

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION



Appendix A

Supplemental Data to: Boundary Area Designation Recommendation

February 6, 2025

Mike Dunleavy, Governor

Christina Carpenter, Acting Commissioner

(This page serves as a placeholder for two-sided copy)

APPENDIX A: SUPPLEMENTAL DATA

A1. 2021 QUARTER 1 DATA

The data collected for quarter 1 in 2021 (Table A1) is included in analysis of the PM_{2.5} annual standard under the conclusion that instruments were operating within the normal range despite data flagging. This data is concluded to be of sufficient quality for weight of evidence purposes. DEC used QA null codes in AQS, but for weight of evidence has used the LIMS data from the FRM filter measurements to calculate the Q1 2021 average for estimating the annual design value for 2021-2023.

Table A1. A-Street daily FRM PM_{2.5} Concentrations for Q1 2021 used for the Weight of Evidence

Date	LIMS Data	AQS Data	AQS Qualifier	Data used for WOE DV Calculations
1/1/2021	84.8	84.8		84.8
1/2/2021	25.6	25.6		25.6
1/3/2021	3.3	3.3		3.3
1/4/2021			AF - Scheduled but not Collected.	
1/5/2021			AF - Scheduled but not Collected.	
1/6/2021	26.3	26.3		26.3
1/7/2021	30.4	30.4		30.4
1/8/2021	30.1	30.1		30.1
1/9/2021	28.5	28.5		28.5
1/10/2021	17.7	17.7		17.7
1/11/2021	23.7	23.7		23.7
1/12/2021	28.6		AS - Poor Quality Assurance Results.	28.6
1/13/2021	59.4		AS - Poor Quality Assurance Results.	59.4
1/14/2021	38.3		AS - Poor Quality Assurance Results.	38.3
1/15/2021	11.7		AS - Poor Quality Assurance Results.	11.7
1/16/2021	30.4		AS - Poor Quality Assurance Results.	30.4
1/17/2021	27.2		AS - Poor Quality Assurance Results.	27.2
1/18/2021	13		AS - Poor Quality Assurance Results.	13
1/19/2021	3.9		AS - Poor Quality Assurance Results.	3.9
1/20/2021	25.8		AS - Poor Quality Assurance Results.	25.8
1/21/2021	34.7		AS - Poor Quality Assurance Results.	34.7
1/22/2021	25.7		AS - Poor Quality Assurance Results.	25.7
1/23/2021	19.8		AS - Poor Quality Assurance Results.	19.8
1/24/2021	19		AS - Poor Quality Assurance Results.	19
1/25/2021	22.8		AS - Poor Quality Assurance Results.	22.8

1/26/2021	24.6		AS - Poor Quality Assurance Results.	24.6
1/27/2021	35		AS - Poor Quality Assurance Results.	35
1/28/2021	28.8		AS - Poor Quality Assurance Results.	28.8
1/29/2021	28.9		AS - Poor Quality Assurance Results.	28.9
1/30/2021	7		AS - Poor Quality Assurance Results.	7
1/31/2021	14.4		AS - Poor Quality Assurance Results.	14.4
2/1/2021	14.5		AS - Poor Quality Assurance Results.	14.5
2/2/2021	12.5		AS - Poor Quality Assurance Results.	12.5
2/3/2021	8.4		AS - Poor Quality Assurance Results.	8.4
2/4/2021	10.7		AS - Poor Quality Assurance Results.	10.7
2/5/2021	18.5		AS - Poor Quality Assurance Results.	18.5
2/6/2021	5.6		AS - Poor Quality Assurance Results.	5.6
2/7/2021	23.9		AS - Poor Quality Assurance Results.	23.9
2/8/2021	19.3		AS - Poor Quality Assurance Results.	19.3
2/9/2021	26		AS - Poor Quality Assurance Results.	26
2/10/2021			AF - Scheduled but not Collected.	
2/11/2021			AF - Scheduled but not Collected.	
2/12/2021			AF - Scheduled but not Collected.	
2/13/2021			AF - Scheduled but not Collected.	
2/14/2021			AF - Scheduled but not Collected.	
2/15/2021			AF - Scheduled but not Collected.	
2/16/2021			AF - Scheduled but not Collected.	
2/17/2021	12.1		AS - Poor Quality Assurance Results.	12.1
2/18/2021	4.1		AS - Poor Quality Assurance Results.	4.1
2/19/2021	34.1		AS - Poor Quality Assurance Results.	34.1
2/20/2021	13.1		AS - Poor Quality Assurance Results.	13.1
2/21/2021	19.6		AS - Poor Quality Assurance Results.	19.6
2/22/2021	15.4		AS - Poor Quality Assurance Results.	15.4
2/23/2021	19.7		AS - Poor Quality Assurance Results.	19.7
2/24/2021	16.1		AS - Poor Quality Assurance Results.	16.1
2/25/2021	3.1		AS - Poor Quality Assurance Results.	3.1
2/26/2021	7.3		AS - Poor Quality Assurance Results.	7.3
2/27/2021	4.2		AS - Poor Quality Assurance Results.	4.2
2/28/2021	3.2		AS - Poor Quality Assurance Results.	3.2
3/1/2021	6.8		AS - Poor Quality Assurance Results.	6.8
3/2/2021	8		AS - Poor Quality Assurance Results.	8
3/3/2021			AF - Scheduled but not Collected.	
3/4/2021			AF - Scheduled but not Collected.	

3/5/2021	12.4		AS - Poor Quality Assurance Results.	12.4
3/6/2021	14.3		AS - Poor Quality Assurance Results.	14.3
3/7/2021	12.2		AS - Poor Quality Assurance Results.	12.2
3/8/2021			AF - Scheduled but not Collected.	
3/9/2021	0.2		AS - Poor Quality Assurance Results.	0.2
3/10/2021	12.8		AS - Poor Quality Assurance Results.	12.8
3/11/2021			AF - Scheduled but not Collected.	
3/12/2021			AF - Scheduled but not Collected.	
3/13/2021			AF - Scheduled but not Collected.	
3/14/2021			AF - Scheduled but not Collected.	
3/15/2021			AF - Scheduled but not Collected.	
3/16/2021			AF - Scheduled but not Collected.	
3/17/2021			AF - Scheduled but not Collected.	
3/18/2021	13.5		AS - Poor Quality Assurance Results.	13.5
3/19/2021	6.8		AS - Poor Quality Assurance Results.	6.8
3/20/2021	8.4		AS - Poor Quality Assurance Results.	8.4
3/21/2021	13.9		AS - Poor Quality Assurance Results.	13.9
3/22/2021	11.3		AS - Poor Quality Assurance Results.	11.3
3/23/2021	4.6		AS - Poor Quality Assurance Results.	4.6
3/24/2021	3.8		AS - Poor Quality Assurance Results.	3.8
3/25/2021	8.8		AS - Poor Quality Assurance Results.	8.8
3/26/2021	9.6		AS - Poor Quality Assurance Results.	9.6
3/27/2021	6.5		AS - Poor Quality Assurance Results.	6.5
3/28/2021	5.7		AS - Poor Quality Assurance Results.	5.7
3/29/2021	3		AS - Poor Quality Assurance Results.	3
3/30/2021			AF - Scheduled but not Collected.	
3/31/2021			AF - Scheduled but not Collected.	

A2. EXCEPTIONAL EVENTS

DEC is in the process of developing the Exceptional Events Waiver Request for EPA review and approval for all wildland fire smoke impacted days in 2022 and 2023 in Fairbanks and North Pole. Tables A2 and A3 summarize the data impacted by wildland fire smoke in the Fairbanks/North Pole nonattainment area during the 2022 and 2023 wildland fire season. Red bold font indicates concentrations above the 24-hour PM_{2.5} standard, while black bold font marks concentrations above the annual PM_{2.5} concentration. In total, DEC will request exclusion of 34 days in 2022 and 21 days in 2023. A full discussion of the exceptional events can be found at <https://dec.alaska.gov/air/air-monitoring/guidance/exceptional-events/>.

Table A2. 2022 Wildland Fire Season FNSB PM_{2.5} Concentrations, $\mu\text{g}/\text{m}^3$

May-22									Jun-22									Jul-22								
24-Hour PM _{2.5} Concentrations ($\mu\text{g}/\text{m}^3$)									24-Hour PM _{2.5} Concentrations ($\mu\text{g}/\text{m}^3$)									24-Hour PM _{2.5} Concentrations ($\mu\text{g}/\text{m}^3$)								
Date	NCore FRM 1	NCore FRM 2	NCore BAM	A-St FRM	A-St BAM	HURST FRM 1	HURST FRM 2	HURST BAM	Date	NCore FRM 1	NCore FRM 2	NCore BAM	A-St FRM	A-St BAM	HURST FRM 1	HURST FRM 2	HURST BAM	Date	NCore FRM 1	NCore FRM 2	NCore BAM	A-St FRM	A-St BAM	HURST FRM 1	HURST FRM 2	HURST BAM
20	5		3.6	5.1	4	9.5		9.9	12	54		54.4	52.5	54.5	48.7		54.2	1	73.1	71.8	73.5	65.8	69.5	55.7	56	62.4
31	5.4		5	5.2	4.3	13.5		13.8	13	64.1	AF	64.5	62.8	64.2	61.8	60.6	67.6	2	58.4		62.5	46.8	50.7	60.3		68
Black Bolded Values indicate an exceedance of the Annual NAAQS (9 $\mu\text{g}/\text{m}^3$) Red Bolded Values indicate an exceedance of the 24-hour NAAQS (35 $\mu\text{g}/\text{m}^3$) 23 days over 35.5 11 Days over 9 < 35.5 34 Days Total									14	35	36.1	35.4	35	37	35.8		40.9	3	65.8		68.8	65.4		87.2		97
									15	21		21.9	20.8	21.7	21.5		24.7	4	67.4		70.3	64		67.1	67.4	76
									16	13.8	14.2	13.7	13.2	12.1	15.6	15.6	18.4	5	107.1		112.2	105.7		102.6		115.7
									18	10.8		10.2	10.3	10.1	10.5		13.3	6	76.3		78.6		78.1	72.5		81.3
									22	24.1	24.9	25.5	23.7	30.9	25	25.2	30.4	7	56.9	57.9	61.7	57	63.2	66	66.6	77.7
									23	33.5		40.3	32.9	36.5	18.2		22.1	8	30.2		31.5		33.7	32.4		37.8
									24	46.2		51.2	40.7	43	23.3		27.8	9	142.3		139.7	140.3	145.5	108.2		117.9
									25	103	104.3	108.2	103.3	110.2	44.2	44.4	50.3	10		71.2	71.8		72.5	61.1	61.6	67.8
									26	66.1		67.3	64.1	66.1	50.9		57.1	11			50.8		49.4	46.2		50
									27	110.1		112.5	104.2	108.9	84.2		93.7	12	46.5		47.8	45.7	46.9	44.7		50.5
									28	216.8	230.2	208	215.6	198.8	174.8	176.1	175.2	13	27.1	27.3	28	27.2	29.5	27	26.1	33.3
									29			60.6		61.8			56.8	15	9		9.1	8.8	9.3	10.2		12.8
									30	94.5		92.2	84.2	89.9	75.5		84.3									

Table A-3. 2023 Wildland Fire Season FNSB PM_{2.5} Concentraions, µg/m³

July 2023									August 2023								
24-Hour PM _{2.5} Concentrations (µg/m ³)									24-Hour PM _{2.5} Concentrations (µg/m ³)								
Date	NCore FRM 1	NCore FRM 2	NCore BAM	A-St FRM	A-St BAM	HURST FRM 1	HURST FRM 2	HURST BAM	Date	NCore FRM 1	NCore FRM 2	NCore BAM	A-St FRM	A-St BAM	HURST FRM 1	HURST FRM 2	HURST BAM
24	18.1	18.6	18.4	18.3	16.1	18.6	18.5	14.9	1	7.3	5.9	4.8	5.4	5.4	10.5	10.3	9.7
25	14.5		13.5	14	13.9	15.3		12.1	2	7.1		6.2	7.4	6.7	17		15.2
26	18.3		18	17.4	19.1	19		16.3	3	17.4		17.8	18	17.7	43.5		45.9
27	19.2		19.1	18.4	18.3	16.1		13.4	4	27	27.0	27.2	25.8	21.3	35	34.1	30.6
28	26.2		24.8	25.7	26.2	31.1		29.3	5	46.5		47.1	45.8	45.2	56.1		56.4
29	8.2	8.3	8.4	8.3	9.4	13.4		12.4	6	107.7		107.3	108.5	109.2	120.3		122.5
30	2.4		2.1	2.7	2.4	11		9.7	7	156.2		137.5		143.8	141.6	140.5	141.8
Black Bolded Values indicate an exceedance of the Annual NAAQS (9 µg/m ³) Red Bolded Values indicate an exceedance of the 24-hour NAAQS (35 µg/m ³) 7 days over 35.5 14 Days over 9 < 35.5 21 Days Total									8	88.2	60.6	57.7	57.9	53.8	62.6		54.6
									9	83.1		81.2	82.8	81.3	100.2		99
									10	110.3	113.5	98.9	108.2	105.4	82.7	95	92
									11	30.8		28.2	29.2	28.1	32		30.2
									12	21		18.7	21.8	20.6	11.7		8.8
									15	10.0		8.5	9.0	8.8	9.1		7.0
									19	6.9	7.9	6	7.0	6.9	6.1	9.5	4.3

A3. CONTRIBUTION FROM INTERNATIONAL SOURCES

PM_{2.5} concentration measured at Alaska monitors is impacted by international emissions generated in the Russian Far East and Siberia, East Asia, Canada and Europe, along with international marine traffic conducting trade between North America and Asia. Figure A1 shows the geographical proximity of Alaska to neighboring countries.

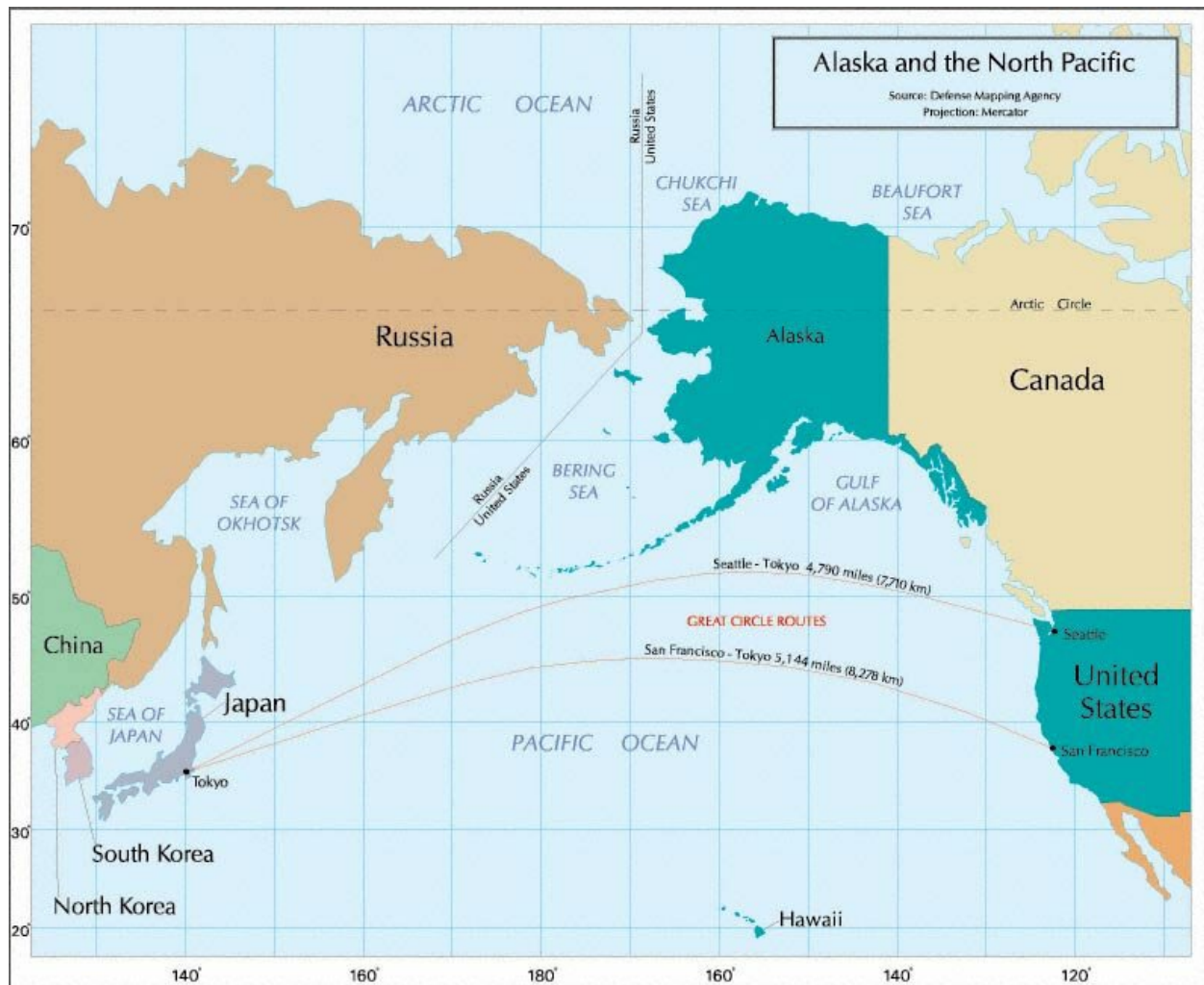


Figure A1. Geographic proximity of Alaska to Russia, Canada, and East Asian countries.