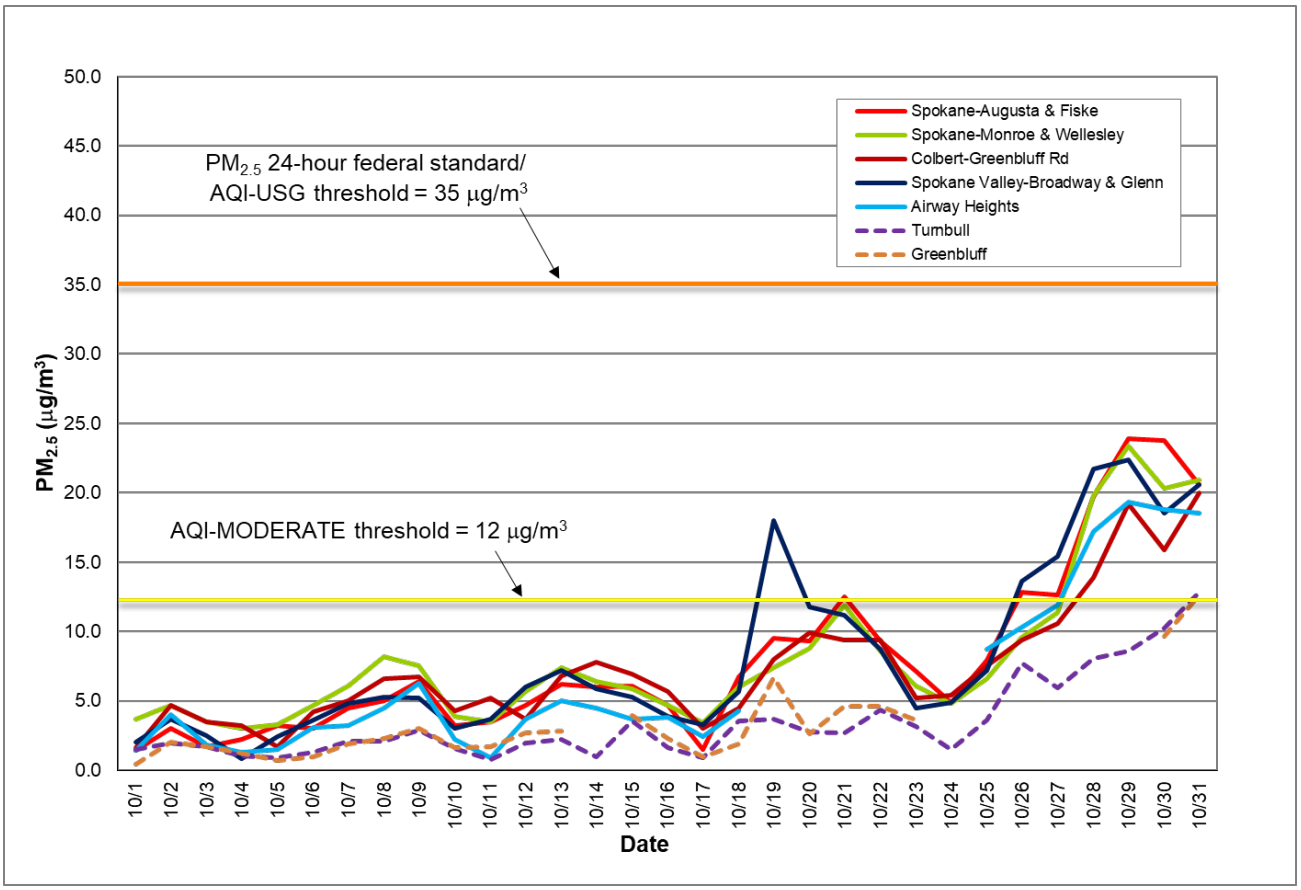


Table 1: AQI summary, October 2023

Category	Number of days in October	Number of days this year to date
Good (0-50)	23	232
Moderate (51-100)	8	67
Unhealthy for Sensitive Groups (101-150)	0	1
Unhealthy (151-200)	0	2
Very Unhealthy (201-300)	0	1
Hazardous (>300)	0	1

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

Pollutant	AQI		Location	Date
PM_{10}	37 (conc. = 40 µg/m^3)	Good	Spokane-Augusta & Fiske	10/30
$PM_{2.5}$	76 (conc. = 23.9 µg/m^3)	Moderate	Spokane-Augusta & Fiske	10/29

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

Pollutant	AQI		Location	Date
Ozone	88 (conc. = 0.066 ppm)	Moderate	Turnbull National Wildlife Refuge	8/19
PM_{10}	164 (mass conc. = 281 µg/m^3)	Unhealthy	Spokane Valley – Broadway & Glenn	8/19
$PM_{2.5}$	368 (mass conc. = 317.7 µg/m^3)	Hazardous	Spokane – Greenbluff	8/19

Appendix 1 – 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 2 – 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 3

Table A-3: October summary air quality data for air monitoring stations in Spokane County. Particulate matter mass concentration is reported as 24-hour averages in micrograms per cubic meter of air (μg/m^3). See Appendix 2 for an explanation of the Air Quality Index. The Airway Heights $PM_{2.5}$ monitor was offline October 19th-24th for annual calibration and maintenance. The Greenbluff $PM_{2.5}$ sensor had intermittent loss of data because of a weak cellular signal. The Turnbull monitoring station lost power on the 14th which resulted in loss of data on the 14th, 15th, and 16th.

Pollutant Concentration										
	$PM_{2.5}$ (μg/m^3) 24-Hour Avg							PM_{10} (μg/m^3) 24-Hour Avg		
Date	$PM_{2.5}$ - Airway Heights, 12th & Lawson	$PM_{2.5}$ - Colbert, E Greenbluff Rd	$PM_{2.5}$ - Spokane, Augusta & Fiske	$PM_{2.5}$ - Spokane Valley, Broadway & Glenn	$PM_{2.5}$ - Spokane, Monroe & Wellesley	$PM_{2.5}$ - Turnbull NWR (temporary sensor)	$PM_{2.5}$ - Greenbluff (temporary sensor)	PM_{10} - Turnbull NWR BAM	PM_{10} - Spokane, Augusta & Fiske	PM_{10} - Spokane Valley, Broadway & Glenn
10/1	1.4	1.6	1.4	2.0	3.7	1.5	0.4	5	9	4
10/2	4.0	4.7	3.0	3.7	4.7	1.9	2.1	11	20	12
10/3	1.8	3.5	1.7	2.5	3.5	1.7	1.7	5	14	11
10/4	1.3	3.2	2.2	0.8	3.0	1.0	1.2	4	14	6
10/5	1.5	1.7	3.2	2.4	3.3	0.9	0.7	4	14	12
10/6	3.1	4.2	3.0	3.6	4.7	1.3	1.0	9	24	17
10/7	3.2	5.0	4.5	4.8	6.1	2.1	1.9	16	20	13
10/8	4.5	6.6	5.0	5.3	8.2	2.1	2.3	15	21	14
10/9	6.3	6.7	6.4	5.2	7.5	2.9	3.0	18	37	21
10/10	2.2	4.3	3.2	3.0	3.9	1.6	1.6	5	12	8
10/11	0.9	5.2	3.5	3.7	3.5	0.8	1.7	1	10	4
10/12	3.7	3.7	4.7	6.0	5.7	2.0	2.7	2	14	9
10/13	5.0	6.8	6.2	7.2	7.4	2.2	2.8	6	21	13
10/14	4.5	7.8	6.0	5.9	6.4	0.9			19	9
10/15	3.7	6.9	6.1	5.3	5.9	3.5	3.9		15	10
10/16	3.8	5.7	4.7	3.9	4.7	1.6	2.3		21	11
10/17	2.4	3.0	1.5	3.3	3.4	0.9	1.0	6	14	8
10/18	4.3	4.5	6.7	5.7	6.0	3.5	1.9	11	31	15
10/19		8.0	9.5	18.0	7.4	3.7	6.7	12	35	32
10/20		9.9	9.3	11.8	8.8	2.7	2.6	11	34	27
10/21		9.4	12.5	11.2	11.9	2.7	4.6	14	32	21
10/22		9.4	9.3	8.7	8.6	4.3	4.6	15	19	15
10/23		5.2	7.1	4.5	6.1	3.2	3.6	16	33	16
10/24		5.4	4.9	4.9	4.8	1.5		8	16	11
10/25	8.7	7.5	7.9	7.2	6.6	3.6	3.1	6	15	9
10/26	10.3	9.4	12.8	13.6	9.6	7.8		12	20	18
10/27	11.9	10.6	12.6	15.4	11.4	5.9		8	18	17
10/28	17.2	13.9	19.7	21.7	19.8	8.1	7.2	8	26	26
10/29	19.3	19.2	23.9	22.4	23.4	8.6		8	32	26
10/30	18.8	15.9	23.8	18.5	20.3	10.3	9.7	10	40	26
10/31	18.5	20	20.6	20.6	20.9	12.8	12.6	18	39	33
AVG	6.5	7.4	8.0	8.2	8.1	3.5	3.3	9	22	15
MAX	19.3	20.0	23.9	22.4	23.4	12.8	12.6	18	40	33

Air Quality Index (AQI)											
	$PM_{2.5}$							PM_{10}			
Date	$PM_{2.5}$ - Airway Heights, 12th & Lawson	$PM_{2.5}$ - Colbert, E Greenbluff Rd	$PM_{2.5}$ - Spokane - Augusta & Fiske	$PM_{2.5}$ - Spokane Valley, Broadway & Glenn	$PM_{2.5}$ - Spokane, Monroe & Wellesley	$PM_{2.5}$ - Turnbull NWR (temporary sensor)	$PM_{2.5}$ - Greenbluff (temporary sensor)	PM_{10} - Turnbull NWR	PM_{10} - Spokane, Augusta & Fiske	PM_{10} - Spokane Valley, Broadway & Glenn	MAXIMUM
10/1	6	7	6	8	15	6	2	5	8	4	15
10/2	17	20	13	15	20	8	9	10	19	11	20
10/3	8	15	7	10	15	7	7	5	13	10	15
10/4	5	13	9	3	13	4	5	4	13	6	13
10/5	6	7	13	10	14	4	3	4	13	11	14
10/6	13	18	13	15	20	5	4	8	22	16	22
10/7	13	21	19	20	25	9	8	15	19	12	25
10/8	19	28	21	22	34	9	10	14	19	13	34
10/9	26	28	27	22	31	12	13	17	34	19	34
10/10	9	18	13	13	16	7	7	5	11	7	18
10/11	4	22	15	15	15	3	7	1	9	4	22
10/12	15	15	20	25	24	8	11	2	13	8	25
10/13	21	28	26	30	31	9	12	6	19	12	31
10/14	19	33	25	25	27	4			18	8	33
10/15	15	29	25	22	25	15	16		14	9	29
10/16	16	24	20	16	20	7	10		19	10	24
10/17	10	13	6	14	14	4	4	6	13	7	14
10/18	18	19	28	24	25	15	8	10	29	14	29
10/19		33	40	63	31	15	28	11	32	30	63
10/20		41	39	49	37	11	11	10	31	25	49
10/21		39	52	47	50	11	19	13	30	19	52
10/22		39	39	36	36	18	19	14	18	14	39
10/23		22	30	19	25	13	15	15	31	15	31
10/24		23	20	20	20	6		7	15	10	23
10/25	36	31	33	30	28	15	13	6	14	8	36
10/26	43	39	52	54	40	32		11	19	17	54
10/27	50	44	52	58	48	25		7	17	16	58
10/28	62	55	67	71	67	34	30	7	24	24	71
10/29	66	66	76	73	75	36		7	30	24	76
10/30	65	59	76	64	68	43	40	9	37	24	76
10/31	64	68	69	69	70	53	52	17	36	31	70
AVG	25	29	31	31	31	14	14	9	21	14	36
MAX	66	68	76	73	75	53	52	17	37	31	76