2018

Annual Air Quality Monitoring Network Plan

Alaska Department of Environmental Conservation

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Air Quality Division

Air Monitoring
&
Quality Assurance
Program

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EXECUTIVE SUMMARY

This 2018 Annual Monitoring Plan describes the Alaska air quality monitoring network under the Alaska's Department of Environmental Conservation (DEC) oversight and spells out anticipated changes to the network for the calendar year 2019.

Most of the air monitoring activities are focused on population centers and areas that have shown in the past to have air quality problems. Due to budget cuts over the past several years DEC has reduced the ambient monitoring network to include mostly only regulatory required sites. Looking ahead, DEC does not expect to be extending the network significantly during the next five years due to fiscal constraints.

DEC will discontinue the ozone monitoring in the Anchorage MSA, which means the ozone site in Palmer will be dismantled. DEC anticipates operations in July 1, 2018 for the new Special Purpose Monitoring (SPM) site for $PM_{2.5}$ and PM_{10} in Bethel.

1 INTRODUCTION

The Code of Federal Regulations (CFR) Title 40 §58.10 requires each state agency to adopt and submit to the U.S. Environmental Protection Agency (EPA) Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network made up of the following types of monitoring stations:

- State and local air monitoring stations (SLAMS) including monitors that are designated as:
  - Federal Reference Method (FRM), or
  - Federal Equivalent Method (FEM)
- National Core Multi-pollutant Monitoring Stations (NCore)
- $PM_{2.5}$ Chemical Speciation Network (CSN), and
- Special Purpose Monitoring (SPM) stations.

The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR 58 where applicable.

The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA. Any annual monitoring network plan that proposes SLAMS network modifications, including new monitoring sites, is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, and has submitted the received comments together with the plan, the Regional Administrator is not required to provide a separate opportunity for comment.

This 2018 Annual Monitoring Plan describes the Alaska air quality monitoring network under the State's oversight and spells out anticipated changes to the network for the calendar year 2019. This plan shall include all required stations to be operational by January 1, 2019. Specific locations for the required monitors shall be included in the annual network plan which is due to be submitted to the EPA Regional Administrator by July 1, 2018.

The annual monitoring network plan must contain the following information for each existing and proposed site:

1. The AQS site identification number,
2. The location, including street address and geographical coordinates,
3. The sampling and analysis method(s) for each measured parameter,
4. The operating schedules for each monitor,
5. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal,

6. The minimum monitoring requirements for spatial scale of representativeness for each monitor as defined in 40 CFR 58, Appendix D,
7. The minimum monitoring requirements for probe and monitoring path siting criteria as defined in 40 CFR 58, Appendix E,
8. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in 40 CFR 58.30,
9. The Metropolitan Statistical Area, Core-Based Statistical Area, Combined Statistical Area or other area represented by the monitor,
10. The designation of any lead monitors as either source-oriented or non-source-oriented according to 40 CFR 58, Appendix D,
11. Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of 40 CFR 58, Appendix D,
12. Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM_{10} monitoring in lieu of lead total suspended particulate (Pb-TSP) monitoring as allowed for under paragraph 2.10 of 40 CFR 58, Appendix C.

2 AIR QUALITY MONITORING PRIORITIES

In 1970 the Congress of the United States created the U.S. Environmental Protection Agency (EPA) and promulgated the Clean Air Act (CAA). Title I of the CAA established National Ambient Air Quality Standards (NAAQS) to protect public health. NAAQS were developed for six *criteria pollutants*: particulate matter (PM), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb). Particulate matter has two associated NAAQS: one for fine particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$) and one for coarse particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}). Threshold limits established under the NAAQS to protect human health are known as primary standards. The primary health standards are to protect the most sensitive of the human population, including those people with existing respiratory or other chronic health conditions, children, and the elderly. Secondary standards established under the NAAQS are to protect the public welfare and the environment. Since promulgation of the original CAA, the EPA has continued to revise the NAAQS based on its assessment of national air quality trends and on current (and ongoing) health studies.

To protect public health and assess attainment with NAAQS, DEC established an air quality monitoring program. The State of Alaska has a large geographical area with a small population. Anchorage and the Matanuska-Susitna (Mat-Su) Valley have the bulk of the 710,231[1] residents in the state, about 54% of the overall population. The remainder of the population is distributed among the cities of Juneau and Fairbanks with populations of about 30,000-40,000 and many

[1] Population data obtained from the 2010 US Census, http://live.laborstats.alaska.gov/cen/dp.cfm

scattered and isolated small villages, most of which are off the road system and have populations ranging from 16 to 10,000 people. The total area of the state is approximately 665,384 square miles (1.7 million square kilometers)[2].

In accordance with the National Monitoring Strategy, DEC plans air monitoring activities using the following criteria:

- Monitor in larger communities to cover the largest possible population exposure;
- Monitor in designated smaller towns and villages that are representative of multiple communities in a region; and
- Monitor in response to air quality concerns.

The Air Monitoring & Quality Assurance (AMQA) program of the DEC Air Quality Division has a relatively small staff of professionals who conduct the State's air quality assessment efforts. To enhance the quality of work performed statewide, DEC's staff works closely with the Municipality of Anchorage (MOA), the Fairbanks North Star Borough (FNSB), the Matanuska-Susitna Borough, the City & Borough of Juneau (CBJ), and environmental staff in other, smaller communities to assess air quality levels statewide. To continue to protect public health and the environment, air quality monitoring is focused on seven primary issues by descending priority:

1. Fine particulate matter ($PM_{2.5}$) monitoring
2. Coarse particulate matter (PM_{10}) monitoring
3. Wildland fire monitoring ($PM_{2.5}$)
4. Carbon monoxide (CO) monitoring
5. Rural communities and tribal village monitoring (primarily PM_{10})
6. Lead (Pb) monitoring
7. Ozone (O_3) monitoring

3 STATE OF ALASKA AMBIENT AIR MONITORING NETWORK

3.1 MINIMUM MONITORING REQUIREMENTS

Minimum monitoring requirements are based on several factors including pollutant levels and populations in statistically defined metropolitan areas. The definitions for the statistical based metropolitan areas are provided by the US Office of Management and Budget (OMB) and the Census Bureau (Census).

Alaska has four statistical areas as designated by OMB in 2009 which boundaries are based on the 2013 Census data[3]. The four Core Based Statistical Areas (CBSA) include two Metropolitan

[2] https://www.census.gov/geo/reference/state-area.html#n1
[3] https://www2.census.gov/geo/maps/metroarea/stcbsa_pg/Feb2013/cbsa2013_AK.pdf

Statistical Areas (MSA) and two Micropolitan Areas (μSA), see Table 3-1 below. The two MSAs are the Anchorage MSA which includes the entire Municipality of Anchorage and the entire Matanuska-Susitna Borough. The Fairbanks MSA is comprised of the Fairbanks North Star Borough. The two Micropolitan Areas are the Juneau μSA and the Ketchikan μSA, which encompass the City and Borough of Juneau and the Ketchikan Gateway Borough, respectively.

Table 3-1: Alaska's Core Based Statistical Areas

Core Based Statistical Areas	Population*	Includes:	
Anchorage, MSA	380,821	Municipality of Anchorage	291,826
		Matanuska- Susitna Borough	88,995
Fairbanks, MSA	97,581		
Juneau, μSA	31,275		
Ketchikan, μSA	13,477		

*(based on 2010 Census Data)

The minimum number of sites required for the Alaskan CBSAs for the six criteria pollutants are summarized for the Alaska network in Table 3-2. No monitoring is required for lead anywhere in the Alaskan CBSAs. No air quality monitoring sites are currently required for the Ketchikan μSA.

Monitoring in the Juneau μSA focusses on particulate matter monitoring. One monitoring site is required for PM_{10} based on the PM_{10} Limited Maintenance Plan. The Mendenhall Valley had been designated as a PM_{10} non-attainment area and since has met the standard. No $PM_{2.5}$ monitoring site is required however a single semi-continuous $PM_{2.5}$ monitor is used to issue burn curtailments by the local government. A filter-based monitor is collocated with it to fulfill Network collocation requirements.

CO monitoring is required in the Anchorage and Fairbanks MSAs based on the Limited Maintenance Plans for the MSAs. Both areas had been previously designated as non-attainment and have been able to lower their concentrations.

The Anchorage MSA also triggered the PM_{10} monitoring requirement of 3 to 4 monitors based on elevated concentrations in 2016 (see Table E-3). The exceedances result from high wind events that pick up dust from frozen but not snow-covered braided river beds occur semi regularly. DEC has flagged the events in AQS and has amassed relevant supporting evidence for exceptional event waiver requests. As EPA and the state are currently focused on $PM_{2.5}$, DEC plans to prepare EEWRs for the events when EPA starts another PM_{10} designation process and/or if EPA requests that DEC submit them for approval. Thus, DEC requests that exceptional events not be used to calculate minimum requirements for the Anchorage MSA and that the all sites be considered medium concentration. Table 3-2 excludes the Mat-Su 2016 high wind event.

There is currently no requirement for $PM_{2.5}$ monitoring in the Anchorage MSA. The minimum requirement for $PM_{2.5}$ monitoring in the Fairbanks MSA is for at least one monitoring site, based on the elevated concentrations measured in Fairbanks and North Pole.

Table 3-2: Minimum Monitoring Requirements for Alaskan CBSAs

Criteria Pollutant		SLAMS site requirement			
		Anchorage MSA	**Fairbanks MSA**	**Juneau µSA**	**Ketchikan µSA**
$PM_{2.5}$	Most recent 3 year design value ≥ 85% of NAAQS	1	1	0	0
	Most recent 3 year design value < 85% of NAAQS	0	0	0	0
PM_{10}		1-2*	0-1	0**	0
Pb	Waiver for source oriented monitoring - see section 3.1.1	0	0	0	0
CO	Two monitoring sites based on CO Limited Maintenance Plans (Fairbanks and Anchorage)	0	0	0	0
O_3	Most recent 3 year design value ≥ 85% of NAAQS	0	0	0	0
	Most recent 3 year design value < 85% of NAAQS	1	0	0	0
SO_2		0	0	0	0
NO_2		0	0	0	0

*Concentration is moderate with High Winds Exceptional events days removed
**One (collocated) monitoring site based on PM_{10} Limited Maintenance Plan and to satisfy network collocation requirements

3.1.1 LEAD

After consultation with EPA, DEC decided to pursue a modeling demonstration to show that lead concentrations at the ambient boundary of the Red Dog Mine meet the new lead standard. On August 11, 2016 EPA approved the State of Alaska's waiver request for lead monitoring at the Red Dog Mine based on the results of dispersion modeling. The results of the modeling showed that the maximum ambient air 3-month rolling average lead concentration at the mine did not exceed 50 percent of the lead NAAQS. Pursuant to 40 CFR Part 58, Appendix D, section 4.5(a)(ii), this waiver must be renewed every 5 years as part of the Alaska 5-year Air Monitoring Network Assessment. A copy of the EPA approval letter can be found at http://dec.alaska.gov/media/10608/red-dog-mine-lead-monitoring-waiver-letter-epa-081116.pdf.

3.1.2 APPENDIX D & E SITING FORMS

In 2014 EPA Region 10 provided network evaluation forms to determine compliance with design and minimum monitoring requirements for each of the criteria pollutants under 40 CFR 58, Appendix D. These evaluation forms were reviewed and updated, when necessary, in 2018 by DEC and are presented in **Appendix A**. In 2014 EPA Region 10 provided siting evaluation forms to determine compliance with siting requirements for each of the criteria pollutants under 40 CFR 58, Appendix E. These site evaluation forms were reviewed and updated, when necessary, in 2018 by DEC and are summarized by MSA in **Appendix B**.

3.2 CURRENT MONITORING SITES

DEC operates and maintains a number of ambient air monitoring networks throughout the Alaska. Table 3-3 provides the site name, address, geographic coordinates, and identification number for all the air monitoring sites for which data are submitted to the EPA Air Quality System (AQS) database as of January 1, 2018. NCore parameters measured are PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, CO, O_3, SO_2, NO_2, NO, NOx, NOy, CSN and meteorological parameters.

Table 3-3: AQS Monitoring Sites as of January 2018

Site Name/ Monitoring Objective	Address	Latitude/Longitude*	AQS Identification	Agency
Garden	3000 East 16th Ave. Anchorage, AK	61.205861N 149.824602W	02-020-0018	DEC
Laurel	4335 Laurel St. Anchorage, AK	61.181312N 149.834083W	02-020- 0045	DEC
Parkgate	11723 Old Glenn Hwy. Eagle River, AK	61.326700N 149.569707W	02-020-1004	DEC
State Office Building	675 Seventh Ave. Fairbanks, AK	64.840833N 147.723056W	02-090-0010	DEC
NCore (NCore and CSN site)	809 Pioneer Road Fairbanks, AK	64.845307N 147.72552W	02-090-0034	DEC
North Pole Fire Station #3	3288 Hurst Rd. North Pole, AK	64.762973N 147.310297W	02-090-0035	DEC
Peger (met only)	3175 Peger Rd. Fairbanks, AK	64.81923333 147.778083W	02-090-4010	DEC
Butte	Harrison Court Butte, AK	61.534100N 149.0351855W	02-170-0008	DEC
Palmer (regional background site)	South Gulkana St. Palmer, AK	61.599322N 149.103611W	02-170-0012	DEC
Floyd Dryden Middle School	3800 Mendenhall Loop Road Juneau, AK	58.388889N 134.565556W	02-110-0004	DEC

*Coordinates for latitude and longitude are consistent with the World Geodetic System (WGS 84).

3.3 SITING CRITERIA

In 2014 EPA Region 10 provided site evaluation forms to determine compliance with 40 CFR 58 (**Appendix E**) requirements for monitoring path and siting criteria. These forms were distributed to the individual site operators for completion. Summaries of the site evaluation forms are presented in three tables – PM, CO and all other gaseous pollutants – in **Appendix B** of this report. Monitoring site photos and location maps can be found at: http://dec.alaska.gov/air/air-monitoring/monitoring-site-information/.

3.3.1 CARBON MONOXIDE SITES

Carbon monoxide (CO) inlet probes should be at least 1 meter away, both vertically and horizontally, from any supporting structure or wall. For micro-scale sites the probe height must be between 2.5 and 3.5 meters, whereas for other scale sites the probe must be between 3 and 15 meters high.

A probe must have unrestricted airflow for at least 270 degrees, or 180 degrees if it is located on the side of a building. Obstructions must be a minimum distance away equal to twice the distance by which the height of the obstruction exceeds the height of the probe. Trees should not be present between the dominant CO source or roadway and the inlet probe.

The following table (Table 3-4) lists all CO monitoring sites in Anchorage and Fairbanks and how they fit the siting criteria from Appendix E of 40 CFR Part 58.

Table 3-4: CO Monitoring Sites in Anchorage and Fairbanks May 2018

Site Name	Monitoring Scale	Probe Distance from Wall (meters)	Height (meters)	Unrestricted Air Flow	Spacing from Roadway (meters)	Trees
Garden 02-020-0018	Neighborhood	1	3	180 degrees unobstructed	7	Yes
NCore 02-090-0034	Neighborhood	Not applicable	5	360 degrees unobstructed	85	None

3.3.2 PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$) SITES

For micro-scale sites particulate matter inlets must be between 2 and 7 meters from ground level. For other siting scales the probe must be between 2 and 15 meters high.

A sampler must have at least 2 meters separation from walls, parapets, penthouses, etc. A sampler must have unrestricted airflow for at least 270 degrees, or 180 degrees for street canyon sites. Obstructions must be a minimum distance away from the sampler with the separation

equal to twice the distance by which the height of the obstruction exceeds the height of the sampler inlet.

Micro-scale sampler inlets must be located between 5 and 15 meters from the nearest traffic lane for traffic corridor sites, and between 2 and 10 meters for street canyon sites. The minimum separation distance between the probe and nearest traffic lane for middle, neighborhood, or urban scale sites depends upon the number of vehicles per day (VPD) that use the roadway according to a rather complicated table in Appendix E of 40 CFR Part 58. Table 3-5 lists all PM monitoring sites in Alaska and how they fit the siting criteria from Appendix E of 40 CFR Part 58 (also see Appendix B).

Table 3-5: PM Monitoring Sites in Alaska as of January 2018

Site Name	Monitoring Scale	Height (meters)	Spacing from Obstructions (meters)	Spacing from Roadway (meters)	Traffic (VPD)	Trees
Garden 02-020-0018	Neighborhood	8	12m to 5m tall penthouse	14	< 5,000	None
Laurel 02-020-0045	Microscale	7	None	15	35, 000	None
Parkgate 02-020-1004	Neighborhood	6	13m to 4m tall penthouse	44	11,000	None
Butte 02-170-0008	Neighborhood	4	> 8	150	Old Glenn Hwy, 5,891*	None
Palmer 02-170-0012	Neighborhood	4	None	>20	Unknown, probably < 5,000	None
State Office Building 02-090-0010	Neighborhood	6	30m to 3.75m tall penthouse	20	7,400	None
NCore 02-090-0034	Neighborhood	4	75 m to 12 m building	70	3,559	None
North Pole Fire #3 02-090-0035	Neighborhood	4	None	23 to Hurst Rd	3,730	> 30
Floyd Dryden 02-110-0004	Neighborhood	7	Furnace flue @ 20m, 4m penthouse @ 15m	65	12,770	12 m tall 25m away

* McKechnie Loop has only local neighborhood traffic and site is at the dead end of Harrison Court (with three houses).

3.4 NCore Site

The NCore site pollutant monitors listed in Table 3-6 are representative at a neighborhood scale. Meteorological monitoring is representative at a microscale. Table 3-6 also lists additional relevant siting information.

Table 3-6: NCore Gaseous* Monitoring and Meteorological Monitoring as of January 2018 in Alaska

Parameter Name	Monitoring Scale	Height (meters)	Spacing from Obstructions (meters)	Spacing from Roadway (meters)	Traffic (VPD)	Trees
NOy, NO & diff	Neighborhood	4	75 m to 12 m building	85	3,559	None
NO_2, NOx & NO	Neighborhood	4	75 m to 12 m building	85	3,559	None
O_3	Neighborhood	4	75 m to 12 m building	85	3,559	None
SO_2 (1 hr & 5 min)	Neighborhood	4	75 m to 12 m building	85	3,559	None
T_{amb}, WS & WD (2 m)	Microscale	2	75 m to 12 m building	85	3,559	None
T_{amb}, WS & WD (10 m)	Microscale	10	75 m to 12 m building	85	3,559	None
Relative Humidity	Neighborhood	2	75 m to 12 m building	85	3,559	None
Barometric Pressure	Neighborhood	4	75 m to 12 m building	85	3,559	None

* Excluding CO and O_3.

3.5 Monitoring Methods, Designation and Sampling Frequency

Tables 3-7 to 3-13 present information for current sites (and monitors) used in coding the data submitted by DEC to the AQS database. The information provided in Tables 3-7 to 3-13 for each monitoring site includes pollutant parameter name, monitor designation, the AQS parameter codes and parameter occurrence codes (POC), the AQS method code, the frequency of sampling, and the instrumentation used. The monitor designation states the purpose for which the data are to be used, such as: for State & Local Air Monitoring Stations (SLAMS) to demonstrate NAAQS compliance, Special Purpose Monitoring sites (SPM) for general air quality assessments, and the Chemical Speciation Network (CSN) for atmospheric chemistry assessments. AQS parameter, method and units codes are specific to the pollutant, instrumentation, and sampling equipment

used, and how the concentration units are expressed in either local conditions or corrected to standard conditions for temperature and pressure. The 5-digit parameter code identifies the parameter being measured e.g. PM_{10}, SO_2, or wind speed. The 1-digit POC code is the parameter occurrence code. As suggested by Region 10 EPA, DEC uses the POC to indicate whether the sampler or instrument is (1) a primary data source, or (2) a secondary data source such as a collocated sampler, or (3) that an instrument is measuring on a continuous basis. The AQS method code provides information specific to the analytical technique used for the pollutant determination such as instrumental analysis using chemiluminescence for nitric oxide or gravimetric analysis for particulate. The notation presented in the sample frequency indicates how often the pollutant concentration is determined. For example, 1/6 indicates that one sample is collected every sixth day according to the national EPA air monitoring schedule. Continuous indicates that an instrument is continuously analyzing a sample stream providing a pollutant concentration on a real-time basis (e.g. 1-min SO_2 reading) or a near-real time basis (e.g. 1-hour $PM_{2.5}$ reading from a beta attenuation monitor, a BAM). The equipment information column identifies on-site equipment (either a sampler or instrument) specific to the AQS parameter code.

Other monitoring sites operated by DEC to gather data related to rural road dust and wildland fires, but that are not submitted to the AQS database are discussed in **Appendix C**. The IMPROVE monitoring sites operated in Alaska under the federal program to characterize and protect scenic visibility around National Parks and designated wilderness areas are described in **Appendix D**.

A summary of pollutant concentration data calculated as NAAQS design values, maxima, or as averages are presented in **Appendix E**. Table E-1 and E-2 summarize the annual 98^{th} percentile concentrations, and annual and 24 hour design values for the $PM_{2.5}$ network. Table E-2 excludes those values caused by exceptional events which EPA has already concurred with and for which DEC has made application for concurrence. Table E-1 shows the values calculated excluding the 2015 summer wildfire exceedances, which EPA has not yet concurred with. In the highly unlikely event that EPA does not concur with DEC's 2015 Exceptional Event Waiver Request this table (E-2) will be correct.

Table 3-7: Anchorage MSA: AQS Codes as of April 2018; STD = standard conditions of temperature and pressure; LC = local (actual) conditions of temperature and pressure

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
Garden Site/ Anchorage 02-020-0018	PM_{10STD}/ PM_{10LC}	SLAMS	1/1/2009 01/01/2015	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X Coarse
	$PM_{2.5LC}$	SLAMS	1/1/2009	88101-3	170	Continuous	Met-One BAM 1020X Coarse
	CO	SLAMS	1/1/1979	42101-1	554	Continuous (Oct-Mar)	Thermo Scientific. Inst. Model 48i
Laurel/ Anchorage 02-020-0045	PM_{10STD}/ PM_{10LC}	SPM	5/28/2015	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X
Parkgate/ Eagle River 02-020-1004	PM_{10STD}/ PM_{10LC}	SLAMS	1/1/2009 STD 01/01/2015 LC	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X Coarse
	$PM_{2.5LC}$	SLAMS	1/1/2009	88101-3	170	Continuous	Met-One BAM 1020X Coarse
Palmer/Mat-Su	PM_{10STD}/ PM_{10LC}	SPM	1/1/2010	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X Coarse

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
Palmer/ Matanuska-Susitna Valley 02-170-0012	$PM_{2.5LC}$	SPM	1/1/2010	88101-3	170	Continuous	Met-One BAM 1020X Coarse
	O_3	SPM	4/1/2015	44201-1	87	Continuous Seasonal Apr - Oct	Teledyne API 400E
Butte/ Matanuska-Susitna Valley	PM_{10STD}/ PM_{10LC}	SPM	4/11/1998	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X Coarse
02-170-0008	$PM_{2.5LC}$	SLAMS	8/10/2011	88101-3	170	Continuous	Met-One BAM 1020X Coarse

Table 3-8: FNSB monitors: AQS Codes as of April 2018; STD = standard conditions of temperature and pressure; LC = local (actual) conditions of temperature and pressure

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
State Office Building/ Fairbanks 02-090-0010	$PM_{2.5LC}$	SLAMS	10/23/1998	88101-1	145	1/1	Thermo Scientific Sequential Partisol 2025i
NCore/ Fairbanks 02-090-0034	PM_{10STD}/ PM_{10LC}	NCORE	2/15/2011	81102-3/ 85101-3	122	Continuous	Met-One BAM 1020X Coarse
	$PM_{2.5LC}$	NCORE	2/15/2011	88101-3	170	Continuous	Met-One BAM 1020X Coarse
	PM_{10STD}/ PM_{10LC}	NCORE	11/10/2012	81102-1/ 85101-1	126	1/3	Thermo Scientific Partisol 2000i
	$PM_{2.5LC}$	NCORE	11/4/2009	88101-1	143/145	1/1[1]	Thermo Scientific Sequential Partisol 2025i (&2000i until 5/24)
	PM_{10LC} - $PM_{2.5LC}$	NCORE	2/15/2011	86101-1	175/176	1/3	paired Thermo Scientific Partisol 2000i/2025i
	CO	NCORE	8/1/2011	42101-1	554	Continuous	Thermo Scientific 48i
	SO_2 (1-hr)	NCORE	8/1/2011	42401-1	560	Continuous	Thermo Scientific 43i-TL

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
NCore/ Fairbanks 02-090-0034	SO_2 (5-min)	NCORE	8/18/2011	42401-2	560	Continuous	Thermo Scientific 43i-TL
	NO_Y	NCORE	01/01/2013 10/5/12 AQS	42600-1	674	Continuous	Thermo Scientific 42iY-TL
	NO	NCORE	10/5/2012	42601-2	574	Continuous	Thermo Scientific 42iY-TL
	NO_Y-NO	NCORE	10/5/2012	42612-1	674	Continuous	Thermo Scientific 42iY-TL
	NO_X	NCORE	3/1/2014	42603-1	574	Continuous	Thermo Scientific 42i-TL
	NO	NCORE	3/1/2014 10/5/2012	42601-1	574	Continuous	Thermo Scientific 42i-TL
	NO_2	NCORE	3/1/2014	42602-1	574	Continuous	Thermo Scientific 42i-TL
	O_3	NCORE	8/1/2011	44201-1	87	Continuous	Teledyne API 400E
	WD[2]	NCORE	4/5/2011	61104-1	061	Continuous	Met-One Sonic Anemometer
	WS[2]	NCORE	4/5/2011	61103-1	061	Continuous	Met-One Sonic Anemometer

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
NCore/ Fairbanks 02-090-0034	BP	NCORE	4/5/2011	64101-1	014	Continuous	Met-One BAM 1020X Barometer
	RH	NCORE	11/4/2013	62201	061	Continuous	Met-One BAM 1020X Relative Humidity Sensor
	Ambient Temp @ 2 m	NCORE	4/1/2011	62101-2	061	Continuous	Met-One Temp Sensor
	Ambient Temp @ 10 m	NCORE	4/1/2011	62101-1	061	Continuous	Met-One Temp Sensor
	$PM_{2.5LC}$ Speciation	CSN	1/1/2015	Multiple[3]	Multiple[3]	1/3	URG 3000N
	$PM_{2.5LC}$ Speciation	CSN	1/1/2015	Multiple[3]	Multiple[3]	1/3	Met-One Super SASS $PM_{2.5}$ LC
North Pole Fire #3/ North Pole 02-090-0035	$PM_{2.5LC}$	SLAMS	3/1/2012	88101-1	145	1/3	Thermo Scientific Sequential Partisol 2025i
	$PM_{2.5LC}$	SLAMS	3/1/2012	88501-3/ 88502-3	170	Continuous	Met-One BAM 1020X
	PM2.5LC collocated	SLAMS	5/8/2013	88101-2	143	1/6	Thermo Scientific Partisol 2000i

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
Peger Rd Met 02-090-4010	Ambient Temp @ 3 m	SPM	9/5/2017	62101-2	061	Continuous	Met-One Temp Sensor
	Ambient Temp @ 10 m	SPM	9/5/2017	62101-1	061	Continuous	Met-One Temp Sensor
	WD[2] @10 m	SPM	9/5/2017	61104-1	061	Continuous	Met-One Sonic Anemometer
	WS[2] @ 10 m	SPM	9/5/2017	61103-1	061	Continuous	Met-One Sonic Anemometer
	Ambient Temp @ 30 m	SPM	9/5/2017	62101-3	061	Continuous	Met-One Temp Sensor
	WD@ 30 m	SPM	9/5/2017	61104-3	061	Continuous	Met-One Sonic Anemometer
	WS @ 30 m	SPM	9/5/ 2017	61103-3	061	Continuous	Met-One Sonic Anemometer

[1]WD and WS are reported as resultant
[2]Multiple AQS codes are used to identify individual chemical species

Table 3-9: Juneau μSA: AQS Codes as of April 2018; STD = standard conditions of temperature and pressure; LC = local (actual) conditions of temperature and pressure

Site Name/Location	Pollutant Parameter	Monitor Designation	Monitor Starting Date	AQS Parameter and Occurrence Code	AQS Method Codes	Sample Frequency	Equipment
Floyd Dryden Middle School/ Juneau 02-110-0004	PM_{10STD}/ PM_{10LC}	SLAMS	1/1/1986	81102-1/ 85101-1	126	1/6	Thermo Scientific Partisol 2000i
	PM_{10STD}/ PM_{10LC}	SLAMS collocated	1/1/1986	81102-2/ 85101-2	126	1/6	Thermo Scientific Partisol 2000
	$PM_{2.5LC}$	SLAMS	8/21/2009	88101-3	170	Continuous	Met-One BAM 1020X
	$PM_{2.5LC}$	SLAMS collocated	4/1/2015	88101-1	143	1/6	Thermo Scientific Partisol 2000i

Table 3-10: Anchorage MSA Instrument-Level Monitoring Objectives

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
Garden Site/ Anchorage 02-020-0018	PM_{10STD}/ PM_{10LC}	81102-3/ 85101-3	122	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Determine ambient air quality standard compliance	No
	$PM_{2.5LC}$	88101-3	170	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Determine ambient air quality standard compliance	No
	CO	42101-1	554	Thermo Scientific Model 48i	-Provide timely air pollution information -Determine ambient air quality standard compliance	Yes
Laurel/ Anchorage 02-020-0045	PM_{10STD}/ PM_{10LC}	81102-3/ 85101-3	122	Met-One BAM 1020X	-Provide timely air pollution information -Determine ambient air quality standard compliance	No
Parkgate/ Eagle River 02-020-1004	PM_{10STD}/ PM_{10LC}	81102-3/ 85101-3	122	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Determine ambient air quality standard compliance	Yes
Parkgate/ Eagle River 02-020-1004	$PM_{2.5LC}$	88101-3	170	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Determine ambient air quality standard compliance	No

Table 3-11: FNSB Instrument-Level Monitoring Objectives

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
State Office Building/ Fairbanks 02-090-0010	$PM_{2.5LC}$	88101-1	143	R & P Partisol 2000	-Determine ambient air quality standard compliance	Yes
NCore/ Fairbanks 02-090-0034	PM_{10STD}/ PM_{10LC}	81102-3/ 85101-3	122	Met-One BAM 1020X Coarse	-Provide timely air pollution information - Determine ambient air quality standard compliance -Support air pollution research studies	No
	$PM_{2.5LC}$	88101-3	170	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Support air pollution research studies	Yes
	PM_{10STD}/ PM_{10LC}	81102-1/ 85101-1	126	Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance -Support air pollution research studies	No
	$PM_{2.5LC}$	88101-1	143	Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance -Support air pollution research studies	Yes
	PM_{10LC} - $PM_{2.5LC}$	86101-1	175	paired Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance -Support air pollution research studies	Yes
	CO	42101-1	554	Thermo Scientific 48i	-Provide timely air pollution information -Determine ambient air quality standard compliance -Support air pollution research studies	Yes
	SO_2 (1-hr)	42401-1	560	Thermo Scientific 43i-TL	-Provide timely air pollution information -Determine ambient air quality standard compliance -Support air pollution research studies	Yes
	SO_2 (5-min)	42401-2	560	Thermo Scientific 43i-TL	-Determine ambient air quality standard compliance -Support air pollution research studies	Yes

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
NCore/ Fairbanks 02-090-0034	NO_Y	42600-1	674	Thermo Scientific 42iY-TL	-Support air pollution research studies	Yes
	NO	42601-1	674	Thermo Scientific 42iY-TL	-Support air pollution research studies	Yes
	NO_Y-NO	42612-1	674	Thermo Scientific 42iY-TL	-Support air pollution research studies	No
	NO_X	42603-1	574	Thermo Fisher 42i-TL	-Support air pollution research studies	No
	NO	42601-2	674	Thermo Scientific 42i-TL	-Support air pollution research studies	No
	NO_2	42602-1	574	Thermo Scientific 42i-TL	-Provide timely air pollution information -Determine ambient air quality standard compliance -Support air pollution research studies	No
	O_3	44201-1	087	Teledyne API 400E	-Provide timely air pollution information -Determine ambient air quality standard compliance -Support air pollution research studies	Yes
	WD	61104-1	061	Met-One Sonic Anemometer	-Provide timely air pollution information -Support air pollution research studies	Yes
	WS	61103-1	061	Met-One Sonic Anemometer	-Provide timely air pollution information -Support air pollution research studies	Yes
	BP	64101-1	014	Met-One BAM 1020X Barometer	-Provide timely air pollution information. -Support air pollution research studies	No
	RH	62201-1	061	Met-One RH Sensor	-Provide timely air pollution information. -Support air pollution research studies	Yes

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
	Ambient Temp @ 2 m	62101-2	061	Met-One Temp Sensor	-Provide timely air pollution information. -Support air pollution research studies	Yes
	Ambient Temp @ 10 m	62101-1	061	Met-One Temp Sensor	-Provide timely air pollution information. -Support air pollution research studies	No
	$PM_{2.5LC}$ Speciation	Multiple*	Multiple*	URG 3000N	-Support air pollution research studies -part of CSN	Yes
	$PM_{2.5LC}$ Speciation	Multiple*	Multiple*	Met-One Super SASS $PM_{2.5}$ LC	-Support air pollution research studies -Part of CSN	Yes
North Pole Fire #3/ North Pole 02-090-0035	$PM_{2.5LC}$	88101-1	143	Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance	Yes
	$PM_{2.5LC}$	88501-3/ 88502-3	170	Met-One BAM 1020X	-Provide timely air pollution information -	Yes
	$PM_{2.5LC}$ collocated	88101-2	143	Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance	Yes
Peger Rd Met 02-090-4010	Ambient Temp @ 3,10 & 30 m	62101-2,1,3	061	Met-One Temp Sensor	-Provide timely air pollution information	No
	WD @ 10 & 30 m	61104-1,3	061	Met-One Sonic Anemometer	-Provide timely air pollution information	No
	WS@ 10 & 30 m	61103-1,3	061	Met-One Sonic Anemometer	-Provide timely air pollution information	No

Table 3-12: Juneau Instrument-Level Monitoring Objectives

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
Floyd Dryden Middle School/ Juneau 02-110-0004	PM_{10STD}/ PM_{10LC} collocated	81102-2/ 85101-2	126	R&P Partisol 2000	-Determine ambient air quality standard compliance	Yes
	$PM_{2.5LC}$	88101-3	170	Met-One BAM 1020X	-Provide timely air pollution information -Determine ambient air quality standard compliance	No
	$PM_{2.5LC}$	88101-2	143	Thermo Scientific Partisol 2000i	-Determine ambient air quality standard compliance	No

Table 3-13: Bethel Instrument-Level Monitoring Objectives

Site Name/ Location	Pollutant Parameter	AQS Parameter and Occurrence Code	AQS Method Code	Equipment	Monitoring Objective (40 CFR 58 Appendix D)	Required due to NAA or Maintenance Plan?
Bethel -	PM_{10STD}/ PM_{10LC}	81102-3/ 85101-3	122	Met-One BAM 1020X Coarse	-Provide timely air pollution information -Determine ambient air quality standard compliance	No
	$PM_{2.5LC}$	88101-3	170	Met-One BAM 1020X	-Provide timely air pollution information -Determine ambient air quality standard compliance	No

4 NETWORK MODIFICATIONS COMPLETED IN 2017

4.1 DAILY $PM_{2.5}$ FRM SAMPLING AT ALL FNSB SLAMS SITES

DEC increased the sampling frequency at all $PM_{2.5}$ FRM SLAMS sampling sites in the FNSB non-attainment area. Daily sampling started at the NCore site on October 26, 2016. Effective January 1, 2017 daily FRM sampling commenced at the Fairbanks downtown State Office Building site (SOB) and at the North Pole Fire Station site on July 1, 2017.

4.2 $PM_{2.5}$ COLLOCATION

A Partisol 2000i $PM_{2.5}$ collocation was moved from the NCore site in Fairbanks to the North Pole Fire Station #3 site to meet colocation requirements for the network in 2017. A Thermo Scientific Sequential Partisol 2025i was received May 7 and anticipated installation at the State Office Building site is June 2018. These two sites will meet collocation requirements for all FRMs in FNSB.

4.3 RURAL ALASKA

DEC has established a Memorandum of Understanding with the City of Bethel. After finalizing site selection for a PM_{10} and $PM_{2.5}$ SPM site in Bethel, DEC shipped the monitoring trailer to Bethel and is currently working to get power and DSL connections established. DEC is planning to install a pair of Met One BAM 1020 PM analyzers, which will report to the State's DR DAS data acquisition system and display the AQI on the DEC website. DEC plans to have the site fully operational by July 1, 2018. DEC will report the data to AQS.

5 PROPOSED NETWORK MODIFICATIONS FOR 2018

5.1 DISCONTINUATION OF OZONE MONITORING IN THE ANCHORAGE MSA

DEC proposed to shutdown ozone monitoring in Palmer and with that eliminate the Anchorage MSA ozone monitoring network in the 2017 Annual Network Plan for calendar year 2018. Due to the delay of the 2017 plan and subsequently the delay of the official EPA approval, DEC continued monitoring during 2018. DEC will dismantle the ozone monitoring site in Palmer after the 2018 monitoring season and therefore cease ozone monitoring in the Anchorage MSA effective January 1, 2019.

Appendix A Network Evaluation Forms

Table A-1 $PM_{2.5}$ Network Evaluation form

PART 58 APPENDIX D NETWORK EVALUATION FORM FOR PM2.5				
STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02 **EVALUATION DATE:** APRIL 24, 2018 **EVALUATOR:** ANNA BREUNINGER				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.7.1(a)	States, and where applicable local agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D-5 of this appendix. Use the form below and Table D-5 to verify if each of your MSAs have the appropriate number of SLAMS FRM/FEM/ARM samplers.	✓		
4.7.1(b)	Each required SLAMS FRM/FEM/ARM monitoring stations or sites must be sited to represent area-wide air quality in the given MSA (typically neighborhood or urban spatial scale, though micro-or middle-scale okay if it represent many such locations throughout the MSA).	✓		
4.7.1(b)(1)	At least one SLAMS FRM/FEM/ARM monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration for each MSA where monitoring is required by 4.7.1(a).	✓		
4.7.1(b)(2)	For CBSAs with a population of 1,000,000 or more persons, at least one FRM/FEM/ARM $PM_{2.5}$ monitor is to be collocated at a near-road NO_2 station.			✓
4.7.1(b)(3)	For MSAs with additional required SLAMS sites, a FRM/FEM/ARM monitoring station is to be sited in an area of poor air quality.	✓		
4.7.2	Each State must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor, in which case no collocation requirement applies.	✓		
4.7.3	Each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor regional transport (note locations in comment field). Non-reference PM2.5 monitors such as IMPROVE can be used to meet this requirement.	✓		
4.7.4	Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the $PM_{2.5}$ Speciation Trends Network (STN).	✓		
Comments:				

MSA Description[1]	MSA population[2,3]	Design Value for years 2015-2017 24-hr/Annual Avg. µg/m3	Minimum required number of PM2.5 SLAMS FRM/FEM/ARM sites (from Table D-5)	Present number of PM2.5 SLAMS FRM/FEM/ARM sites in MSA	Present number of continuous PM2.5 FEM/ARM analyzers in MSA	Present number of continuous PM2.5 STN analyzers in MSA
Combined Municipality of Anchorage and Matanuska-Susitna Valley Borough (MSA)	380,821		1	3 (1 SPM)	4	0
MOA Garden		20/6.1	SLAMS/FEM	1	1	0
MOA Parkgate		15/5.1	SLAMS/FEM	1	1	0
Mat-Su Butte		32/6.1	SLAMS/FEM	1	1	0
Mat-Su Palmer		10/2.9	SPM/ FEM	1	1	0
Fairbanks North Star Borough	97,581		1	4(5)	1*	1 speciation
State Office Building		38/9.6	SLAMS/FRM	1 (2025i to be collocated 2018)	0	0
NCore Site		35/9.3	NCore/FRM	1	1*	1 speciation
North Pole Fire #3		85/15.9	SPM/2 FRM	2 (2000i collocated)	0	0
City and Borough of Juneau	31,275		0	1	1	0
Floyd Dryden		22/6.1	SLAMS/FEM	1	1	

[1]see https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html

[2]Minimum monitoring requirements apply to the metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas.

[3]Population based on latest available census figures.

*MetOne BAM w/ SCC; per discussion with EPA VSCC cyclone removed

Table D-5 of Appendix D to Part 58 – PM2.5 Minimum Monitoring Requirements		
MSA population[1, 2]	Most recent 3-year design value ≥85% of any PM2.5 NAAQS[3]	Most recent 3-year design value <85% of any PM2.5 NAAQS[3, 4]
>1 million	3	2
500K to 1 million	2	1
50K to <500K[5]	1	0

[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
[2]Population based on latest available census figures. https://www.census.gov/
[3]The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4]These minimum monitoring requirements apply in the absence of a design value.
[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table A-2 PM_{10} Network Evaluation form

PART 58 APPENDIX D NETWORK EVALUATION FORM FOR PM10

STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02

EVALUATION DATE: April 18, 2018 **EVALUATOR:** J. STLAURENT

APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.6(a)	Table D-4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM10 air quality trends and geographical patterns. Use the form below and Table D-4 to verify if your PM10 network has to appropriate number of samplers.	✓		

Comments: All of the site locations are based on historical agreements among the EPA, ADEC and (where applicable) local agencies.

One exceedance on April 9, 2016 at Palmer, 24% above the NAAQS at 187µg/m3, causes the entire Anchorage MSA to be categorized as high concentration. DEC qualified the data as RJ (high winds). This single day could be the basis for an EEWR should EPA request DEC or EPA start another PM_{10} designation process. Thus DEC assumes that medium concentration is applicable when this exceptional event is excluded from the compliance calculations (Table E-3).

MSA Description[1]	MSA population[2,3]	Minimum required number of PM10 stations (from Table D-4)	Present number of PM10 stations in MSA
Anchorage MSA	380,821	1-2	5 (2 SLAMS, 3 SPM)
Fairbanks North Star Borough MSA	97,581	0-1	1 (NCore, collocated)
City and Borough of Juneau µSA	31,275	0	1 (SLAMS, collocated)

[1]see http://www2.census.gov/econ/susb/data/msa_codes_2007_to_2011.txt

[2]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas.

[3]Population based on latest available census figures.

Table D-4 of Appendix D to Part 58 – PM10 Minimum Monitoring Requirements

MSA population[1,2]	High concentration[2]	Medium concentration[3]	Low concentration[4,5]
>1 million	6-10	4-8	2-4
500K to 1 million	4-8	2-4	1-2
250K to 500K	3-4	1-2	0-1
100K to 250K	1-2	0-1	0

[1]Selection of urban areas and actual numbers of stations per area will be jointly determined by EPA and the State agency.

[2]High concentration areas are those for which ambient PM10 data show ambient concentrations exceeding the PM10 NAAQS by 20 percent or more.

[3]Medium concentration areas are those for which ambient PM10 data show ambient concentrations exceeding 80 percent of the PM10 NAAQS.

[4]Low concentration areas are those for which ambient PM10 data show ambient concentrations less than 80 percent of the PM10 NAAQS.

[5]These minimum monitoring requirements apply in the absence of a design value.

Table A-3 CO Site Evaluation form

PART 58 APPENDIX D SITE EVALUATION FORM FOR CARBON MONOXIDE (CO)					
STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02 **EVALUATION DATE:** 4-23-2018 **EVALUATOR:** A. BREUNINGER					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
4.2.1(a)	One CO monitor is required to operate collocated with one required near-road NO_2 monitor in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO_2 monitor, only one CO monitor is required to be collocated with a near-road NO_2 monitor within that CBSA.				✓
4.2.2(a)	Has the EPA Regional Administrator required additional CO monitoring stations above the minimum number of monitors required in 4.2.1? If so, note location in comment field.		✓		
Comments: The State of Alaska has no CBSA with a population of 1,000,000. Therefore, there are no near-road collocated sites for CO and NO_2. The Garden Site (AQS ID 02-020-0018) is the single CO site currently operating in the Municipality of Anchorage for Limited Maintenance Plan compliance. A single CO SLAMS monitor operated for Limited Maintenance Plan compliance in the Fairbanks North Star Borough at the Old Post Office Building site (AQS 02-090-0002) until 4/30/2014. Since then the Fairbanks North Star Borough multi-pollutant NCore site (02-090-0034) currently is the single CO site for compliance with NCore requirements and for Limited Maintenance Plan compliance in Fairbanks.					

MSA Description[1]	CBSA population[2,3]	Minimum required number of SLAMS CO sites	Present number of SLAMS CO sites in MSA
Combined Municipality of Anchorage and Matanuska-Susitna Borough	380,821	0	1*
Fairbanks North Star Borough	97,581	0	1*

[1]see http://www2.census.gov/econ/susb/data/msa_codes_2007_to_2011.txt

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures (April 2010).

* Monitoring sites in both MSAs satisfy their respective CO Limited Maintenance Plans requirements

Table A-4 O_3 Network Evaluation form

PART 58 APPENDIX D NETWORK EVALUATION FORM FOR OZONE (O_3)				
STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02 **EVALUATION DATE:** 4-18-2018 **EVALUATOR:** ANNA BREUNINGER				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.1(b)	At least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration (note location in comment field).	✓		
4.1(c)	The appropriate spatial scales for O_3 sites are neighborhood, urban, and regional (note deviations in comment field).	✓		
4.1(f)	Confirm that the monitoring agency consulted with EPA R10 when siting the maximum O3 concentration site.	✓		
4.1(i)	O_3 is being monitored at SLAMS monitoring sites during the "ozone season" as specified in Table D-3 of Appendix D to Part 58.	✓		
Comments: Ozone monitoring was established at the Palmer site (AQS ID 02-170-0012) in the Matanuska-Susitna Valley Borough beginning on April 1, 2015, and has been monitored there year-round since that date. An ozone monitoring site was established in the Fairbanks North Star Borough at the multi-pollutant NCore site (AQS 02-090-0034) in August 2011 and has been operated year-round since then.				

MSA Description	MSA population	Minimum required number of SLAMS O_3 sites (from Table D-2)	Present number of SLAMS O3 sites in CBSA	
Combined Municipality of Anchorage and Matanuska-Susitna Valley Borough (MSAs)	380,821	1	0*	3-years completed in Anchorage Palmer (SPM).4
Fairbanks North Star Borough	97,581	0	1**	1 NCore Site
* see https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html				

* Most recent DV is 2017 Palmer (0.044 ppm) which is less than 59% of the NAAQS; no additional monitoring is required according to Table D-2

** Not SLAMS but NCore requirement

Table D-3 of Appendix D to Part 58—Ozone Monitoring Season by State		
State	Begin month	End Month
Alaska	April	October
Idaho	May	September
Oregon	May	September
Washington	May	September

Table D-2 of Appendix D to Part 58 - SLAMS O_3 Monitoring Minimum Requirements		
MSA population[1, 2]	Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS[3]	Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3, 4]
>10 million	4	2
4-10 million	3	1
350,000-<4 million	2	1
50,000-<350,000[5]	1	0
[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas. [2]Population based on latest available census figures. [3]The ozone (O3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50. [4]These minimum monitoring requirements apply in the absence of a design value. [5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.		

Table A-5 SO_2 Network Evaluation form

PART 58 APPENDIX D NETWORK EVALUATION FORM FOR SULFUR DIOXIDE (SO_2)				
STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02 **EVALUATION DATE:** 4-18-2018 **EVALUATOR:** ANNA BREUNINGER				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.4.1	State and, where appropriate, local agencies must operate a minimum number of required SO_2 monitoring sites (based on PWEI calculation specified in 4.4.2 – use Table 1 and 2 below to determine minimum requirement for each CBSA)	✓		
4.4.2(a)(1)	Is the monitor sited within the boundaries of the parent CBSA and is it one of the following site types: population exposure, highest concentration, source impacts, general background, or regional transport?			✓
4.4.3(a)	Has the EPA Regional Administrator required additional SO_2 monitoring stations above the minimum number of monitors required in 4.4.2? If so, note location in comment field.		✓	
4.4.5(a)	Is your agency counting an existing SO2 monitor at an NCore site in a CBSA with a minimum monitoring requirement?			✓
Comments: As evident from the calculations shown below, the State of Alaska has no CBSAs which require SO_2 monitoring. The operating SO_2 monitor is located at the multi-pollutant NCore site in the Fairbanks North Star Borough operated for compliance with NCore site requirements.				

Table 1.					
CBSA Description[1]	CBSA population[1, 2]	total amount of SO2 in tons per year emitted within the CBSA (from 2014 NEI[4])	PWEI (population x total emissions ÷ 1,000,000)	Minimum required number of SO_2 monitors in CBSA (see Table 2 below)	Present number of SO_2 monitors in CBSA
Combined Municipality of Anchorage and Matanuska-Susitna Valley Borough (MSA)	380,821	635.5	242.0	0	0
Fairbanks North Star Borough (MSA)	97,581	2390.8	233.3	0	1*
City and Borough of Juneau (µSA)	31,275	712.7	63.4	0	0
North Slope Borough	9,430	1235.0	11.6	0	0

[1]see http://www.census.gov/population/metro/data/def.html & https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures (April 2010).

[4]see https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data

*Satisfies NCore requirement

Table 2. Minimum SO_2 Monitoring Requirements (Section 4.4.2 of App D to Part 58)	
PWEI (Population weighted Emission Index) Value	Require number of SO_2 monitors
>= 1,000,000	3
>= 100,000 but < 1,000,000	2
>= 5,000 but < 100,000	1

Table A-6 NO2 Network Evaluation form

PART 58 APPENDIX D NETWORK EVALUATION FORM FOR NITROGEN DIOXIDE (NO_2)				
STATE: ALASKA **AGENCY:** DEPARTMENT OF ENVIRONMENTAL CONSERVATION **AQS AGENCY CODE:** 02 **EVALUATION DATE:** 4-18-2018 **EVALUATOR:** ANNA BREUNINGER				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.3.2(a)	Near-road NO2 Monitors: One microscale near-road NO_2 monitoring station in each CBSA with a population of 500,000 or more persons.			✓
4.3.2(a)	Near-road NO2 Monitors: An additional near-road NO_2monitoring station is required for any CBSA with a population of 2,500,000 persons, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT count.			✓
4.3.2(b)	Near-road NO2 Monitors: Measurements at required near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO_2, and NO_X			✓
4.3.3(a)	Area-wide NO2 Monitoring: One monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales.			✓
Comments: The State of Alaska has no CBSA with a population of 500,000				

Table 1					
CBSA Description[1]	CBSA population[2,3] (2010)	Required number of Near-road NO_2 sites	Present number of Near-road NO_2 sites	Required number of Area-wide NO_2 sites	Present number of Area-wide NO_2 sites
Combines Municipality of Anchorage and Matanuska-Susitna Valley Borough (MSA)	380,821	0	0	0	0
Fairbanks North Star Borough (MSA)	97,581	0	0	0	1*
City and Borough of Juneau (µSA)	31,275	0	0	0	0

[1]see https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures (April 2010).

*NCore site requirement

Appendix B Summary of Monitoring Path & Siting Criteria Evaluation Forms

Table B-1 Summary of Appendix E forms: $PM_{2.5}$, PM_{10} & $PM_{10-2.5}$

S	Garden	Parkgate	Laurel*	Butte	Palmer	State Office Building	North Pole Fire Station	NCore	Floyd Dryden
Parameter(s)	$PM_{2.5}$ & PM_{10}	$PM_{2.5}$ & PM_{10}	PM_{10}	$PM_{2.5}$ & PM_{10}	$PM_{2.5}$ & PM_{10}	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$, PM_{10} & $PM_{10-2.5}$	$PM_{2.5}$ & PM_{10}
Address	1600 E 16th Ave Anchorage	11723 Old Glenn Hwy, Eagle River	4335 Laurel St Anchorage	Harrison Ct Butte	S. Gulkana Palmer	675 7th Avenue Fairbanks	3288 Hurst Rd North Pole	809 Pioneer Rd. Fairbanks	Floyd Dryden Middle School, Juneau
AQS ID	02-020-0018	02-020-1004	02-020-0045	02-170-0008	02-170-0012	02-090-0010	02-090-0035	02-090-0034	02-0110-0004
2. HORIZONTAL AND VERTICAL PLACEMENT	Criteria met, 8 m	Criteria met, 7 m	Criteria met, 7 m	Criteria met, 4 m	Criteria met, 4 m	Criteria met, 6 m	Criteria met, 4 m	Criteria met, 4 m	Criteria met, 7 m
3. SPACING FROM MINOR SOURCES (a)	Criteria met, neighborhood	Criteria met	Criteria met, maximum impact site, graveled streets in winter	Criteria met, gravel cul-de-sac	Criteria met	Criteria met, > 40 m to nearest solid fuel burning appliance	Criteria met	Criteria met, ~ 160m to Diving Duck Roasters,~450m to power plant	Furnace flue @ 20m, 4m penthouse @ 15m
4. SPACING FROM OBSTRUCTIONS (a)	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted
4. SPACING FROM OBSTRUCTIONS (b)	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted	Criteria met, unrestricted
5. SPACING FROM TREES (a)	Criteria met, >10 m	Criteria met, >10 m	Criteria met, no trees within 200 m	Criteria met, >10 m	Criteria met, nearest tree > 25 m	Criteria met, >10 m	Criteria met, >10 m	Criteria met, none	Criteria met, 12 m tall 25 m away
5. SPACING FROM TREES (c)*			Criteria met						
6. SPACING FROM ROADWAYS	Criteria met, ~14 m to road	Criteria met, 23 & 44 m to roads	Criteria met[‡], 15 m to road, maximum exposure site	Criteria met, road > 150m	Criteria met, road > 20 m	Criteria met, 20 m to road	Criteria met, 23 m to road	Criteria met, ~ 70 m to road	Criteria met, 65 m to road
Changes that might compromise siting?	No	No	No	No	No	No	No	No	No

*Laurel is the only microscale site in Alaska's PM network

Table B-2 Summary of Appendix E forms: CO

	Garden	NCore
Parameter(s)	CO	CO
Address	1600 E. 16th St. Anchorage	809 Pioneer Rd Fairbanks
AQS ID	02-020-0018	02-090-0024
2. HORIZONTAL AND VERTICAL PLACEMENT	Criteria met, ~3 m	Criteria met, 4 m
3. SPACING FROM MINOR SOURCES	Criteria met, residential	Criteria met, ~ 160m to Diving Duck Roasters,~450m to power plant
4. SPACING FROM OBSTRUCTIONS (a)	Criteria met, no obstacles	Criteria met, no obstacles
4. SPACING FROM OBSTRUCTIONS (b)	Criteria met, 180º	Criteria met, unrestricted
5. SPACING FROM TREES (a)	Criteria met, >10 m	Criteria met, none
5. SPACING FROM TREES (c)	Criteria not met, 2.5 m from spruce dripline	Criteria met, no trees <50 m
6. SPACING FROM ROADWAYS	7 meters from roadway	Criteria met, 85 m from roadway
9. PROBE MATERIAL & RESIDENCE TIME (a)	Criteria met	Glass w/ FEP sample lines
9. PROBE MATERIAL & RESIDENCE TIME (c)	Criteria not met, 22 seconds	Criteria met, < 5 seconds
Changes that might compromise siting?	No	No

Table B-3 Summary of Appendix E forms: O3, SO2, NO, NOx, NO_2 and NOy

	Palmer	NCore		
Parameter(s)	O_3	O_3	SO_2	NO, NOx, NO_2 & NO_y
AQS ID	02-170-0012	02-090-0034		
Address	S. Gulkana St.	809 Pioneer Rd. Fairbanks		
2. HORIZONTAL AND VERTICAL PLACEMENT	Criteria met, ~4 m	Criteria met, ~4 m	Criteria met, ~4 m	Criteria met, ~4 m
3. SPACING FROM MINOR SOURCES	Criteria met, no sources	Criteria met, ~ 160m to Diving Duck Roasters,~450m to power plant	Criteria met, ~ 160m to Diving Duck Roasters,~450m to power plant	Criteria met, ~ 160m to Diving Duck Roasters,~450m to power plant
3. SPACING FROM MINOR SOURCES (b)	Criteria met, no furnaces/flues	Criteria met, no furnaces/flues		
4. SPACING FROM OBSTRUCTIONS (a)	Criteria met, no obstacles	Criteria met, no obstacles	Criteria met, no obstacles	Criteria met, no obstacles
4. SPACING FROM OBSTRUCTIONS (b)	Criteria met, no obstacles, 360º airflow	Criteria met, unrestricted 360o airflow	Criteria met, unrestricted 360o airflow	Criteria met, unrestricted 360o airflow
4. SPACING FROM OBSTRUCTIONS (d)				No near-road
5. SPACING FROM TREES (a)	Criteria met, nearest tree > 25m	Criteria met, none	Criteria met, none	Criteria met, none
5. SPACING FROM TREES (b)			NA	NA
5. SPACING FROM TREES (c)	NA	NA	NA	NA
6. SPACING FROM ROADWAYS	Criteria met, road > 20m	Criteria met, road ~70m		NA
9. PROBE MATERIAL & RESIDENCE TIME (a)	FEP Teflon sample lines	Glass w/ FEP sample lines	Glass w/ FEP sample lines	Glass w/ FEP sample lines
9. PROBE MATERIAL & RESIDENCE TIME (c)	< 20 seconds	< 5 seconds	< 11 seconds	< 20 seconds
Changes that might compromise siting?	No	No	No	No

Table B-4 Blank Part 58 Appendix E form for PM

PART 58 APPENDIX E SITE EVALUATION FORM FOR PM2.5, PM10, PM10-2.5,and Pb					
SITE NAME:	SITE ADDRESS:				
AQS ID:	EVALUATION DATE:	EVALUATOR:			
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICAL PLACEMENT	2-15 meters above ground level for neighborhood or larger spatial scale, 2-7 meters for microscale spatial scale sites and middle spatial scale $PM_{10-2.5}$ sties. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.	.			
3. SPACING FROM MINOR SOURCES	(a) For neighborhood or larger spatial scales avoid placing the monitor near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site. Particulate matter sites should not be located in an unpaved area unless there is vegetative ground cover year round.				
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.				
	(b) The inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential. For particle sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.				
5. SPACING FROM TREES	(a) To reduce possible interference the inlet must be at least 10 meters or further from the drip line of trees.				
	(c) No trees should be between source and probe inlet for microscale sites.				
6. SPACING FROM ROADWAYS	Spacing from roadways is dependent on the spatial scale and ADT count. See section 6.3(b) and figure E-1 for specific requirements.				
Are there any changes that might compromise original siting criteria?					
Other Comments:					

Table B-5 Blank Part 58 Appendix E form for CO

PART 58 APPENDIX E SITE EVALUATION FORM FOR CO					
SITE NAME:	SITE ADDRESS:				
AQS ID:	EVALUATION DATE:		EVALUATOR:		
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICAL PLACEMENT	For neighborhood or larger spatial scale sites the probe must be located 2-15 meters above ground level and must be at least 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.				
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.				
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet (exception is street canyon or source-oriented sites where buildings and other structures are unavoidable).				
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.				
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.				
	(c) No trees should be between source and probe inlet for microscale sites.				
6. SPACING FROM ROADWAYS	2. (b) Microscale CO monitor probes in downtown areas or urban street canyon locations shall be located a minimum distance of 2 meters and a maximum distance of 10 meters from the edge of the nearest traffic lane.				
	2. (c) Microscale CO monitor inlet probes in downtown areas or urban street canyon locations shall be located at least 10 meters from an intersection and preferably at a midblock location.				
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex) for reactive gases.				
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.				
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.					
Other Comments:					

[1] Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

Table B-6 Blank Part 58 Appendix E form for O3

PART 58 APPENDIX E SITE EVALUATION FORM FOR O3					
SITE NAME: SITE ADDRESS: AQS ID EVALUATION DATE EVALUATOR					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICAL PLACEMENT	2-15 meters above ground level. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.				
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.				
	(b) To minimize scavenging effects, the probe inlet must be away from furnace or incineration flues or other minor sources of SO_2 or NO.				
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.				
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.				
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.				
	(c) No trees should be between source and probe inlet for microscale sites.				
6. SPACING FROM ROADWAYS	See spacing requirements table below				
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).				
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.				
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.					
Other Comments:					

[1]Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

[2]Applicable for ozone monitors whose placement has not already been approved as of December 18, 2006.

Table B-7 Blank Part 58 Appendix E form for SO_2

PART 58 APPENDIX E SITE EVALUATION FORM FOR SO2					
SITE NAME_ _____ SITE ADDRESS____ _____ AQS ID_____ EVALUATION DATE_____ EVALUATOR ___ _____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICAL PLACEMENT	2-15 meters above ground level. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.				
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.				
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.				
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.				
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.				
	(c) No trees should be between source and probe inlet for microscale sites.				
6. SPACING FROM ROADWAYS	There are no roadway spacing requirements for SO2.				
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).				
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.				
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.					
Other Comments:					

Table B-8 Blank Part 58 Appendix E form for NO, NOx, NO_2 and NOy

PART 58 APPENDIX E SITE EVALUATION FORM FOR NO, NOx, NO2, and NOy					
SITE NAME_____ SITE ADDRESS _____					
AQS ID_____ EVALUATION DATE_____ EVALUATOR _____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICAL PLACEMENT	For neighborhood or larger spatial scale sites the probe must be located 2-15 meters above ground level and must be at least 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. Microscale near-road NO_2 monitoring sites are required to have sampler inlets between 2 and 7 meters above ground level. If located near the side of a building or wall, then locate the sampler probe on the windward side relative to the prevailing wind direction during the season of highest concentration potential.				
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale and larger avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.				
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.				
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.				
	(d) For near-road NO_2 monitoring stations, the monitor probe shall have an unobstructed air flow, where no obstacles exist at or above the height of the monitor probe, between the monitor probe and the outside nearest edge of the traffic lanes of the target road segment.				
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.				
	(c) No trees should be between source and probe inlet for microscale sites.				
6. SPACING FROM ROADWAYS	See spacing requirements table below				
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).				
	(c) Sampling probes for reactive gas monitors at NCore and at NO_2 sites must have a sample residence time less than 20 seconds.				
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.					
Other Comments:					

Table B-9 Roadway ADT for CO, O_3, SO_2 and NO suite Part 58 Appendix E forms

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)
≤10,000	10
15,000	25
20,000	45
30,000	80
40,000	115
50,000	135
≥60,000	150

Appendix C Additional Monitoring Projects

Smoke Monitoring for Air Quality Advisories

Smoke from wildland fires can affect large areas and impacts air quality in regions both close to and far away from the burning fire. Almost every summer, large areas of the State are impacted by smoke from wild fires, with air quality degrading into the very unhealthy to hazardous range. DEC assists the Alaska Fire Service in assessing air quality impacts in areas affected by fires and provides information needed to protect public health. The DEC Air Quality Division uses two separate methods to assess air quality impacts and issue air quality advisories statewide: monitoring data and visibility information. Often a combination of both datasets is used to issue air quality advisories. The DEC meteorologist or air quality staff with assistance from the NWS use meteorological and air monitoring data to forecast smoke movement and predict where air quality impacts might be experienced.

DEC, with the help of local site operators, currently operates two continuous analyzers in rural Alaska during the wild fire season: Galena and Ft Yukon. DEC also has two portable, battery-operated, continuous particulate matter monitors (Met One E-BAM) equipped with satellite communication devices, which can transmit the data to a website. The E-BAM instrument requires little maintenance and staff is typically only needed at set-up and to ensure proper operation for the first day. Remote data access allows staff in the DEC office or in the field to use the data for advisories and briefings. Currently no additional samplers are requested, as staff time and travel funds are the limiting factor in expanding the smoke monitoring network.

Volcanic Ash Monitoring

The Alaska Volcano Observatory and DEC will cooperate on volcanic ash monitoring should a volcano begin erupting. DEC uses a PM_{10} Met One E-BAM with an AIRSIS communication system that allows the DEC meteorologist to review data near real time and issue air quality advisories for the area during volcanic eruptions.

Radiation Monitoring

The State has three radiation monitoring network sites (RadNet) located in Anchorage, Fairbanks and Juneau. Various agencies and groups operate the equipment. The site in Anchorage is operated by the Alaska Department of Health and Social Services. The DEC Air Quality Division operates the sites in Fairbanks and Juneau.

Appendix D Improve Network

The Alaska Regional Haze SIP includes a monitoring plan for measuring, estimating and characterizing air quality and visibility impairment at Alaska's four Class I areas. The haze species concentrations are measured as part of the IMPROVE monitoring network deployed throughout the United States. Alaska uses four IMPROVE monitoring stations representing three of the four Class I Areas. Three of these stations (Denali National Park and Preserve, Simeonof, and Tuxedni) were deployed specifically in response to Regional Haze rule requirements. There is no air monitoring being conducted at the Bering Sea Wilderness Area due to its remote location.

Monitoring site information and additional Regional Haze information are available at DEC's Regional Haze website, http://dec.alaska.gov/air/anpms/regional-haze. Monitoring data and additional information for the Alaskan IMPROVE sites are available from the EPA website, http://vista.cira.colostate.edu/improve.

Appendix E NAAQS Summary Tables

Table E-1 $PM_{2.5}$ DV under local /actual conditions (µg/m^3); exceedance exceptional event values not included

$PM_{2.5}$ Monitoring Sites	AQS Site ID	98th Percentile			Weighted Annual Mean			2017 Design Value	
		2017	2016	2015	2017	2016	2015	24-hr	Annual
Garden/ Anchorage	02-020-0018	26.9	16.1	18.4	5.5	6.5	6.3	20	6.1
Parkgate / Eagle River	02-020-1004	15.4	13.8	17.2	4.2	4.1	6.1	15	5.1
Butte/ Matanuska-Susitna Valley	02-170-0008	29.7	29.7	37.9	5.7	5.8	6.8	32	6.1
Palmer/ Matanuska-Susitna Valley	02-170-0012	11.1	9.2	9.9	3.2	2.8	2.7	10	2.9
Wasilla/ Matanuska-Susitna Valley	02-170-0013	--	--	20.7	--	--	6.1*	NA	NA
State Office Building/ Fairbanks	02-090-0010	37.5*	41.5	35.3	8.9*	9.7	10.3	38	9.6
NCore Site/ Fairbanks	02-090-0034	34.9	32.4	36.7	8.5	9.5	10.0	35	9.3
North Pole Fire #3/ North Pole	02-090-0035	75.5	66.8	111.6	14.0	13.7	20.0	85	15.9
Floyd Dryden/ Juneau	02-110-0004	22.4	24.0*	21.0	5.7	6.0*	7.7	22	6.1

* Annual values did not meet data completeness criteria.

Table E-2 $PM_{2.5}$ DV under local /actual conditions (µg/m3); Only EPA concurred exceptional exceedance event values are excluded (EPA has not acted on an Exceptional Events Waiver Request submitted for the 2015 Wildfire Season affecting Interior Alaska). There were no wildfires affecting FNSB sites in 2016.

$PM_{2.5}$ Monitoring Sites	AQS Site ID	98th Percentile			Weighted Annual Mean			2017 Design Value	
		2017	2016	2015	2017	2016	2015	24-hr	Annual
State Office Building/ Fairbanks	02-090-0010	38.0	41.5	57.1	9.3*	9.7	11.8	46	10.3
NCore Site/ Fairbanks	02-090-0034	37.2	32.4	60.0	8.9	9.5	12.5	43	10.3
North Pole Fire #3/ North Pole	02-090-0035	75.5	66.8	111.6	14.4	13.7	21.4	85	16.5
Butte, Matanuska-Susitna Valley	02-170-0012	29.7	29.7	37.9	5.7	5.8	6.8	32	6.1

* Annual values did not meet data completeness criteria

Table E-6: DV O_3 (ppm)

O_3 Monitoring Sites	Site ID	2017 Valid Days	2017 Percent Compl	2017 4th Max	2016 Valid Days	2016 Percent Compl	2016 4th Max	2015 Valid Days	2015 Percent Compl	2015 4th Max	3-Years Percent Compl	3-Years Design Value
Palmer/ Matanuska-Susitna Valley	02-170-0012	213	100	0.043	212	99	0.044	197	92	0.047	97	0.044
NCore/ Fairbanks	02-090-0034	277	76	0.048	207	97	0.036	209	98	0.045	90	0.043

Table E-3 DV SO_2 (ppb)

SO_2 Monitoring Sites	Site ID	2017 99th Percentile	2017 Completed Quarters	2016 99th Percentile	2016 Completed Quarters	2015 99th Percentile	2015 Completed Quarters	3-yrs Design Value
NCore/Fairbanks	02-090-0034	35	4	35	4	30	4	35

Table E-4 DV NO_2 (ppb)

NO_2 Monitoring Sites	Site ID	2017 98th Percentile	2017 Completed Quarters	2016 98th Percentile	2016 Completed Quarters	2015 98th Percentile	2015 Completed Quarters	3-yrs Design Value
NCore/ Fairbanks	02-090-0034	54.5	4	54.9	3	61.8	4	59