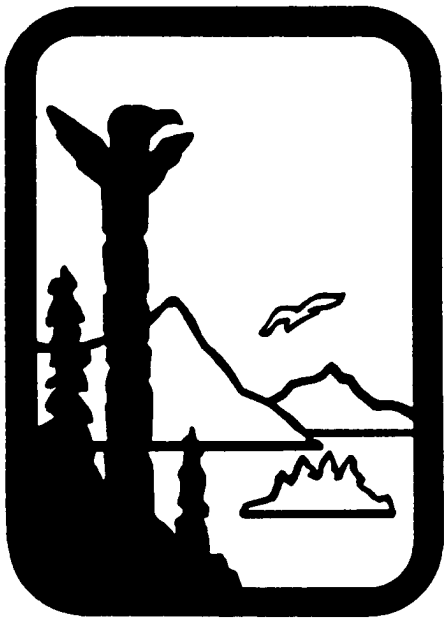
Alaska Department of Environmental Conservation



Amendments to:

State Air Quality Control Plan
Vol. II: Analysis of Problems, Control Actions
Section III.B: Anchorage Transportation Control Program

Adopted

February 22, 2013

Sean Parnell, Governor

Larry Hartig, Commissioner

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Anchorage
CO Limited Maintenance Plan

A plan addressing the second 10 years of the 2004 -2024 CO maintenance planning period

Vol. II: Analysis of Problems, Control Actions
Section III.B: Anchorage Transportation Control Program

Prepared by the
Municipality of Anchorage
Department of Health and Human Services

for submission to the
Alaska Department of Environmental Conservation
for inclusion in the
State Implementation Plan for Air Quality

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A note for reviewers of this document.

This document is organized and formatted to be consistent with the State of Alaska Air Quality Control Plan or SIP. It constitutes a proposed amendment to the Anchorage CO Maintenance Plan which was approved by the Anchorage Assembly in May 2011. That Plan comprised eleven sections (Sections III.B.1 – B.11) of the SIP.

This proposed amendment adds a new Section III.B.12, entitled *Limited Maintenance Plan for 2014-2024* and revises Section III.B.10, which addresses air quality conformity procedures for CO. Minor changes were also made to Section III.B.4 that provide flexibility in number and location of CO monitoring sites that must be operated in Anchorage. Other sections of the Plan remain unchanged and are not shown in this document.

On December 20, 2012, after completion of a public comment period and review by the AMATS Air Quality and Technical Advisory Committees, the AMATS Policy Committee recommended that the Anchorage Assembly adopt this amendment to the CO Maintenance Plan.

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Introductory Note: In this document each reference to “CAAA” means the Clean Air Act Amendments of 1990, P.L. 101-549.

Minor revisions to this section clarify that CO monitoring will be conducted in conformance with federal regulation and provide flexibility to make changes in the CO monitoring network, subject to approval by the EPA Administrator.

III.B.4. Carbon Monoxide Monitoring Program

Although emission projections are used to track reasonable further progress (RFP), it is actual ambient air quality monitoring data that determine whether or not an area meets the NAAQS. The difficulty with using ambient monitoring data to assess trends is the fluctuation in pollution concentrations caused by daily, weekly, and yearly variations in meteorological conditions, traffic levels, and other factors. However, it is important to monitor and compare ambient air quality concentrations to modeled emission projections to determine if the projections are reasonable and credible. Section 110(a)(2)(B) of the CAAA (42 U.S.C. 7410(a) (2) (b)) requires that each implementation plan submitted to EPA provide for the establishment and operation of "appropriate devices, methods, systems, and procedures necessary to monitor, compile, and analyze data on ambient air quality."

The Anchorage CO monitoring network is currently comprised of four sampling stations. The MOA uses TECO48 CO analyzers at each station (Figure III.B.4-1). These instruments meet all specifications required by the EPA for ambient CO monitoring and are designated by the EPA as a "reference method" for CO.

Figure III.B.4-1
TECO 48 CO Analyzer with Strip Chart Recorder
and Data Acquisition System

The monitoring network is operated 24 hours a day from October 1 through March 31. Hourly averages of CO levels are provided from each station in the network. These data are uploaded to a central computer every weekday. Data are submitted to EPA on a quarterly basis for inclusion in the nationwide air quality database known as AQS. CO monitoring is conducted in conformance with guidelines established in federal regulations, EPA guidance

and instrument manufacturer recommendations. Third party instrument performance audits are conducted by EPA and/or ADEC quarterly.

The locations and the status (as of October 2012) of the stations in the CO monitoring network are described in Table III.B.4-1. The purpose of this network is to characterize the range of CO exposures experienced by Anchorage residents. By analyzing pollution concentration trends over time, CO monitoring stations can also serve to assess the effectiveness of strategies designed to reduce air pollution emissions and improve air quality. Each monitoring station was selected in accordance with guidelines established by the EPA. As more has been learned about the nature of the CO problem in Anchorage, more emphasis has been placed on monitoring CO levels in neighborhoods.

Table III.B.4-1

Description of Anchorage CO Monitoring Sites

Location	Site Description
Turnagain (active)	Monitoring began at this neighborhood-scale site in October 1998 CO concentrations measured here were the highest of the twenty sites monitored during a saturation monitoring study conducted in the winter of 1997-98. It now exhibits the highest concentrations of the current network. It exceeded the NAAQS once in 1999 and 2001.
Garden (active)	Monitoring began at this residential neighborhood location at 16th and Garden Street in 1979. In the early 2000's, Garden typically recorded higher peak concentrations than the micro-scale sites at Seward Highway and at Benson.
Parkgate (active)	Monitoring began at this middle-scale site in Eagle River (approx 10 miles north of Anchorage) in December 2005. Thus far, concentrations appear to be low relative to other active sites (i.e., Turnagain, Garden) in the network.
8th and L Street (active)	Monitoring began at this middle-scale site in downtown Anchorage in October 2007. Thus far, concentrations appear to be low relative to other active sites in the network.
7th & C Street (discontinued)	This station was located mid-block between 6th and 7th Avenue on C Street. Monitoring began here in 1973 and was discontinued in 1995. The last exceedance at this site was recorded in 1990.
Benson (discontinued)	Monitoring began at this micro-scale site on the southwest corner of Spenard Road and Benson Blvd in 1978. This site frequently recorded exceedances of the NAAQS in the late 1970's, 1980's and early 1990's. The last exceedance was measured here in 1996. Benson was decommissioned in December 2001 when it became evident that the Seward Highway site exhibited higher concentrations.
Sand Lake (discontinued)	Monitoring began at this neighborhood-scale site in 1980 and was discontinued in March 1998. This station was located on Raspberry Road approximately 0.3 miles east of Jewel Lake Road in west Anchorage. The last exceedance was recorded here in 1989.
Seward Highway (discontinued)	Monitoring began at this micro-scale site, located on the southwest corner of the intersection of Benson Blvd. and Seward Highway, in October of 1987. In the late 80's and early 90's this site frequently measured exceedances of the NAAQS. However, no exceedances were measured after calendar year 1996. This station was decommissioned in December 2004 when it became clear that future exceedances at this site were unlikely and the highest CO concentrations were occurring in residential areas.
Jewel Lake (discontinued)	Monitoring began here at this neighborhood-scale site in west Anchorage in October 2002 and was discontinued in March 2004 because CO concentrations were lower than the other three sites in the network.
Bowman (discontinued)	Monitoring at this neighborhood-scale site in south Anchorage was conducted between January 2006 and March 2007. Monitoring was terminated when it became apparent that CO concentrations were very low at this site.

The locations of the monitoring sites are shown on the maintenance area boundary map (Figure III.B.2-1) in Section III.B.2.

Continued Monitoring

The Clean Air Act Section 110(a)(2)(B) (42 U.S.C. 7410(a)(2)(B)) requires implementation plans to provide for the "establishment and operation of appropriate devices, methods, systems, and procedures necessary to monitor, compile, and analyze data on ambient air quality…." The MOA is committed to the continued CO monitoring as required by Title III, Section 319 of the Clean Air Act and the EPA Administrator and will operate monitoring sites in compliance with EPA monitoring guidelines set out in 40 CFR Part 58 "Ambient Air Quality Surveillance" and Appendices A through G of Part 58. Three saturation monitoring studies have been conducted by the MOA to assess the adequacy of the monitoring network. The 1997-98 saturation study resulted in the establishment of the Turnagain Station in west Anchorage. Any changes to the monitoring network are discussed in advance with the ADEC and EPA Region 10. The EPA Administrator has final authority on the placement of monitoring sites.

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As part of this LMP, Section III.B.10 below is re-titled and will replace the previously adopted section entitled "Motor Vehicle Emissions Budget."

III.B.10 Air Quality Conformity Procedures

Note: This section of the maintenance plan was revised in June 2012 as part of the preparation of a limited maintenance plan for CO. At the same time Section III.B.10 was revised, a new section (Section III.B.12) was added. Together Section III.B.10 and Section III.B.12 constitute the Anchorage CO Limited Maintenance Plan.

Regional Conformity Determination Methodology

Before any regional transportation plan can be adopted or amended, the metropolitan planning organization is required to make an affirmative determination that it meets conformity requirements outlined in 40 CFR 93. Although EPA policy does not exempt CO LMP areas from the need to demonstrate conformity, it allows the area to do so without completing a regional emissions analysis. EPA guidance states that "emissions budgets in limited maintenance plan areas may be treated as essentially not constraining." * The EPA has concluded that for transportation purposes, the emissions in a qualifying LMP area need not be capped for the maintenance period and thus no emissions budget is required in the maintenance plan. A regional emissions analysis and associated regional conformity requirements (40 CFR 93.118 and 93.119) are no longer applicable. Similarly, federal actions subject to the general conformity rule would automatically satisfy the "budget test" specified in Section 93.158(a)(5)(i)(A) for the same reasons.

When a regional conformity determination is made for a transportation plan or improvement program it should state that a regional emission analysis is not required because the area has an approved LMP for CO. The Plan and the TIP must still be made available for public review. The interagency consultation requirements specified in 40 CFR 93.112 and under state regulation, 18 AAC 50 .715 and 50.720 still apply. To meet requirements outlined in 40 CFR 93.113, the conformity determination must also address whether the transportation control measures in the SIP are being implemented in a timely manner.

Project-Level Conformity Methodology

CO LMP areas are not exempt from project-level or "hot spot" analysis requirements outlined in 40 CFR93.116 & 123. A project-level hot-spot analysis consists of performing dispersion modeling to determine whether a project will cause or contribute to any new violations of ambient standards or increase the frequency or severity of existing violations. This hot-spot modeling requirement applies to certain types of projects in all non-attainment and maintenance areas. Thus, in Anchorage, hot-spot CO modeling must be performed in project-level conformity determinations for these types of projects (spelled out in 40 CFR 93.123(a)).

* Memorandum "Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas," Joseph W. Paisie, EPA, Oct 6, 1995

The EPA has released guidance on how the MOVES model should be used to prepare project level conformity analyses.[16†] Inputs to the hot-spot modeling include link-specific vehicle emission factors for roadway segments in the project vicinity. For project-level analyses, these emission factors will be developed in one of two ways, depending on the type of project. Through the interagency consultation process, a project will be put into one of two tracks as follows:

1. Projects that do **not** significantly impact off-network emissions (e.g., projects that are not likely to affect the amount of initial idling and/or engine block heater use in the project area) will follow a more routine approach to computing emission impacts using MOVES. Off-network emissions will not be directly modeled in the analyses of these projects, as they do not change as a result of the project. For these types of projects, off-network emissions are accounted for in the background concentration input in CAL3QHC. The interagency consultation team should determine the appropriate CO background concentration used to model the project.‡

2. Those projects that do significantly impact off-network emissions (e.g., construction of facilities like parking lots that add substantially to start emissions in the project area, or projects that are likely to affect the amount of initial idling and/or engine block heater use in the area) will follow a process that incorporates off-network emissions, roadway link emissions and background concentration. The EPA MOVES guidance for project level analyses describes how off network emissions should be modeled. The interagency consultation team should review and approve the assumptions that are used in this modeling. The consultation team should also evaluate and determine the appropriate dispersion model used to model the ambient CO impacts expected from these off network emissions.

The interagency consultation process will be the key means of ensuring that projects are placed in the correct track for calculation of emission impacts. The interagency consultation process will also be important in ensuring that appropriate analyses of project emission impacts are conducted under the two scenarios listed above. Moreover, it is important that the interagency process be used to develop guidance so that consistent methodologies are utilized in project-level analyses. Hot spot modeling is often required in project-level conformity determinations. When possible, the interagency consultation process should be used to develop written guidance regarding modeling inputs and assumptions and these assumptions should be consistent with those employed in the maintenance demonstration in

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† This endnote was already included in the references section of the original Anchorage CO SIP adopted by the State of Alaska in September 2011. This footnote references an EPA document entitled: "Using MOVES in Project Level Carbon Monoxide Analyses", EPA-420-B-10-041, December 2010.

‡ Typically, background CO is estimated from background or neighborhood-scale monitors in the vicinity. However, in Anchorage, CO concentrations monitored in some residential areas are substantially *higher* than those near major roadways. For example, a CO monitoring study conducted in 1997-98 showed that CO concentrations measured at the Turnagain and Garden sites, which are located on relatively low volume residential streets, were 20% to 50% higher than concentrations measured near major roadway intersections such as the Seward Highway & Benson Boulevard, Old Seward Highway & Dimond Boulelvard, or Lake Otis Boulevard & Tudor Road. CO concentrations along these major arterials were lower even though their traffic volumes were an order of magnitude higher than the neighborhood sites. Evidence suggests that mechanical turbulence from traffic effectively increases the mixing volume at intersection sites and reduces overall CO concentrations. Mechanical turbulence would have a similar effect in reducing the background CO concentration in the vicinity of projects with appreciable traffic. This should be considered by the interagency consultation team when determining an appropriate background concentration.

this Plan. As always, conformity determinations will be subject to the applicable public review requirements. This provides the public an opportunity to comment on the approach that is taken for the conformity determination for each plan, program, and project.

General Conformity

For projects requiring general conformity determinations, it is also important to consider the impacts of off-network motor vehicle emissions (e.g., idle emissions). Interagency consultation shall be used to determine whether off-network mobile source emissions are significant and what analysis of these emissions is appropriate for determining general conformity. An example of a project of this type is an airport expansion.

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SECTION III.B ANCHORAGE CARBON MONOXIDE CONTROL PROGRAM

III.B.12. Limited Maintenance Plan for 2014-2024

Note: This is a new section added to the CO Maintenance Plan. Section III.B.10, which addresses CO conformity, was revised and submitted at the same time to reflect the simplified conformity process required for limited maintenance areas. Minor revisions were also made to Section III.B.4 that provide additional flexibility in the operation of the Anchorage CO monitoring network.

Background

When the EPA first approved the Anchorage CO Maintenance Plan, effective July 23, 2004, it initiated a 20-year maintenance planning period as defined in the CAA. The CAA requires the submission of a second maintenance plan eight years after the redesignation that covers the second ten years of the maintenance planning period. Thus, an updated "second 10-year maintenance plan" for Anchorage is required for the period July 23, 2014 through July 22, 2024.

The EPA provides areas with design values less than 7.65 ppm the option of preparing their second 10-year maintenance plan using the limited maintenance plan (LMP) procedure. The basic elements of the LMP procedure for CO are described in a guidance memorandum, referred to as the Paise memo.[§] Anchorage has decided to use the LMP option for this second 10-year maintenance plan update.

The Paise memo identifies five core provisions that should be included in the LMP. These are: (1) an attainment inventory; (2) a maintenance demonstration, (3) monitoring to verify continued attainment of the CO NAAQS; (4) a contingency plan; and (5) conformity determination requirements under an LMP. These are discussed in more detail below.

Discussion of Core LMP Provisions

1. Attainment Inventory

The Paise memo states that "the State should develop an attainment emissions inventory to identify the level of emission in the area which is sufficient to attain the NAAQS." A comprehensive inventory was prepared for base year 2007 that showed that motor vehicle emissions were responsible for approximately 79% of all CO emissions in the Anchorage bowl inventory area. The emission inventory was prepared for a "CO design day" when CO concentrations are the highest. In Anchorage, the highest CO concentrations tend to occur on mid-winter weekdays when temperatures are near zero. The assumptions and computations involved in producing this inventory are described in detail in Section III.B.3 and its appendix.

Results of 2007 emission inventory are re-summarized in Table III.B.12-1.

Table III.B.12-1
Sources of Anchorage CO Emissions in 2007 Base Year

§ Memorandum "Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas," Joseph W. Paisie, EPA, Oct 6, 1995

Source Category	CO Emitted (tons per day)	% of total
Motor vehicle – running emissions	40.5	25.4%
Motor vehicle – start emissions	84.8	53.4%
Motor vehicle – extended idling by combination long-haul trucks	0.3	0.1%
Subtotal – Motor Vehicles	125.6	78.9%
Ted Stevens Anchorage International Airport Operations	12.4	7.8%
Merrill Field Airport Operations	0.7	0.4%
Wood burning – fireplaces and wood stoves	6.2	3.9%
Space heating – natural gas	3.8	2.4%
Miscellaneous (railroad, marine, snowmobiles, snow removal, portable electrical generators, welding, etc.)	9.3	5.8%
Point sources (power generation, sewage sludge incineration)	1.3	0.8%
Subtotal – Other Sources	**33.7**	**21.1%**
TOTAL – ALL SOURCES	**159.3**	**100%**

2. Maintenance Demonstration

According to the Paise memo, the maintenance demonstration requirement is considered to be satisfied "if the monitoring data show that the area is meeting the air quality criteria for limited maintenance areas." Areas with design values of 7.65 ppm (85% of the CO NAAQS) or less qualify for the LMP option.**

Unlike previous CO attainment and maintenance plans prepared for Anchorage, when an LMP is prepared there is no requirement to forecast CO emissions or concentrations to demonstrate compliance with the NAAQS. When EPA approves an LMP, it concludes that it is unreasonable to expect that emission growth during the maintenance period would result in a violation of the NAAQS.

Table III.B.12.2 shows that design value as defined in the Paise memo (DV_{Paise}) has consistently met the 7.65 ppm criteria since 2006. The DV_{Paise} in base year 2007 was 6.1

** It should be noted that the Paise memo definition of design value is different than the design value defined earlier in Section III.B.6. In Section III.B.6 the design value is the upper-bound 90th percentile prediction interval value for 2007 computed from second 8-hour maximum values measured at the Turnagain CO monitor between 1999 and 2008. The design value as defined in the Paise memo, is determined by examining the second maximum 8-hour concentration recorded each year at each monitoring site in the area over a two-year period. For each site, the higher of the two values is the design value for that site for that two-year period. To determine the design value for an area for that two-year period, all monitors in the area are reviewed and the highest design value among the individual sites is the design value for the area as a whole. Because the Paise definition of the design value is different than the design value referred to in Section III.B.6, it is referred to as DV_{Paise} in this section.

ppm. In 2011, the value was 6.0 ppm. The Turnagain monitor has consistently measured the highest CO concentrations in the network and thus been the controlling site in the determination of the design value.

III.B.12.2

Computed Design Values (DV_{Paise}) in Anchorage 2002 - 2011

	Highest 2nd Max 8-hr Concentration Measured in Preceding Two-Years				
	Garden	Seward Hwy	Turnagain	DHHS	**DV_{Paise}**
2002	5.7	5.2	7.7		7.7
2003	5.7	5.4	6.7		6.7
2004	6.4	5.5	7.9		7.9
2005	6.4		7.9		7.9
2006	4.8		6.1		6.1
2007	4.3		6.1		6.1
2008	3.8		5.5	3.1	5.5
2009	4.4		5.8	3.6	5.8
2010	4.4		6.1	3.6	6.1
2011	3.8		6.1	2.8	6.1

The Paise memo also notes, that as part of the maintenance demonstration, any control measures in the SIP must be continued. Current CO control measures for Anchorage are described in Section III.B.5. These primary control measures include: (1) an air quality public awareness program aimed at promoting use of engine block heaters to reduce CO cold start emissions and the promotion of bicycling walking, transit and other alternatives to the single occupancy vehicle; (2) a transit marketing program; and (3) carpooling and vanpooling.

3. Monitoring Network/Verification of Continued Attainment

The Paise memo states that the LMP should provide for continued operation of a CO monitoring network consistent with requirements outlined in 40 CFR 58. Anchorage is committed to maintaining a CO monitoring network to verify continued attainment of the NAAQS. Additionally, because the Turnagain monitor consistently measures the highest CO concentrations in the network, the Municipality of Anchorage supports ongoing continuation of a monitoring site in the Turnagain neighborhood.†† The specifics of the CO monitoring network are discussed in Section III.B.4. Commitments to continue monitoring as described in that section remain in force with this LMP.

4. Contingency Plan

The Paise memo notes that Section 175A of the CAA requires that a maintenance plan include contingency provisions. Section III.B.7 of this Plan provides a menu of six possible contingency measures that could be implemented if Anchorage failed to attain the CO

†† The MOA recognizes the importance of assessing CO concentrations in high impact neighborhoods and intends to continue monitoring at the Turnagain site. However, the MOA cannot provide an on-going commitment to monitoring at any particular site because of the possibility of unforeseen logistical and/or budgetary constraints.

NAAQS. These include: (1) increasing public awareness and education, transit, carpool and vanpool promotion efforts; (2) curtailing or limiting the use of fireplaces and woodstoves and other wood burning appliances when high CO is predicted; (3) promoting an increase in transit ridership among commuters by offering reduced fares or free transit for employees of companies that contribute to the subsidy; (4) reinstating the engine block heater installation subsidy; (5) reinstating the ethanol-blended gasoline requirement; and (6) reinstating the I/M program.

The contingency provisions discussed in Section III.B.7 remain unchanged. This LMP does not alter the commitments or the timelines for implementing contingency measures described in that section.

5. Conformity Determinations under LMPs

When the LMP is approved or found adequate by the EPA, a regional emissions analysis will no longer required as part of the regional transportation conformity determination process that must accompany the adoption of all metropolitan transportation plans and improvement programs adopted by AMATS. The conformity requirements and procedures that will be employed by AMATS after this LMP has been approved or found adequate by the EPA are discussed in Section III.B.10. This section was revised as part of the preparation of the LMP. Prior to revision, this section set forth a CO emission budget for use in the conformity determination process. As noted earlier, a regional emissions analysis is not required in limited maintenance areas, so a CO emissions budget is no longer needed. Section III.B.10, as revised, describes the simplified conformity process that will be utilized when this LMP is approved or found adequate for conformity purposes by the EPA.

Planning Process used to Develop the Anchorage CO LMP‡‡

The local planning process used to develop air quality plans in Anchorage is described in detail in Section III.B.1. This same process was used to develop this LMP. The first draft of this LMP was prepared in June 2012. A public review draft was released for 30-day public review by the AMATS Technical Advisory Committee on September 13, 2012. The AMATS Air Quality Advisory Committee met on October 2, 2012 to review the public review draft. Although they did not assemble a quorum, they forwarded their informal endorsement of the LMP, as drafted, to the AMATS Technical and Policy Committees. The AMATS Policy Committee recommended that the Anchorage Assembly adopt the LMP on December 20, 2012. The Assembly adopted the LMP and associated amendments to Section III.B.4 and III.B.10 on January 29, 2013.

ADEC held a public hearing on the LMP on February 12, 2013. After review and consideration of the comments received, the LMP was forwarded to the EPA.

‡‡ This section will be completed when the public review and approval process is completed. The narrative in this paragraph will likely be revised.