ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

# STATE AIR QUALITY CONTROL PLAN

## VOLUME II: ANALYSIS OF PROBLEMS, CONTROL ACTIONS

Revised 1983

VOLUME II

REVISIONS

ATTACHMENT

List of Amendments to the State Air Quality Control Plan
June 26, 1987

Revised portions of Volume II, Analysis of Problems Control Actions, include:

1. Table of Contents listing date of the last revision for each section or page of text, each figure and each table. With copies of the plan maintained in loose-leaf form, this reference will be useful to verify that each page is the most recently reviewed version.

2. Anchorage Air Pollution Episode Curtailment Actions, Section III.B.10-1 through III.B.10-6.

3. Fairbanks I/M Program Design, Section III.C.5-7.

4. Fairbanks Emergency Episode Prevention Plan, Section III.C.10-1 through III.C.10-9.

Revisions to Volume III, Appendices, include:

1. Table of Contents

2. Addition of Chapter 52, Emission Inspection and Maintenance

3. Addition of the revised portion of Chapter 50 pertaining to stack heights and dispersion techniques, to Section II.A.

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# BACKGROUND

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

This document is the most recent update of Volume II of the State Air Quality Control Plan (Plan).

The Plan is composed of three volumes:

Volume I, Air Quality Control Plan, April 21, 1972, describes the initial intent of the Plan. The program descriptions contained in Volume I are technically and administratively outdated and are superseded by the contents of Volumes II and III.

Volume II, Analysis of Problems, Control Actions, provides a narrative of the organization of the Air Quality Control Program in Alaska, local agency roles, permitting, area-wide and point source control and ambient monitoring. As the dynamics of air pollution problems change, it is necessary to amend the Plan to respond to existing problems or to prevent the creation of new problems. The Table of Contents lists the date of the last revision for each section or individual page of text, table and figures. The revision date is noted on each page, usually in the lower right corner.

Volume III, Appendices, contains references which support or detail the programs and procedures described in Volume II. As for Volume II, it is necessary to modify, amend or delete the references and documents contained in Volume III. The Table of Contents for Volume III lists the date of the most recent revisions to this Volume. However, all pages do not contain revision dates.

Since Volumes II and III are maintained in loose-leaf form, it is necessary to verify that the pages of the Plan are properly added, replaced or deleted as necessary. Contact the Air Quality Control Program Manager at the department's central office in Juneau to verify the date of the most recently approved revisions to the Plan.

Rev 6/2/88



Revised 6/26/87

# SECTION I

# BACKGROUND

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Section I

BACKGROUND

A. INTRODUCTION

The 1977 Clean Air Act Amendments require the states to develop State Implementation Plans (SIPs) for air quality for those areas in nonattainment of the National Ambient Air Quality Standards (NAAQS). The NAAQS are the levels of air quality established by the U.S. Environmental Protection Agency (EPA) to protect the public health and welfare. States were required to develop SIPs that demonstrated attainment of the NAAQS by December 31, 1982. If, however, states demonstrated that the NAAQS for carbon monoxide (CO) could not be attained by this deadline, they would request EPA for an extension to December 31, 1987. States receiving an extension were further required to develop a 1982 SIP committing to additional control measures necessary to attain the NAAQS for CO by December 31, 1987. In Alaska, an extension to attain the CO NAAQS were granted by EPA.

The Anchorage and Fairbanks nonattainment portions of the Air Quality Control Plan are part of the 1982 SIP Revision. The plans incorporate strategies that will allow Anchorage and Fairbanks to achieve safe carbon monoxide levels when implemented.

The State of Alaska has also revised its Air Quality regulations so that full authority may be delegated to the State of Alaska for carrying out provisions of the Clean Air Act. These delegated provisions include the Prevention of Significant Deterioration program, New Source Review, and six categories of New Source Performance Standards. The regulatory changes include the adoption of federal visibility regulations. For areas of the state which occasionally exhibit high concentrations of severe wood smoke, the regulations would control the smoke density emitted from wood burning stoves. These provisions would apply only for short periods of time in specific locales where an air quality alert for particulate matter has been issued by the department.

B. AIR QUALITY CONTROL REGIONS

Four air quality control regions have been established in Alaska (Fig. I-1). There are no interstate air quality issues since Alaska has no contiguous boundaries with the rest of the U.S. Alaska's border with Canada is sparsely populated and has little development hence there have been no air quality problems, nor are any anticipated.

The Cook Inlet Intrastate Air Quality Control Region, No. 008, consists of the Greater Anchorage Area Borough, the Kenai Peninsula Borough and the Matanuska-Suisitna Borough. It encompasses an area of approximately 44,000 square miles. This region has the largest concentration residential and commercial areas in the state. The population of this region is 217,529. This region contains one of the two nonattainment area designations, the Anchorage nonattainment area for carbon monoxide.

The Northern Intrastate Air Quality Control Region, No. 9, covers 320,000 square miles, and is sparsely populated and developed. Most of the population and commercial activity is located in the Fairbanks area; the Prudhoe Bay area of the North Slope is also an active area for construction related

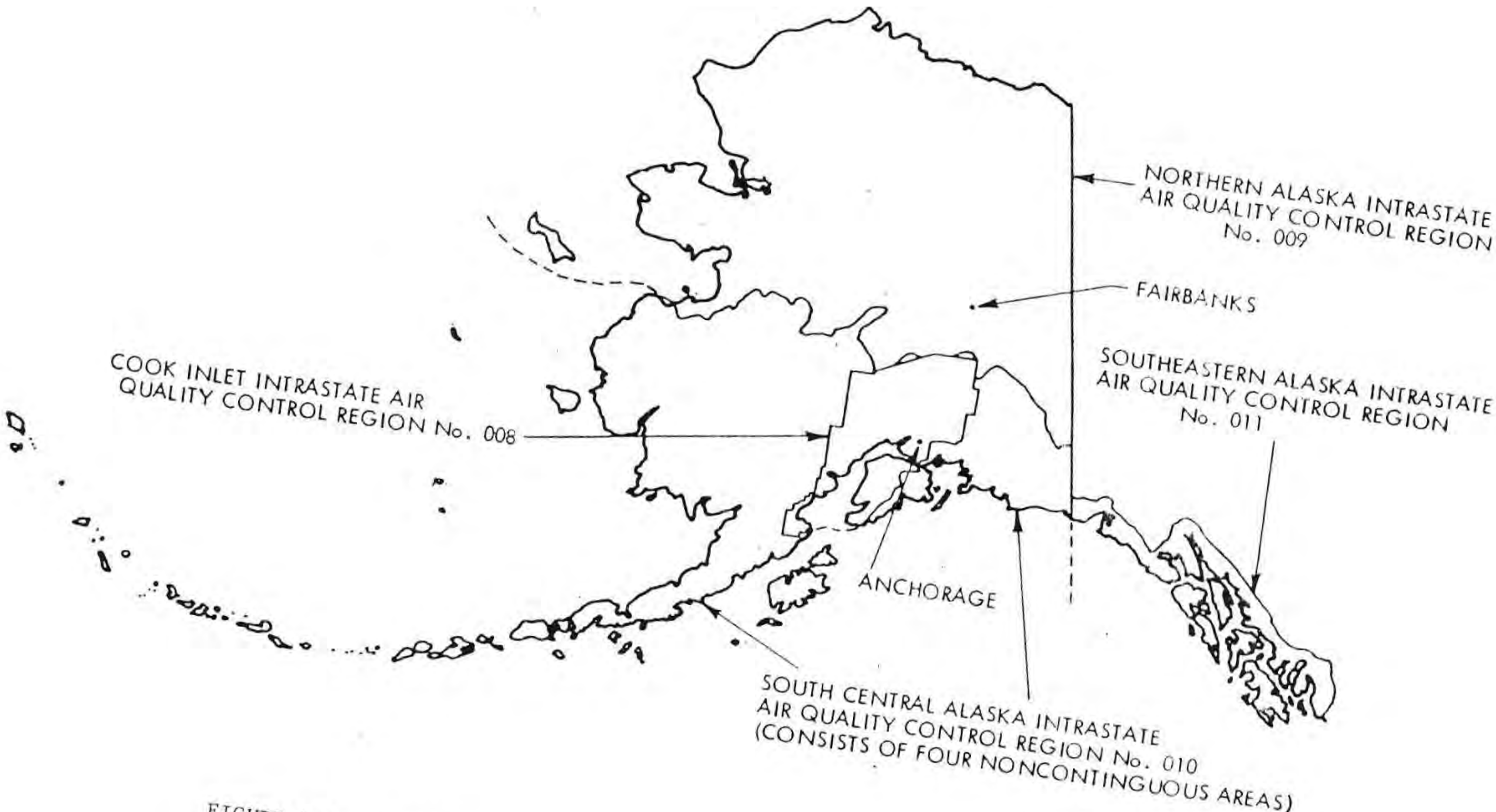


FIGURE I-1: ALASKA AIR QUALITY CONTROL REGIONS to oil and gas expansion. However, Prudhoe is not an area with a large permanent population as most of the workers live elsewhere and work there on shifts. The 1980 census population of this region was 81,626, of which 59,659 were in the Fairbanks area. This region contains the other nonattainment area in Fairbanks.

The Southcentral Intrastate Air Quality Control Region consists of four noncontiguous areas: the large area west of Cook Inlet Region; a large area east of Cook Inlet; Kodiak Island; and, the Aleutian Chain. The region is 180,000 square miles and is sparsely populated, 1980 census population of 48,902.

The Southeastern Air Quality Control Region, No. 10, consists of the panhandle of Alaska. It includes several islands and a small portion of mainland territory. It is approximately 35,000 square miles and has a population of 53,794.

## C. ATTAINMENT/NONATTAINMENT DESIGNATIONS

All regions in Alaska were evaluated for their compliance with the NAAQS. These standards are the same as those in Alaska Air Quality Control Regulation 18 AAC 50.020 for Total Suspended Particulate Matter, Carbon Monoxide, Ozone, Sulfur Dioxide, Nitrogen Dioxide, and Lead. As a result of that evaluation, the EPA made the following determinations:

A major portion of the Anchorage Urban area is in nonattainment with the carbon monoxide ambient air quality standards.

The Fairbanks and North Pole Urban areas are in nonattainment with the carbon monoxide ambient air quality standards.

All other areas of the state are in attainment with carbon monoxide standards.

All areas of the state are in attainment with total suspended particulate matter, ozone, nitrogen dioxide, sulfur dioxide, and lead ambient air quality standards.

The nonattainment areas are discussed in detail in this SIP revision, Section III.

## D. PREVENTION OF SIGNIFICANT DETERIORATION DESIGNATIONS

In addition to establishing nonattainment areas in the State, the 1977 amendments to the Clean Air Act (the Act) established a classification system to control new NAAQS pollutant emission sources.

The classification scheme is under Part C, Prevention of Significant Deterioration of Air Quality, Section 160-169 of the Act. The pollutants controlled are Total Suspended Particulates, Carbon Monoxide, Ozones, Sulfur Dioxide and Nitrogen Oxides, and Lead. The classification scheme applies to the entire state, but only to stationary sources. As Anchorage and Fairbanks are already classified nonattainment for carbon monoxide, they are classified for the other four pollutants under this system. The classifications are:

- Class I: This designation allows only new emissions to use up to approximately an incremental 10% of the NAAQS. This level nearly precludes any industrial growth.

  In Alaska four areas were designated by Congress as Class I - Mt. McKinley National Park, Tuxedni Wilderness Area, Bering Sea (St. Matthews Island) Wilderness Area and Simeonof Wilderness Area. Visibility in these areas is also regulated by ADEC as required by Section 169A of the Clean Air Act and 40 CFR part 51, Subpart P.

- Class II: This designation allows moderate growth, but assures that air quality will be maintained. It enables growth to use up to approximately an incremental 25% of the National Air Quality Standards. The rest of Alaska was designated Class II.

- Class III: This designation allows growth to use up approximately an incremental 50% of the NAAQS. No Class III areas have been designated or proposed in Alaska.

Although the Clean Air Act intended that air quality increments be established for all five NAAQS pollutants, increments have been established only for total suspended particulates and sulfur oxides. Therefore, the classification system is applicable only to those two pollutants.

The Act also allows the State the authority to reclassify areas of the State. The procedures for reclassification are guided by conditions contained in the Act. The procedures are detailed in 18 AAC 50.600 and are discussed in the appendix to Section IV of this volume.

The Act requires a mandatory preconstruction review and permit program for any new or modified major emitting facility as defined in the Act. Applicants must prepare a comprehensive analysis of air quality changes expected from the project and must obtain a permit prior to starting construction. Section IV of this volume discusses the permitting requirements in detail.

SECTION II

STATE AIR QUALITY CONTROL PROGRAM

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

## Section II

## STATE AIR QUALITY CONTROL PROGRAM

The State air quality control program is administered by the Department of Environmental Conservation, which is the primary agency for implementing the plan described in this document. The department is responsible for establishing the air quality standards throughout the State, and to insure that regulations are enforced statewide to maintain the standards. The department's air quality control efforts are described in the following sections.

Two local air quality control programs operate in the Fairbanks and Anchorage urban areas. Their efforts are concentrated on ambient air monitoring, enforcement of visible emission and dust control regulations, and development of ways to reduce carbon monoxide auto emissions. As a matter of policy the department encourages the development of strong local air quality control programs. The department provides technical assistance to insure that air quality objectives are satisfactorily carried out.

### Department of Environmental Conservation

Figure II-1 is the department's organization. The central office air quality control program is in the Environmental Quality Management Division's Air and Solid Waste Section. Two engineers and an ecologist are supervised by a third engineer, the air quality supervisor. The central office staff is responsible for air quality planning, policy and budget. It is responsible for SIP preparation and implementation and ensuring that the overall state air quality program is being effectively implemented. All permits with variances are handled by the central office as well as new source review and PSD procedures. Source testing and special ambient air quality monitoring programs are also directed by the central office.

The regional offices are responsible for permitting, enforcement of visible emission standards, conducting source inspections, and assisting in carrying out ambient air monitoring. The regional program efforts are supplemented by an air quality person in Anchorage and in Fairbanks. These positions are primarily related to automobile emission controls in those areas.

The department's laboratory assists in maintenance and operation of the statewide air monitoring network. It also assists in special monitoring projects. It is also responsible for conducting periodic emission source-testing in support of the program's stationary source compliance assurance efforts.

The department will provide technical assistance as needed to both local air quality control programs in Fairbanks and Anchorage. This will be particularly true in the area of auto emisson control devices, where there is considerable uncertainty on whether these devices are effective in cold climates. This is more fully described in Section III.

The department carries out enforcement of visible emission regulations on small stationary sources which are not covered by permit and are outside of local program jurisdiction. These field surveillance activities will be handled by the Department's regional personnel, along with control of open burning outside of the Anchorage and Fairbanks program jurisdictions.

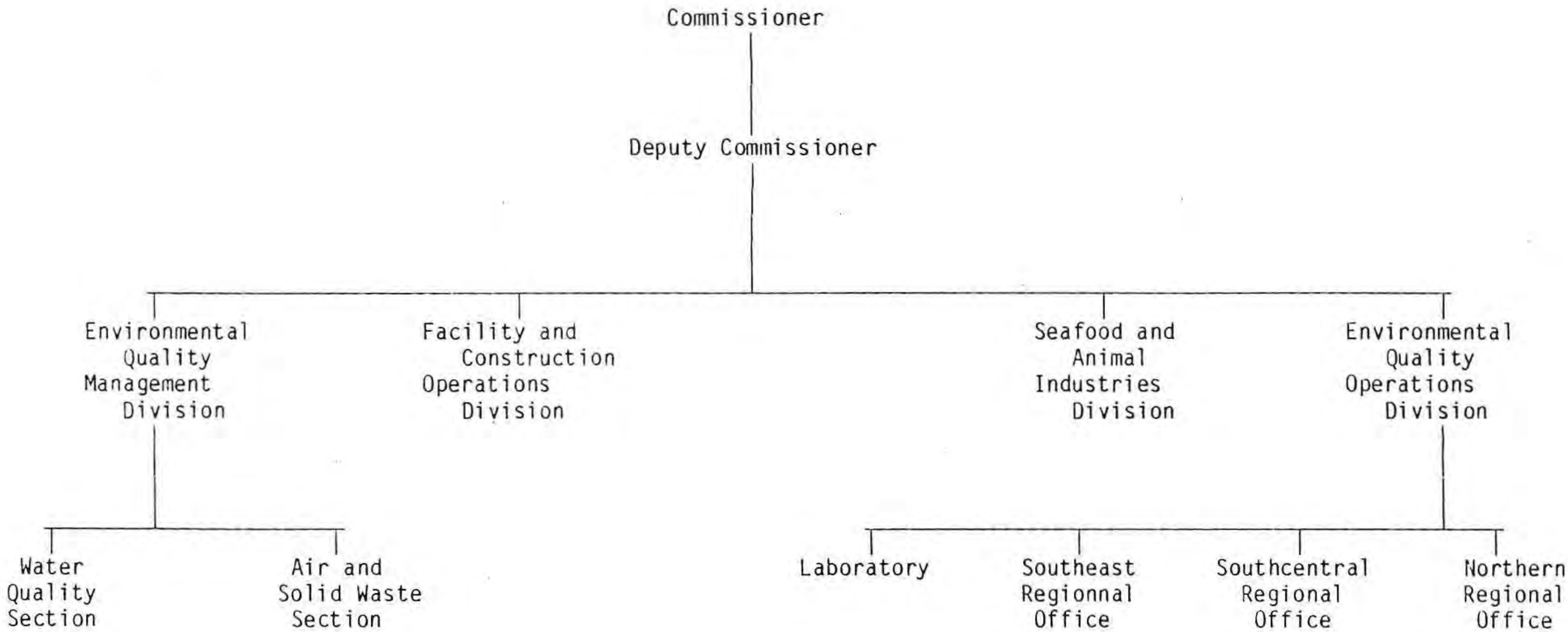


Fig. II-1 ADEC Organization

The Department of Environmental Conservation's legal authority is contained in Alaska Statutes 46.03, of which subsections 140-210 relate specifically to air quality, Appendix II.A. In 1972 the State of Alaska Department of Law determined that the Alaska Statutes 46.03 contained the necessary legal authorities as required by the Clean Air Act to carry out the statewide air quality control plan, Appendix II.A. This opinion identifies the prerequisite legal authorities for the State's air quality control program. It also covers the six basic legal requirements as identified in 40 CFR Part 51.11(a).

The department's air quality regulations are in 18 AAC 50, Air Quality Control Regulations. The 1982 revisions allowed assumption of the PSD program, New Source Performance Standards review for six sources, and other activities. These revisions are discussed in Section IV. The 1983 revisions adopted administrative procedures to maintain ambient air quality standards in locations where emissions from residential wood burning activities threaten public health. Open burning regulations were also modified. The Revised 1983 Regulations are included by reference in this document. They can be obtained from the Department upon request. discussed in Sections III, IV and V, as appropriate.

## Municipality of Anchorage

During the 1970's, the Anchorage Air Pollution Control Agency was known as the Cook Inlet Air Resources Management District. It was orginally formed as a triborough organization which was headquatered in Anchorage. The District included the Matanuska-Susitna and the Kenai Peninsula Boroughs as well as the Anchorage Municipality. As of June 30, 1979, the District was renamed the Anchorage Air Pollution Control Agency and has confined its control activities to the Municipality of Anchorage. The Municipality of Anchorage is also the official Metropolitan Planning Organization, responsible for the continuing, cooperative and comprehensive transportation planning process throughout the Municipality.

The legal authority for establishing a local air pollution control program is found in Alaska Statutes 46.03.210 LOCAL AIR POLLUTION CONTROL PROGRAMS. The original documents establishing a local air program are included in Appendix II. The 1980 Municipality ordinances are currently under revision. Once they are revised, ADEC and the Municipality will establish and agreement on the air program operation and responsibilities. The Ordinances and any agreements will be incorporated into the SIP at that time.

The Municipality air pollution control efforts invove the Muncipality's Planning Department and the Anchorage Air Pollution Control Agency. The Planning Department is responsible for developing the transportation control plan described in Section III.B. The Air Pollution Control Agency conducts the remaining local air pollution control program functions throughout the Municipality, as well as working with the Planning Department and Technical Committee on transportation control efforts.

Fairbanks North Star Borough

The Fairbanks North Star Borough has operated a local air pollution control program since 1972 through its Environmental Services Department. It reports to an Air Pollution Control Commission made up of nine members from the general public, and has its own Borough ordinance on air pollution control regulations. The legal authority for establishing local air pollution control programs is found in Alaska Statutes 46.03.210 LOCAL AIR POLLUTION CONTROL PROGRAMS. The Fairbanks North Star Borough'a air ordinances cover open burning, visible emissions from stationary sources, and emergency procedures. These ordinances have not undergone any major revisions in the past several years and are included in Appendix II.

The Fairbanks air pollution control efforts have concentrated on violations of the carbon monoxide ambient air quality standards. This is discussed in detail in Section III.C. The Borough has relied on the State to control large stationary emission sources within the Borough. The division of responsibilities between ADEC and the Borough was formalized in an Agreement of Responsibilities, signed by both agencies in July of 1975. This is included in Appendix II. ADEC is reviewing this document to ensure that its provisions are appropriate for the current programs. If any changes are needed, they would be formalized with the Borough and then incorporated into the SIP.

# SECTION III

# AREAWIDE POLLUTANT CONTROL PROGRAM

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

## Section III

## AREAWIDE POLLUTANT CONTROL PROGRAM

### A. STATEWIDE TRANSPORTATION CONTROL PROGRAM

#### 1. Cold Start Problem

Extremely stable inversions and still-wind conditions in many parts of Alaska produce the potential for high pollutant concentrations during the winter. In addition to these meteorological conditions which severely inhibit the ability of pollutants to disperse, there is the added difficulty of maintaining efficient combustion processes in cold weather. This is especially true for automobiles.

Many researchers in the United States and Canada have conducted studies in "cold rooms" or in cold ambient temperatures and agree that cold temperatures increase the total carbon monoxide (CO) emissions in a vehicle trip. Further, there is agreement that it is the initial phase of vehicle operation that is consistently high. This includes the cold start, which is defined as the first 4 to 8 minutes of engine operation when the choke is fully or partially engaged. The duration (and extent) of the cold start depends on many factors. Primarily, these are ambient temperature, soak time, engine design, emission control technology and degree of maintenance of the engine. The end of the cold start phase is not sharply defined but is generally regarded as the point when emissions have decreased (coincident with engine stabilization) to a level associated with warm idle. Carbon monoxide emissions during the engine warm-up period are high and may account for as much as 92 percent of the total vehicle trip emissions.

The present methods used in estimating motor vehicle pollutants do not realistically account for vehicle cold start emissions. The methods are based on the "average carbon monoxide emitted per vehicle mile travelled" throughout a driving cycle. This technique will provide misleading results since a large percentage of the total cold-weather pollutant output may be produced before the car is driven. Averaging the cold start emissions over the entire driving cycle will also produce erroneous conclusions if most of the total pollutants are emitted in the first half-mile of driving. Lengthy warm up periods are typical of cold-weather driving in Alaska.

Motor vehicle cold start emissions must be sharply reduced from current levels if the NAAQS for carbon monoxide are to be achieved in cold weather urban areas. Engine technology indicates that certain new vehicles are emitting less, but are falling short of the required 90% reduction required by the Clean Air Act. However, the Federal test procedure requires analyses of cars at 68°F - 86°F so the apparent reductions would not address cold start phenomena in any event.

2. Inspection/maintenance effectiveness

Most of the early testing to determine I/M's effectiveness had been done at warm temperatures and did not analyse its effectiveness in reducing emissions during the first few minutes of vehicle operation prior to vehicle movement. The lack of data available to evaluate I/M's effectiveness in low temperatures prompted the State of Alaska to develop a three year test program to evaluate I/M and other possible strategies such as retrofit, alternate fuels, and engine oriented special calibrations.

The winter of 1980-81 was devoted to performing 450 tests on testing 15 vehicles using an idle procedure at temperatures of 30°F+5. Vehicle idle emissions were collected in a "total capture method". Various maladjustments were administered, such as choke enrichment, idle speed changes, etc., to simulate typical maladies.

Tuneups were done on as-received vehicles according to manufacturer's specifications, but not tied to an idle standard. Overall, the results indicated no effectiveness of I/M at a 10% level of significance. This was attributed to the fact that the maintenance was not performed in terms of standards, but was simply "manufacturer's specifications."

Because dynomometer testing more fully characterizes emissions, ADEC acquired from EPA the Mobile Emission Test Facility (METFac) to conduct an expanded I/M program for winter 1981-1982. The program was developed to investigate the effectiveness of I/M, at temperatures that ranged from 80°F to 0°F. Fourteen vehicles ranging in model years 1976 to 1981 were tested. In this program, maintenance was performed on the vehicles with emphasis placed on carburetor adjustments to reduce CO to a specified standard.

Detailed reports of this test program are available from the State. However, from the cold weather data collected to date, from sources such as EPA, Environment Canada, Ford Motor Company, Department of Energy and the State of Alaska it appears that inspection and maintenance programs that emphasizes carburetor adjustments can be effective in reducing cold start emissions. The range of potential effectiveness of cold starts will fall between 4 and 20 per cent. The FTP range of potential effectiveness will fall between 12 and 35 per cent, depending on the specific needs of the user and how the I/M program is developed.

In order to develop more accurate estimates of I/M effectiveness and alternate approaches such as retrofit devices, the State of Alaska conducted the following tasks, using METFac during the winter of 1982/83: (All tasks at standard FTP temperatures and 20°F).

- Determined the effectiveness of carburetor adjustments and/or tune-ups in reducing cold start emissions on selected additional vehicles to augment winter 81/82 fleet tests.

- Evaluated retrofit devices for their effectiveness in reducing cold start emissions and in improving fuel economy and effects on drive-ability.

° Determined the effect of deterioration on last winters I/M vehicles, and the effect of retuning them.

° Developed emission factors at 20° for use in EPA Mobile 2 or 2.5. The factors were obtained from vehicles that are representative of actual vehicles registered in Alaska.

A final report on the state's two years of the METFac program are available upon request from the Department of Environmental Conservation in Juneau.

3. Agency Responsibilities

Department of Environmental Conservation

The Department of Environmental Conservation provides technical and resource assistance to the Anchorage and Fairbanks transportation control efforts. It is not directly responsible for implementation of any of the specific control actions - that is the responsibility and function of the lead agencies usually local agencies. The Department coordinates and insures that statewide air quality priorities and funding are accomplished in a rational and cost effective manner. In carrying out its functions, the Department is responsible for:

- Advising and assisting the Anchorage and Fairbanks staffs on developing transportation control plans.

- Coordinating and conducting the vehicle cold weather emissions evaluation, with assistance from the Anchorage and Fairbanks air pollution control programs, EPA and ADOT/PF.

- Maintaining an active participation in the Air Quality Technical and Policy Committees, which are set up as a supplemental part of the transportation planning process.

- Providing technical assistance and air quality evaluations of proposed transportation projects and plans. This will be direct technical support on an as-needed basis to the Department of Transportation and Public Facilities for the Anchorage and Fairbanks areas.

- Annually coordinating, reviewing and making recommendations to the appropriate agencies concerning air quality control efforts for the coming year, including placing a priority on available funds.

U.S. Environmental Protection Agency

The Environmental Protection Agency, because of its direct involvement in the federal motor vehicle emission control program, has major responsibilities in the successful carrying out of the Alaskan transportation control efforts. The agency has the obligation to insure that the federal motor vehicle control activities are effective in cold weather regions such as Alaska. It also must ensure that sufficient federal funding will be available to carry out the needed evaluation studies and control actions. In carrying out its functions, the Environmental Protection Agency is responsible for

- Establishing and enforcing a federal requirement that new cars will achieve the 90% pollutant reduction required by the Clean Air Act under all temperature conditions in which nonattainment occurs.

- Ensuring that Alaska has access to any available Federal funds for implementation of transportation control strategies.

° Providing technical assistance as necessary.
° Providing funding support for the needed local and state control actions and special study such as the Anchorage CO Program.

Municipality of Anchorage

The Municipality of Anchorage includes the Planning Department which is responsible for transportation planning and implementation, and the Transit Department which is in charge of carrying out the "People Mover" public transit system in Anchorage, and the Department of Health and Human Services which is responsible for the implementation of the Vehicle Inspection Program in Anchorage.

The Municipality of Anchorage is the lead governmental agency for carrying out the Anchorage Transportation Control plan, and as such is responsible to the following:

° Implementation of a Transportation Control Plan which includes inspection and maintenance and demonstrate attainment of federal standards by December 31, 1987. Implementation of the Vehicle Inspection Program will commence on July 1, 1985.

° Continue to evaluate and carry out the transportation planning activities to ensure the federal certification of the Anchorage Metropolitan Transportation Planning System (AMTPS).

° Continue to conduct ambient air and meterological monitoring, as needed, to fully characterize the carbon monoxide concentrations throughout the non-attainment area.

° Annually review and update the Anchorage Air Quality Plan, based on new data and ongoing control efforts through the Air Quality Technical and Policy Committee of AMATS.

° Establishing and implementing a carbon monoxide episode plan.

Fairbanks North Star Borough

The Fairbanks North Star Borough has primary responsibility for carrying out an effective transportation control plan for the area. However, it receives major assistance from the regional office of ADOT/PF because the Borough has not been designated for an official transportation planning process as in Anchorage. Its responsibilities are:

° Development, adoption and submission to the State and EPA on approvable transportation control plan which will show attainment of federal standards by December 31, 1987. Implementation of the plan.

° Conducting ambient air monitoring, as needed to fully characterize the carbon monoxide concentrations throughout the non-attainment area.

° Conducting a voluntary auto emissions evaluation program on an annual basis. (VEAP).

Department of Transportation and Public Facilities (ADOT/PF)

One of the key agencies is ADOT/PF, because of their role in both Fairbanks and Anchorage transportation planning and construction processes. While AMATS takes most of the planning responsibility from ADOT/PF in Anchorage, there is not a comparable organization in Fairbanks. The responsibilities of ADOT/PF are:

- Provide transportation planning and technical expertise in maintaining and improving the transportation system in Fairbanks.

- Provide technical assistance and support to AMATS in Anchorage as needed.

- Take an active part in the air quality transportation planning process, through the Air Quality Technical and Policy Committees.

- Incorporate the latest and most accurate air quality data and analysis techniques into transportation project evaluations, and in major corridor studies as soon as the information becomes available. Assistance and support will be provided by the Department of Environmental Conservation in this effort.

Federal Highways Administration (FWHA)

The Federal Highways Administration has the responsibility for insuring that federally funded transportation planning and construction in Alaska will be compatible with air quality objective and requirements. Therefore the FWHA will provide an important function to insure that air quality criteria are effectively carried out in these activities.

In particular, FWHA will be responsible for annually reviewing the Unified Work Program in Anchorage with all involved agencies, to insure that needed air quality activities are prioritized, funded and carried out. It will also be primarily responsible for insuring that the long range and short range transportation activities which are federally funded will be compatible with air quality requirements.

Index B. ANCHORAGE TRANSPORTATION CONTROL PROGRAM

Detailed information on the Anchorage Air Quality and I/M Program design may be found in Volumes 1 and 2 of the Anchorage Air Quality Plan, amendments to the Air Quality Plan, and the I/M Program Design Documents. These volumes are incorporated by reference into this SIP. They are available for inspection at the Municipality of Anchorage Planning Offices, the Department of Health and Human Services Air Quality Program's offices, and at the Juneau office of the Alaska Department of Environmental Conservation.

1. Planning Process

Interagency coordination

The Municipality, in cooperation with the Alaska Department of Environmental Conservation, Department of Transportation and Public Facilities, and the former Cook Inlet Air Resources Management District (now the Anchorage Air Pollution Control Agency), initiated a planning process to prepare a plan to obtain the national ambient air quality standards.

The planning process has been closely integrated and coordinated with the Anchorage Metropolitan Area Transportation Study (AMATS) because of the high ratio of automobile emissions to the total carbon monoxide emissions.

The Air Quality Planning Process which was established by these agreements provided for the creation of and Air Quality Planning Policy Committee, an Air Quality Planning Technical Advisory Committee and an Air Quality Citizens Advisory Committee. The Air Quality Policy Committee consists of the members of the AMATS policy committee. The Commissioner of the Alaska Department of Transportation and Public Facilities, the Mayor of Anchorage, and one assemblyperson from the Municipality of Anchorage. In addition, one of the municipal assemblypersons who is currently serving as a member of the local Air Pollution Control Commission, and the Commissioner for the Alaska State Department of Environmental Conservation serve on the Air Quality Policy Committee. The Air Quality Policy Committee has overall responsibility for the development, adoption and submission of an Air Quality Plan for the Municipality and State.

The Air Quality Planning Technical Advisory Committee consists of six members selected by the Policy Committee including one representative from the Municipal Health and Human Services Department, one representative from the Municipal Planning Department, one representative from the Municipal Transportation Department, one representative from the State Department of Environmental Conservation, one representative from the State Department of Transportation and Public Facilities, and one representative from the citizen advisory committee. The Technical Advisory Committee coordinates with the Air Quality Planning staff to develop an Air Quality Plan. They advise and submit recommendations to the Policy Committee.

The Air Quality Citizens Advisory Committee was established to provide immediate and ongoing input to the development of the air quality plan from private citizens. This committee consists of members from the Environmental Health Advisory Committee. To supplement this committee, the AMATS Citizen's Advisory Committee was used to provide as broad a spectrum as possible for citizen input. Many career and professional occupations are represented.

## Citizen Participation Program

The Clean Air Act Amendments of 1977 require that evidence of public involvement and consultation be shown. The air quality citizen participation program relies heavily on the public involvement program established by AMATS. The present AMATS Public Involvement Program consists of four basic elements: public hearings, workshops, and seminars, AMATS Annual Report and staff presentations to various groups and committees.

These elements have been adapted to the Air Quality Planning Program. Air Quality items have been included for review and comments in all of the basic elements. These elements should provide a thorough, balanced public involvement program including formal and informal review with final dissemination of information. The operation of this public involvement requires effort from all of the groups involved in interagency coordination.

Through the submission of the 1982 Air Quality Plan, various activities including public hearings and conferences were held. The transportation control measures were presented and discussed in a free form with the participants as well as before the Assembly.

Due to the need to evaluate the Fairbanks research, final commitments for the Vehicle Inspection Program were delayed until the completion of the Fairbanks study. After the completion of the study and evaluation of that information, the need for Vehicle Inspection Program was presented to the Assembly. During the development of the I/M Design Document with the Assembly, public hearings and testimony was taken as a regular part of that process. Public input was seriously taken with modifications resulting from some of that testimony before the Assembly. Public hearing and/or workshops with the Assembly were held on the I/M Program on September 20, 1983; February 20, 1984; March 13, 1984; and adoption of the final ordinances committing the Municipality to the Vehicle Inspection Program occurred before the Assembly on June 19, 1984.

A subsequent public hearing was then held by the State Department of Environmental Conservation on the regulations to be used to empower the I/M Program in Anchorage. The hearing was held on December 5, 1985, at the local office of the Alaska Department of Environmental Conservation. Testimony was taken and evaluated and the regulations were then advanced for adoption.

## Anchorage Municipal Organization and Authority

The Municipality of Anchorage Air Pollution Control efforts involve a Municipal Department and Agency, which together carry out the needed control activities. The Municipality's Planning Department is responsible for highway and transportation system planning, and for developing the transportation control plan. Implementation of this plan will be coordinated by the Air Quality Technical Committee with policy guidance from the Anchorage Air Quality Policy Committee. The Anchorage Air Pollution Control Agency is charged with the responsibility of conducting the remaining local air pollution control program functions throughout the Municipality, as well as working with the Planning Department and Technical Committee on the transportation control efforts. In addition, the Department of Health and Human Services Vehicle Inspection Program has the responsibility for the implementation operation of the Vehicle Inspection Program in Anchorage.

Legal authority for establishing a local air pollution control program is found in Alaska Statutes 46.03.210 Local Air Pollution Control Program.

2. Nonattainment Boundaries

The Clean Air Act Amendments became law in August 1977. The process identified areas of the Nation which failed to achieve and/or maintain the National Ambient Air Quality Standards (NAAQS). These areas were designated "nonattainment areas."

As a result of a monitor located at the corner of Seventh Avenue and "C" Street, Anchorage was declared a nonattainment area on January 27, 1978. A special monitoring study was then initiated in Anchorage to measure carbon monoxide concentrations at numerous locations.

The specific objectives of the study were to:

° Determine the nonattainment areas in Anchorage; and

° Measure existing concentrations for use in demonstrating the extent of the problem as related to transportation.

The data was collected and analyzed. The results of that data may be found in the 1979 Air Quality Plan. Figure B.2-a illustrates the nonattainment area determined by the special study conducted in 1978.

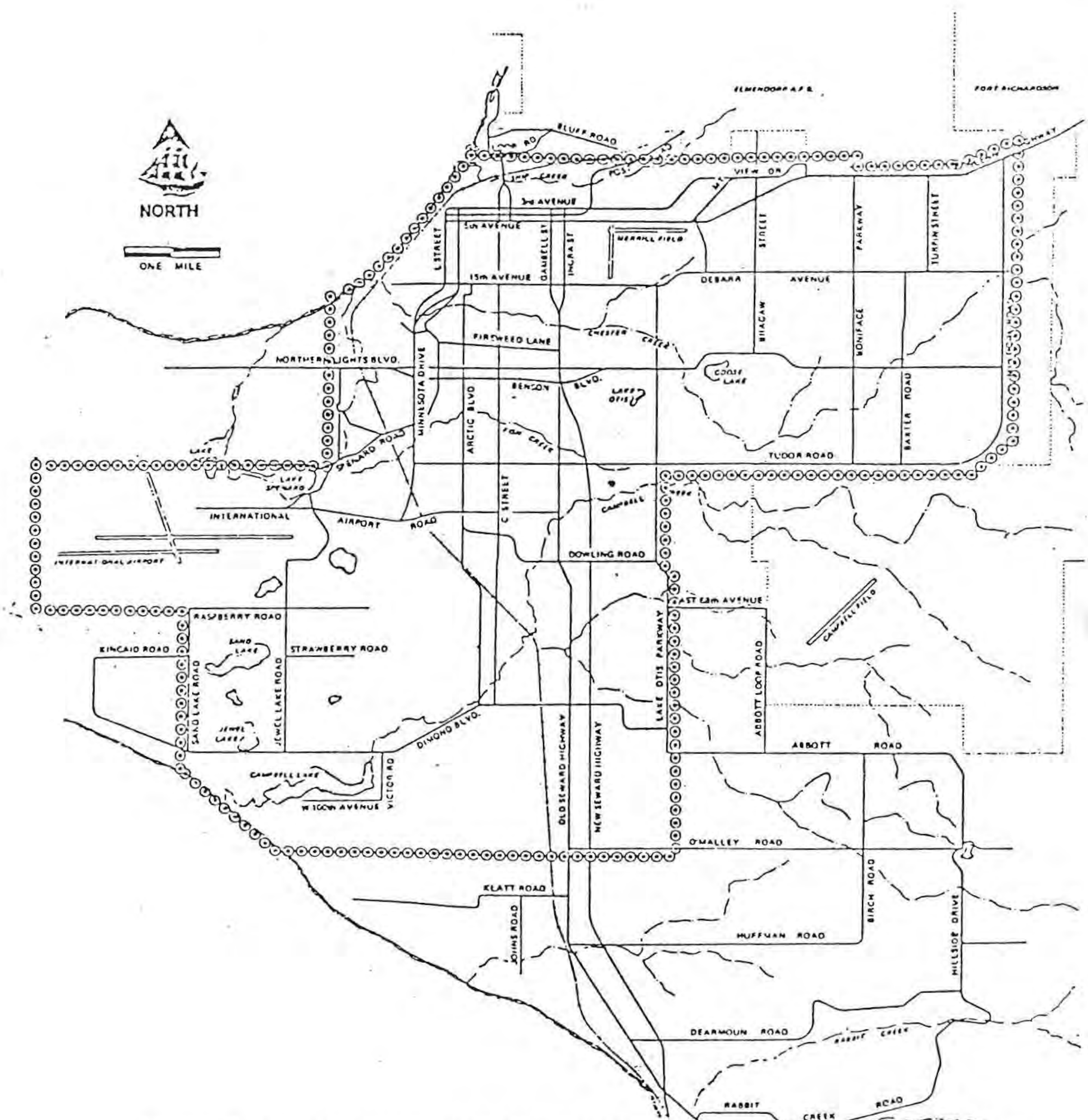


Figure B.2-a Anchorage Nonattainment Area

Boundary ⊙⊙⊙⊙⊙⊙⊙⊙⊙⊙⊙⊙⊙

3. Air Quality Emissions Data

Emission Inventory

In addition to the analysis conducted in 1978-1979, evaluation of current monitoring data has been conducted using EPA's rollback model. An emission inventory was conucted for a base year of 1980. Future emissions were then determined by using estimated future population. Table B.3-a compares the population projections used to determine the emission total with other adopted federal plans.

Because of the boom and bust economy, these population projections must be continually updated. Table B.3-b gives the current estimates for population. This estimate is being used in the Long Range Element which is undergoing a major update. The 208 Water Quality Plan currently being revised uses the population found in Table B.3-b.

The Air Quality Plan attempted to adjust for the difference between the projected population in Table B.3-a and the 1980 Census. Adjustments for the difference in the population were made in the emission inventory. Table B.3-c summarizes the grid by grid emissions 1980, 1982, and 1987. Emissions for all categories except highway vehicles were held constant due to the small incremental changes in dwelling unit growth and projected construction as they relate to the large contribution from motor vehicles. The complete emission inventory (on a grid by grid basis) may be found in Volume IV, "Anchorage Comprehensive Alternatives Analysis (1982 SIP Revisions)" and is available at the Municipality or Juneau DEC.

Table B.3-d provides a complete summary of the air quality data for the past 3 years ending December 1981. Appendix III.B.3-a has the graphs of the highest and second highest CO readings for each of the four sites.

Emission Reduction Targets

A statistical model was used to examine the problem and to determine the degree of control needed for attainment of the NAAQS. The model was calibrated using the monitoring data, and then used to determine the expected attainment date.

The results of this area wide model indicated that an average reduction of 23 percent from all transportation control measures would be necessary to achieve tha standards by 1987. This reduction is in addition to reductions expedited from the Federal Motor Vehicle Emission Control Program (FMVECP). This is discussed in more detail in B.8, Modeling.

Table B.3-a

Population Comparison for
Local Air Quality Plan

| Year | 208 Water Plan* AMATS | MAUS | 82 SIP Municipality | Bowl Only |
|---|---|---|---|---|
| 1975 | 176,787 | | | |
| 1980 | 210,994 | 205,775 | 205,200 | 169,300 |
| 1985 | 256,003 | 267,610 | 232,000 | 187,500 |
| 1990 | 308,295 | 317,934 | 276,000 | 220,500 |
| 1995 | 372,081 | 376,652 | 334,200 | 263,700 |

*These values are for the Municipality.

Since the Completion of the emission inventory, the U.S. Census Bureau has established the population for 1980 as 174,431.

Table B.3-b

Municipality of Anchorage
Population Projections 1980-2000[1]

| Year | Population | Year | Population |
|---|---|---|---|
| 1980 | 174,431[2] | 1991 | 251,736 |
| 1981 | 179,823[4] (187,761[3] actual) | 1992 | 257,356 |
| 1982 | 183,452[4] | 1993 | 263,364 |
| 1983 | 192,062 | 1994 | 268,715 |
| 1984 | 208,975 | 1995 | 275,424 |
| 1985 | 231,487 | 1996 | 283,488 |
| 1986 | 241,412 | 1997 | 292,793 |
| 1987 | 241,536 | 1998 | 301,854 |
| 1988 | 242,209 | 1999 | 309,548 |
| 1989 | 244,445 | 2000 | 318,366 |
| 1990 | 247,662 | | |

Source: 1 Institute of Social and Economic Research, 1981
2 U.S. Bureau of the Census, 1980
3 Municipality of Anchorage, Planning Department
4 Growth rates should be looked at for short term, 5 year, projections

## Table B.3-c

Total Annual CO Emissions
(tons/yr)

| Yr. | Residential fuel use | Commercial and Industrial fuel use | Point and area sources other than highway vehicles | Highway vehicles | Total |
|---|---|---|---|---|---|
| 80 | 329.4 | 2888.4 | 4826.5 | 56297.6 | 64341.9 |
| 82 | 329.4 | 2888.4 | 4826.5 | 52152.9 | 60197.2 |
| 87 | 329.4 | 2888.4 | 4826.5 | 41408.9 | 49453.2 |

Table B.3-d

## Air Quality Data For Each Site

| Seventh and C | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Highest* | 16.1 | 18.8 | 11.5 | 15.9 | 15.4 | 12.4 | 16.5 | 10.8 | 9.9 | 8.5** | 13.8** |
| Date | 1/9 | 1/7 | 11/17 | 12/7 | 1/19 | 1/6 | 1/2 | 11/19 | 11/13 | 1/23 | 12/7 |
| Second* | 14.5 | 18.6 | 11.5 | 14.1 | 13.1 | 11.1 | 15.4 | 10.0 | 9.1 | 8.5** | 7.6** |
| Date | 1/10 | 1/17 | 12/22 | 12/6 | 12/15 | 12/26 | 1/3 | 12/7 | 12/3 | 2/24 | 11/21 |
| **Spenard** | | | | | | | | | | | |
| Highest* | | | | | 21.7 | 20.0 | 27.4 | 17.4 | 21.6 | 20.3 | 17.1 |
| Date | | | | | 12/15 | 1/6 | 1/3 | 1/7 | 1/13 | 12/2 | 12/20 |
| Second* | | | | | 18.1 | 17.3 | 26.3 | 15.3 | 18.1 | 16.0 | 16.9 |
| Date | | | | | 12/21 | 1/18 | 12/10 | 11/20 | 12/3 | 1/23 | 1/14 |
| **Garden** | | | | | | | | | | | |
| Highest* | | | | | | 10.8 | 17.1 | 12.6 | 15.6 | 19.6 | 13.0 |
| Date | | | | | | 12/17 | 12/24 | 12/31 | 1/13 | 12/27 | 1/23 |
| Second* | | | | | | 10.1 | 16.8 | 11.3 | 13.9 | 18.0 | 12.9 |
| Date | | | | | | 11/30 | 1/2 | 12/2 | 11/9 | 12/26 | 12/14 |
| **Sand Lake** | | | | | | | | | | | |
| Highest* | | | | | | | 14.0 | 12.6 | 16.6 | 11.5 | 12.6 |
| Date | | | | | | | 12/8 | 12/7 | 12/3 | 12/2 | 12/20 |
| Second* | | | | | | | 14.0 | 11.3 | 11.9 | 11.4 | 11.6 |
| Date | | | | | | | 12/27 | 12/31 | 1/13 | 12.27 | 1/23 |

*Concentration in parts per million (ppm)
**Substantial amounts of missing data

4. Carbon Monoxide Monitoring Network Plan

An air quality monitoring network has been established for the Anchorage area. The objectives of this network are two-fold.

° To determine the concentrations of CO in several different urban settings. These settings include the microscale "hotspot", the middle scale, and the neighborhood scale.

° To monitor the concentrations of CO to evaluate the response to transportation control measures, and to assess reasonable further progress towards achievement and maintenance of the federal standard.

The monitoring network consists of four continuous CO monitors and seven temporary discontinuous monitors. The locations and names of the continuous monitors are as follows: 2902 Spenard Road (Spenard and Benson), 625 C Street (7th and C), 3340 Raspberry Road (Sand Lake), and 3000 E. 16th Street (Garden).

The Spenard and Benson monitor is a microscale "hotspot" site. The data from this monitor will be used to assess reasonable progress toward achievement and maintenance of the federal standard. The 7th and C monitor is a middle scale site, and the Sand Lake and Garden monitors are neighborhood scale sites. These latter three monitors are located to determine the spatial variation of CO concentrations, which is perhaps a more realistic estimate of actual individual exposures to CO. Data from all four monitors will be used to evaluate the trend of CO concentration response to transportation control strategies.

The discontinuous monitors will be employed in a variety of mobile modes as a secondary network to supplement the continuous monitoring network. The two objectives of this network are as follows:

° Verify the existence of local peak concentrations that have not previously been sampled.
° Conduct a periodic survey of concentrations at locations within the non-attainment area as required to develop specific trend information.

The Anchorage Air Pollution Control Agency (AAPCA) will operate a data acquistion and telemetry system for the continuous monitoring network. This system will provide real-time CO concentrations to the AAPCA office. This data will be used in conjunction with local weather service information for meeting the requirements of the CO episode plan.

The data acquistion system, which includes a microcomputer, will be used by the AAPCA to prepare and submit reports to the Alaska Department of Environmental Conservation (ADEC). ADEC will repair reports of the Anchorage Air Quality data for distribution to interested agencies. Results of special studies will be prepared for distribution following the completion of the studies. This reporting procedure will be used to assess the achievement and maintenance of the National Ambient Air Quality standards.

In order to determine if other existing or newly identified monitoring sites should be used, a special monitoring study was conducted in the fall of 1982. The purpose of this study was to identify the location for a permanent monitoring site in Anchorage and to evaluate the spatial characteristics of the CO problem in Anchorage. The actual monitoring program was mutually developed by AAPCA, ADEC, and EPA. The results of this study were used to redefine the design concentration. A detailed report of the study is available in a joint ADEC/EPA/MOA report published by EPA.

ADEC and Anchorage concurred that the data from the CO study indicated the Spenard and Benson site as representative of CO "hotspot". Therefore, based on the analysis of the CO study data and the last three years of monitoring data, the 18.1 part ppm second-high concentration recorded at Spenard and Benson during 1982 was selected as the new design value for the Anchorage non-attainment area.

5. Transportation Control Strategies

Six of the nineteen transportation control measures identified in the Clean Air Act were eliminated in the 1979 Air Quality Plan because they involved pollutants for which Anchorage was in attainment of the National Ambient Air Quality Standards. The remaining thirteen measures were evaluated in terms of their socio-economic, institutional, and environmental impacts. Volume IV of the Anchorage Comprehensive Alternatives Analysis contains the basic reports for each individual strategy.

Upon completion of Volume IV, the Anchorage Technical Advisory Committee grouped the individual strategies into nine separate packages. These packages contained a mixture of the individual strategies, with four of the nine packages being selected for their socio-economic, institutional, political, and environmental impacts to undergo a final air quality evaluation.

As a result of this evaluation, package 3 was selected by the Citizen Advisory Groups, the Technical Advisory Committee, and the Policy Committee. This group centers around transit and traffic improvements, a carpool/variable work hour program, and the implementation of a mandatory fleet/government Inspection and Maintenance (I/M) program with a voluntary I/M program for private vehicles.

Evaluation conducted since the initial analysis of the package indicates the reduction from two of the measures contained in this package would not reach the earlier estimates. The drop in reduction for carpool and transit is due to the availability of new data that would more accurately reflect the reductions for the proposed programs. The shortfall ranges from 9.4 to 14.1 percent.

Therefore, package 4 has been selected to replace package 3. This package requires a mandatory I/M program to be implemented in place of the basic I/M program in package 3. The estimated emission reduction from this package is between 16.7 and 31.4 percent, taking into account the revised estimates for carpool and transit. The most probable level is believed to be the median or 24.1 percent emission reduction.

The following discussion outlines the programs, giving estimated costs, implementation schedules, and program options using the cost analysis from the "Comprehensive Alternatives Analysis for Anchorage." Costs for individual programs may vary from these estimates due to increases in labor costs, inflation, and valuation of land required for the program. Detailed analyses are contained in Volume IV of the Anchorage Comprehensive Alternatives Analysis.

Traffic Improvements

There are a number of individual traffic engineering projects that are scheduled to be implemented during the next four years. The most significant project is traffic signal system improvements. The municipality is in the process of taking over signalization from the State. The signal system coordination is expected to be completed by January 1986.

In the analysis of traffic signal system improvements, the assumption of only peak hour benefits resulted in a daily average speed increase of approximately 19 percent. Using EPA's emission factors (Mobil 2) and the estimated VMT that would be affected by the speed increase, the estimated emissions expected after implementation of a signalization program were developed (Appendix III.B.5-a). On an average, emissions would be reduced over 10 percent in the impacted areas and four percent in Anchorage overall. The effects on off peak periods have not been quantified to date. As new data is available, it will be reported in the RFP reports.

The local Transportation Improvement Program (TIP) schedules improvements to the highway network over a period of 5 years. The actual completion dates for any of these improvements is contingent on the availability of local, state and federal funds; acquision of right-of-way; competitive bidding procedures; etc. Of the many projects listed in the TIP, eight major projects have been selected as being essential to the efficient movement of traffic within the nonattainment area. They are: A/C couplet, Minnesota Drive Extension, Spenard Road, Old Seward Highway, Elmendorf Access Road, Glenn Highway, Boniface Parkway, and Northern Lights Boulevard. These are described in more detail in Appendix III.B.5-a.

It is anticipated that no increase in traffic volumes over those already forecast will result from these improvements. Emission reductions will come from congestion relief and traffic diversion. Any change to these projects must be in accordance with procedures of the AMATS.

Inspection and Maintenance

Due to the nature of Anchorage's air quality problem, questions have been raised concerning the potential effectiveness of I/M in colder climates. The Environmental Protection Agency allowed the State of Alaska an opportunity to evaluate I/M to determine if it is effective under cold temperatures. The studies by ADEC indicate that I/M can reduce emissions by 4-12% during cold start.

Anchorage is developing a mandatory I/M program. Table B.5-a briefly describes the implementation dates, stringency (percent failures), and preliminary cut points (emissions standards) of the mandatory I/M program. These are estimates from early program design in late 1982; they are under revision and will be provided when available.

Table B.5-a

Anchorage I/M Program

Program: Mandatory vehicle inspection/maintenance

Stringency: 30%
(Percent of Vehicle Failures)

Estimated Cut points:
(Emission Standards)

| | A | B | C |
|---|---|---|---|
| pre-68 | 6.0% CO | 3.0% CO | 3.0% CO |
| 68-69 | 5.0% CO | 2.5% CO | 2.5% CO |
| 70-74 | 4.0% CO | 2.0% CO | 2.0% CO |
| 75-newer | 2.0% CO | 1.0% CO | 0.5% CO |

Implementation Schedule:

| | |
|---|---|
| July 1, 1983 | Construction of Facilities and Implementation of public information program. Staff hired and trained. |
| July 1, 1984 | Begin voluntary inspections as soon as facility is available. |
| July 1, 1985 | Inspections using Cut point A. Maintenance required. |
| July 1, 1986 | Continue inspections using Cut point B. Maintenance required. |
| July 1, 1987 | Continue inspections using Cut point C. Maintenance required. |

Table B.5-b outlines the estimated costs for the I/M program. They reflect estimates for decentralized and centralized program options.

Carpool/Variable Work Hours

Ridesharing continues to offer promise as an effective way of reducing vehicle trips and consequently VMT by increasing vehicle occupancy rates. The concept proposed for Anchorage would combine the duties of a ride share broker with the duties of variable work hours coordinator.

The estimated budget and staffing necessary to accomplish this program would be $113,300 for 1 manager, 2 clericals, publicity, printed material and office expenses.

The targeted goal for this program is to raise the automobile occupancy from 1.2 to 1.35 persons. The program will center on carpooling during the winter months. However, stressing the wintertime problems and the short-term requirements of the carpool should increase the likelihood of achieving the auto occupancies desired.

If the targeted goal is reached, the daily VMT will be reduced. This will provide a 2.5 percent reduction in CO emissions. If the effects of cold start are considered, this reduction could be increased to 12 percent according to a recent study conducted by Hoyles and Moyer, Alaska Department of Environmental Conservation 1981.

Transit

The most widely proposed strategy for reducing areawide carbon monoxide (CO) concentrations focuses on public transit improvements. Theoretically, improvements to an area's transit trips reduces the total number of vehicle miles traveled (VMT) region-wide and thereby reduces CO emissions. In the past, bringing about a significant change in travel mode from auto to transit has been particularly difficult to achieve through moderate investments in local transit.

Nevertheless, with the rising cost of gasoline, Anchorage has experienced increased patronage. Between 1978 and 1981, the revenue hours increased 27% while the ridership increased 94%. The ridership cycle - January through March, and September through December (the months most likely to have violations) - increased ridership. This pattern of ridership should help in obtaining the desired transit ridership during the winter months. Tables of ridership per month, revenue hours per month and passengers per revenue hour for the years of 1978-81 are available in Appendix III.B.5-c.

Table B.5-b

Estimated Costs For an
I/M Program In Anchorage†

| | Decentralized | Centralized |
|---|---|---|
| Annualized Number of Vehicles between 1985-1990 | 208,000 | 208,000 |
| Capital Costs | $ 125,000* | $ 0* |
| Program Start-Up Costs | $ 1,332,500/ 1,453,600* | $ 640,900/ 718,000* |
| Annual Operating Costs | $ 1,126,400/ 1,241,000 | $ 631,200/ 722,000 |
| Total Annualized Program Costs for Inspection Facilities (garages or central facilities) | $ 3,451,600 | $ 2,820,000 |
| Estimated Fee (± $ 2.00) | $23.29/$23.96 | $17.20/$17.22 |

* Estimated up front money needed from January 1984 through July 1985 for construction and operating costs. This money will be recovered in the fees.

† Provided by MOA, July 1983

The Municipality of Anchorage has established its transit program through the adopted Transportation Improvement Program (TIP). Table B.5-c outlines the program found in the draft 1983 TIP. This program is similar to the one contained in the adopted 1982 TIP.

The current passengers per revenue hour were obtained from the first 3 months of service in 1982. Incremental changes were then made to obtain the future year passengers per revenue hour assuming the latent demand would be satisfied by 1986. Any increased ridership would then be the result of increases in revenue hours.

The resulting ridership would provide an emission reduction of 8.9%. In attempts to reflect potential delays in funding, vehicle acquisition, and unforeseen factors that may result in a reduced transit fleet, Table B.5-d was developed. This table is not designed to be used for transit planning, but was developed to provide a potential range of reductions possible for transit (worst case analysis). The growth in ridership in this alternative would result in 25 passengers per revenue hour by 1987. This would provide an emission reduction of 4.2%.

## Table B.5-c

### Estimated Transit Operations

| Year | Anticipated New Units | Total Operational Fleet | Projected Annual Revenue Hours | Passengers Per Revenue Hour | Projected Operational Costs | Projected Capital Costs |
|---|---|---|---|---|---|---|
| 82* | 0 | 49 | 175,944 | 22.5 | 9,830,000 | |
| 83 | 23 | 56 | 208,260 | 26.5 | 11,985,000 | 3,360,000 |
| 84 | 42** | 98 | 307,024 | 30.2 | 18,111,000 | 5,992,000 |
| 85 | 20 | 116 | 330,395 | 32.0 | 20,075,000 | 3,206,720 |
| 86 | 20 | 136 | 373,764 | 34.6 | 23,958,000 | 3,430,120 |
| 87 | 25 | 161 | 427,873 | 34.6 | 29,485,000 | 4,588,000 |

*Base year
**Reflects the special funding request from the State Legislature.

## Table B.5-d

### Reduced Transit Operations for Air Quality Estimates Only

| Year | Anticipated New Units | Total Operational Fleet | Projected Annual Revenue Hours | Passengers Per Revenue Hour | Projected Operational Costs | Projected Capital Costs |
|---|---|---|---|---|---|---|
| 82* | 0 | 49 | 175,944 | 22.5 | 9,830,000 | |
| 83 | 23 | 56 | 208,260 | 23.0 | 11,985,000 | 3,360,000 |
| 84 | 20 | 76 | 238,100 | 23.5 | 14,046,000 | 2,996,000 |
| 85 | 20 | 94 | 267,734 | 24.0 | 16,268,000 | 3,206,000 |
| 86 | 20 | 114 | 313,302 | 24.5 | 20,083,000 | 3,430,000 |
| 87 | 10 | 124 | 329,542 | 25.0 | 22,709,000 | 1,835,000 |

*Base Year

6. Reasonable Further Progress

Reasonable Further Progress as defined in Section 171 (1) means annual incremental reductions in emissions which are sufficient to provide for attainment of the NAAQS by the required date. EPA has further defined the reductions necessary each year to be at least equal to those reductions achievable through a linear attainment program.

Improvements to the ambient air quality will be measured using data collected by the carbon monoxide monitoring network. In addition, the effectiveness of the transportation control strategies, as they are implemented, will be monitored. Indicators such as average daily traffic (ADT), vehicle miles traveled (VMT), average speeds, auto occupancy rates, and transit ridership figures will be analyzed and reported.

6/1/85

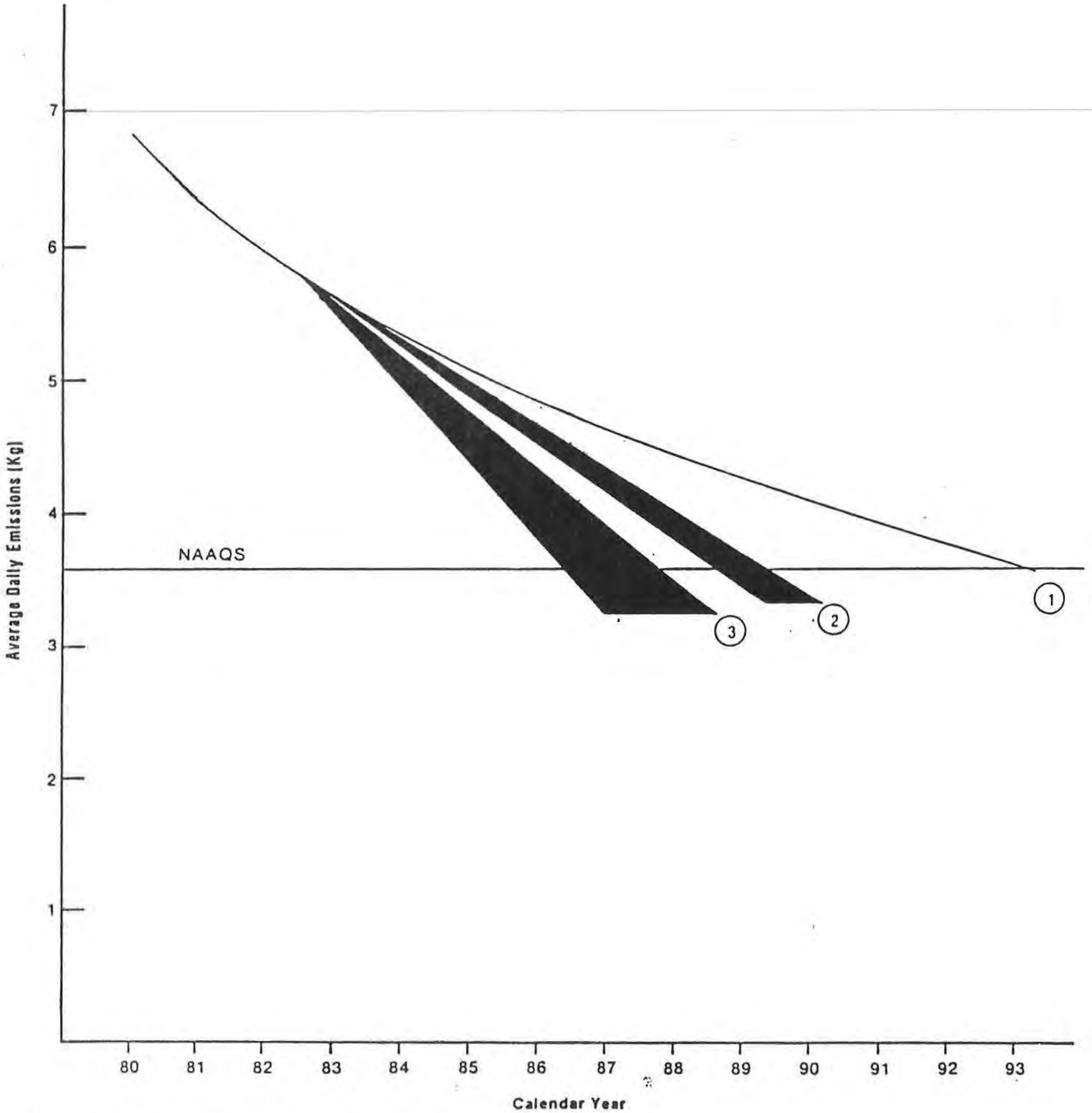


Figure B.6-a Estimated CO Emissions Seventh and "C" Street

(1) The effect of Federal Motor Vehicle Control Program (FMVCP).

(2) The effect of FMVCP and adopted Transportation Control Plan, without inspection and maintenance. Width of band represents range of effectiveness of strategies.

(3) The effect of FMVCP and adopted Transportation Control Plan, with inspection and maintenance. Width of band represents range of effectiveness of strategies.

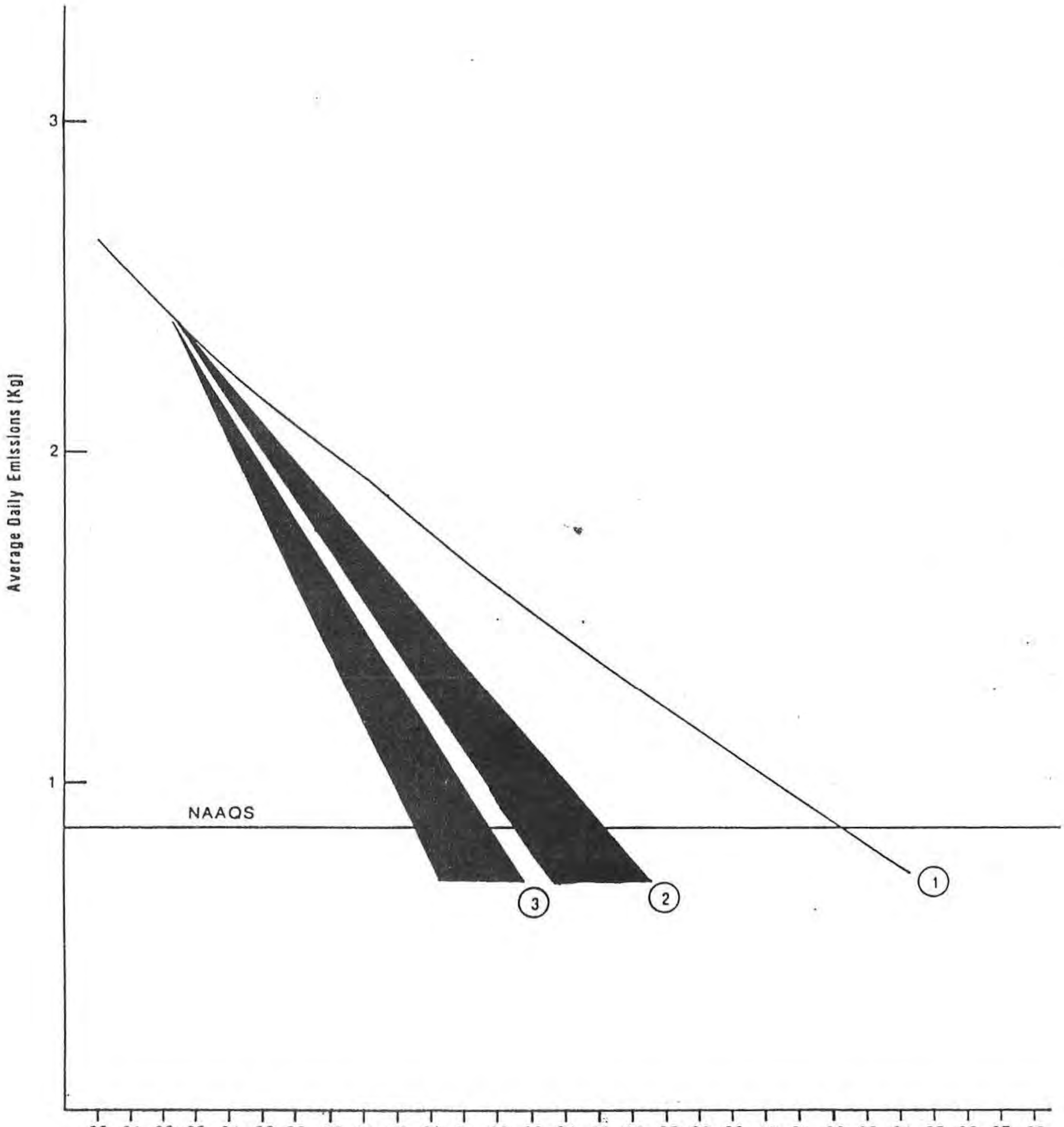


Figure B.6-b Estimated CO Emissions Spenard and Benson

1. The effect of Federal Motor Vehicle Control Program (FMVCP).
2. The effect of FMVCP and adopted Transportation Control Plan, without inspection and maintenance. Width of band represents range of effectiveness of strategies.
3. The effect of FMVCP and adopted Transportation Control Plan, with inspection and maintenance. Width of band represents range of effectiveness of strategies.

Municipality of Anchorage

OFFICE OF THE MAYOR

May 29, 1985

Bill Ross, Commissioner
Alaska Department of Enviromental Conservation
Pouch O
Juneau, AK 99811

Dear Commissioner Ross:

Enclosed is a copy of the amendments to the local portion of the State Implementation Plan. As you are aware, on June 19, 1984, the Municipal Assembly adopted AO 84-110 which established a mandatory inspection and maintenance program. The accompanying report should be included with the State Implementation Plan for air quality and submitted to EPA to demonstrate RFP and local commitment to improve air quality.

I would like to thank you for your time and assistance in this project, as well as your staff's assistance in the implementation of our air quality plan over the last two years.

Sincerely,

Tony Knowles
Mayor

Attachment

# ANCHORAGE AIR QUALITY PLAN

1985

## S I P  A M E N D M E N T

Prepared by:

Municipality of Anchorage
Department of Health and Human Services
Tony Knowles, Mayor

Revision 2

ALASKA VEHICLE INSPECTION AND MAINTENANCE PROGRAM

The 1983 revision to the State Air Quality Control Plan contained commitments from the Municipality of Anchorage to develop a vehicle inspection and maintenance (I/M) programs for implementation. Following the adoption of Assembly Resolutions 83-137 in Anchorage, a contractor was selected to assist in the development of specific I/M program designs for approval by the Assembly.

Detailed I/M program designs were developed for both contractor operated and private garage based programs. On June 19, 1984 the Municipality of Anchorage Assembly adopted Ordinance No. 84-110, implementing a private garage I/M Program effective July 1, 1985.

Following the adoption of specific, locally implemented I/M program by Anchorage, the Departmewnt of Environmental Conservation proposed, and subsequently adopted, regulations necessary to effect vehicle registration enforcement of the locally implemented I/M program, and to provide state assistance in support of the efforts of Anchorage to enforce specific program requirements.

Under EPA's 1982 SIP policy (46 FR 7182), a "checklist" covering twelve different areas defines the requirements of an approvable I/M program. Compliance with these EPA requirements has been achieved as summarized below:

1. Inspection Test Procedures - The I/M Program Design document (see enclosed copy) for the Anchorage program defines test procedures which include stringent tailpipe emissions standards in addition to visual and functional checks of emissions-related components.

2. Emission Standards - Twenty-nine emission standard categories have been established which cover all vehicles subject to the program.

3. Inspection Station Licensing Requirements - Licensing (certification) requirements for all facilities that will be performing inspections are described in detail in the I/M Program Designs. The requirements include the use of an emission analyzer that meets specifications contained in the I/M Program Design documents. The use of certified inspectors is also

required. To become certified, an individual must demonstrate proficiency in the areas of 1) I/M Program rules and regulations, 2) test procedures, 3) proper use of the emissions analyzer, which includes provisions for data recording and recordkeeping. Provisions for the periodic submission of data are provided through the monthly collection of cassette tapes from the Test Analyzer Systems by the Anchorage staff. Submitting to unscheduled audits of I/M station activities is a requirement of the program.

4. Emission Analyzer Specifications and Maintenance/Calibration Requirements - Minimum analyzer specifications are provided; however, the basic requirement is for the use of an analyzer which has been certified by the I/M Program Administration Office.

5. Recordkeeping and Record Submittal Requirements - As discussed above, routine collection of inspection data contained on cassette tapes will be performed. In addition, each Certified I/M Station is required to maintain copies of work orders and Certificate of Inspection receipts for review by the Program Administration Office. Data collected on the cassette tapes will be sufficient to provide reports on 1) number of vehicles inspected, 2) number of vehicles passing initial inspections, 3) number of vehicles passing after retest, 4) number of vehicles receiving waivers, and 5) number of Certificates of Inspection issued. Other data recorded by Anchorage will enable the reporting of 1) number of penalties imposed for non-compliance, 2) number of I/M station and mechanic certifications suspended or revoked, and 3) total number of I/M stations and mechanics with valid certificates.

6. Quality Control, Audit, and Surveillance Procedures - Formal quality control procedures are described which must be followed by each inspection facility, and quarterly audits of the station will be conducted by I/M Program Administration Office staff. The audits will include 1) a check of required records, 2) a gas calibration check of the emission analyzer, and 3) a check to determine whether prescribed regulations and procedures are being followed. Penalties for violations of I/M Program requirements are described in the I/M Program Design documents. The penalties include revocation of certification for repeated or serious offenses.

7. Procedures to Assure that Non-Complying Vehicles are Not Operated on Public Roads - For most vehicles subject to the program, compliance is assured through the fact that proof of compliance with the I/M Program requirements must be demonstrated prior to registration renewal by the Division of Motor Vehicles.

8. Other Official Program Rules, Regulations and Procedures - The Anchorage I/M program document includes 1) areas subject to the program defined by zip codes, 2) a specified start-up date of July 1, 1985, 3) operation of a Referee Facility to resolve disputes between motorists and Certified I/M Stations, and 4) a well-defined ~~class~~ of vehicles subject to the program.

9. Public Awareness Plan - The public awareness plan for the I/M program is still under development; however, several elements of the plan have already been resolved and implementation is underway. These elements include 1) motorist notification of I/M program requirements through mail-outs from the Division of Motor Vehicles, 2) plans for press events associated with the certification of the first I/M Stations with a demonstration of how the inspection is performed for representatives of both the print and electronic media, 3) plans for special training of DMV personnel to ensure that they can effectively communicate the program requirements and the need for the program to motorists who do not read or understand the notice they receive from DMV, 4) scheduling of briefings for editorial boards and automotive writers to ensure that they are informed of how the program works and why it is needed before the start of the program, and 5) installation of adequate phone services for the I/M Program Administration Offices in conjunction with training on how to handle questions and complaints about the program received from the public.

10. Mechanics Training - Through the Alaska Vocational Technical Center (AVTEC), a 40-hour mechanics training course has been developed. The training course is suggested for all mechanics who are unable to pass a stringent qualification test for certification to perform inspecitons or repairs under the I/M programs. The course requirements, which are specified in the I/M Program Design document, include training in 1) proper use of the analyzers, 2) local I/M program requirements, 3) basic information on the type of failures that will need to be corrected, and 4) diagnosis and repair proce-

dures, including proper air/fuel ratio adjustment methods. Based on the results of qualification tests given to date, approximately 90% of the mechanics participating in the I/M program can be expected to take the training course (i.e., the failure rate on the qualification test is about 90%). Several training courses have already been given and most mechanics can pass the qualification test after they have completed the course. Because of the incentives built into the program for the use of certified mechanics in the performance of repair work, most motorists can be expected to have repairs performed by certified mechanics. There are no waivers for vehicles which fail an after-repairs test, therefore, the motorists will either use certified mechanics or continuing attempting to have non-certified repair work done until the vehicle passes.

11. Basic SIP Requirements:

Evidence of Legal Authority: Statutory authority for the Alaska I/M programs is explained in a December 1, 1983 memorandum from Sierra Research, contractor to the Department, to Leonard D. Verrelli. A copy of the memorandum is appended, along with copies of the relevant statutes cited in the memorandum. Also appended is a February 22, 1984 memorandum from Assistant Attorney General, Douglas Mertz, which indicates concurrence with the above referenced December 1, 1983 memo. Also appended is the final version of the ADEC regulations which implement the statutes requiring DMV participation in the process.

Commitment to Implement the Program - The 1983 revisions to the State Air Quality Control Plan contained a resolution from Anchorage indicating a commitment to develop and implement I/M. The appended ordinances 84-110 from Anchorage reinforces this commitment and provides greater specificity.

Commitment of Resources: Funds required for the design and start up of the program have already been appropriated. As indicated in the ordinance adopted by Anchorage, the program will be self-supported through the sale of certificates of inspection (for administration and enforcement costs) and inspection fees (for operation of the private I/M stations).

12. RACT Compliance - As is evident from the preceding SIP revision, EPA's MOBILE3 emissions model has been used to determine the effect of the speci-

fic I/M program designed for Anchorage. The model indicated that emission reductions due to the model will be substantially in the excess of the 25% required for an approvable program.

Submitted by: Chairman of the Assembl
at the request of the Mayo
Prepared by: Department of Law
For Reading: May 22, 1984

DATE 6-19-84

ANCHORAGE, ALASKA
AO No. 84- 110

AN ORDINANCE ADDING A NEW CHAPTER 15.80 TO THE ANCHORAGE MUNICIPAL CODE ESTABLISHING A VEHICLE INSPECTION AND MAINTENANCE PROGRAM

THE ANCHORAGE ASSEMBLY ORDAINS:

Section 1. A new Section 15.80.010 of the Anchorage Municipal Code is enacted to read as follows:

15.80.010 Inspection and Maintenance of Motor Vehicles.

A. Every owner of a vehicle registered within the Municipality of Anchorage shall have each such vehicle inspected and maintained in accordance with the requirements specified in the document entitled "I/M Program Design, Municipality of Anchorage, Private Garage Option" dated May 3, 1984 and referred to as the "I/M Program Design." The I/M Program Design is adopted by reference as part of this ordinance, as are measures adopted by the Program Administrator pursuant to Paragraph I of this section.

B. Every owner of more than ten (10) vehicles which are primarily used in the Municipality of Anchorage shall have such vehicles inspected and maintained in accordance with the requirements of the I/M Program Design regardless of whether such vehicles are registered with the Municipality of Anchorage.

C. A Certificate of Inspection issued in accordance with the procedures specified in the I/M Program Design shall be required prior to vehicle registration or vehicle registration renewal with the Alaska Division of Motor Vehicles for all vehicles subject to the requirements of the I/M Program Design.

D. The Director of the Department of Health and Environmental Protection shall have principal responsibility for the implementation and enforcement of the I/M Program and shall designate one employee of the Department as the I/M Program Administrator.

E. The I/M Program Administrator shall certify mechanics, vehicle test or service facilities (stations), equipment and training courses meeting all certification requirements specified in Section 4 of the I/M Program Design.

F. All inspections, ~~repair and maintenance~~ required under the I/M Program Design shall be done in a manner consistent with the requirements of Section 7 of the I/M Program Design when performed by certified I/M stations.

G. Certifications shall be suspended or revoked by the I/M Program Administrator for repeated or serious violations of procedures or requirements specified in the I/M Program Design.

H. No facility may advertise itself as a Certified I/M Station unless it is certified as such by the I/M Program Administrator.

sixty (60)

I. Upon ~~thirty (30)~~ days' advance notice to certified I/M stations and the public, the I/M Program Administrator shall make such changes to the I/M Program Design as are necessary to:

1. maintain an overall failure rate of 30 percent or less; and

2. require the use of inspection and repair procedures which are cost-effective and which reflect changes in the motor vehicle fleet.

J. The Program Administrator shall sell blank Certificates of Inspection to certified I/M stations for a fee not to exceed $10.00. The same fee shall be charged for Certificates of Inspection issued by the Program Administrator to vehicles qualifying for a waiver under the I/M Program Design. The precise level of the Certificate of Inspection fee shall be established based on the cost of operating the Program Administrator's office and shall from time to time be modified to reflect changes in the Program Administrator's office operating costs.

K. *

** Section ~~2.~~ 3.This ordinance shall be effective immediately upon passage and approval by the Assembly.

AO No. 84-110
Page 3

PASSED AND APPROVED by the Anchorage Assembly this 19th day of June, 1984.

Chairman

ATTEST:

Deputy Municipal Clerk

*K. An average of four (4) random checks per year per inspection station shall occur.

** Section 2. That the referee station as anticipated in this plan shall be offer[illegible] for operation by the private sector.

NOV 7 1984
Rec D.C.
HEP S/P

ATTACHMENT A

AMENDED AND APPROVED

DATE 5-24-83

Submitted by: Chairman of the Assembly
At the Request of
the Mayor

Prepared by: Department of Community
Planning

For Reading: May 24, 1983

Anchorage, Alaska
AR No. 83- 137

A RESOLUTION APPROVING THE IMPLEMENTATION OF A MANDATORY VEHICLE INSPECTION/MAINTENANCE PROGRAM FOR ANCHORAGE.

WHEREAS, carbon monoxide and other air pollutants emanating from petroleum-fired vehicles are injurious to man, causing or accelerating a variety of serious, even fatal, disorders; and

WHEREAS, the National Ambient Air Quality Standards for carbon monoxide were based on these health impacts of carbon monoxide at low levels; and

WHEREAS, the ambient concentration of carbon monoxide in Anchorage occasionally exceeds the National Air Quality Standards; and

WHEREAS, the Clean Air Act identified potential strategies to reduce carbon monoxide; and

WHEREAS, the research in Fairbanks on the effectiveness of inspection and maintenance (I/M) has shown I/M to be effective; and

WHEREAS, additional reductions are necessary to achieve the National Air Quality Health Standards; and

WHEREAS, an I/M program must be mandatory to be effective;

WHEREAS, an actual commitment to implement an I/M program is required in order for Anchorage's air quality plan to be approved by EPA.

NOW, THEREFORE, THE ANCHORAGE ASSEMBLY RESOLVES:

The following actions shall be noted and taken:

1.) The implementation of a mandatory vehicle inspection/maintenance program/IS A REASONABLE and necessary step towards achieving the National Ambient Air Quality Standards. An amendment to the local Air Quality Plan calling for inspection and main- including fed state and municipal vehicles.

tenance should be forwarded to the State for inclusion in the State Implementation Plan.

2.) The Administration is requested to implement the I/M program in accordance with the ~~adopted/SIP~~ Assembly relative to the requirements for stringency ~~and~~ conditions of active operation of the project by July 1, 1985.

3.) The Administration should immediately apply for available technical and financial assistance, from the State and EPA, for this program.

4.) The Administration should provide to the Assembly on July 12, 1983, program design and options.

5.) AR No. 83-92 is repealed.

ADOPTED by the Anchorage Municipal Assembly this 24th day of May, 1983.

Chairman

ATTEST:

Municipal Clerk

rk2/nr6

POINT SOURCE CONTROL PROGRAM REVISIONS

The 1983 SIP does not contain a "growth allowance" for emissions from stationary sources in the non-attainment areas of Anchorage. In addition, EPA has questioned the authority of Anchorage to enforce recordkeeping, reporting of emissions, and other miscellaneous requirements for stationary sources. ADEC is expected to address these concerns through modification of its regulations covering permit requirements for stationary sources.

The revisions will constitute the creation of a "New Source Review" rule, under which offset requirements will be established for major stationary sources. It is proposed that no net emission increase be permitted for new or modified major sources whenever emissions from the source would impact adversely on a non-attainment area. In addition, the proposed rule involves reporting requirements and access requirements to ensure that ADEC and local air pollution control officials will be able to obtain all necessary information. The adoption of the proposed rule under state law should eliminate any concerns EPA has regarding the ability to obtain injunctions in cases of non-compliance.

7. Conformity

U.S. Department of Transportation rules require that the Regional Transportation Plan and Transportation Improvement Program (TIP) conform with State Implementation Plans (SIP). Conformance of transportation plans and programs will be determined by the following:

a. The plans and programs will be reviewed for projects that qualify as Transportation Control Measures (TCM) or that clearly support transportation strategies presented in the SIP.

b. Compare the TIP projects with TCM's in the SIP and identify those TCM's that are not programmed in the TIP.

c. Identify those TCM's included in the annual element by type (transit, ridesharing, traffic, etc.).

d. Determine if any projects in the annual element adversely affect the TCM's contained in the SIP.

e. The AMATS Air Quality Policy Committee, using the information above, will then determine that the plans and programs are in conformance if they:

   ° reflect reasonable progress in implementing those transportation control measures that are called for in the SIP to meet air quality standards; and

   ° do not include actions that would reduce the effectiveness of planned transportation control measures.

f. The AMATS Air Quality Policy Committee's determination of conformity will be included in the TIP and submitted to ADOT/PF and UMTA.

g. After determining conformity of the plans and programs, all Federal Aid projects will still be evaluated in accordance with procedures specified in the National Environmental Policy Act. For major projects which require an Environmental Impact Statement (EIS), a microscale air quality analysis will be performed. If the analysis indicates that the project will create new violations or exacerbate existing violations then, according to State Statutes referenced in this SIP, the project will not be constructed. An exception to this prohibition will be those projects which provide a net areawide air quality benefit and does not delay attainment of the National Ambient Air Quality Standards.

h. Items (a) through (g) apply to the Anchorage nonattainment area. Any projects located in an attainment area will be subject to the provisions of the State Air Quality Statutes.

8. MODELING

REVISED AIR QUALITY ANALYSIS AND ATTAINMENT FORECAST FOR ANCHORAGE

During preparation of the State/EPA Agreement, EPA has indicated that it expected SIP revisions as a result of the '82-'83 CO Study in Anchorage. ADEC and Anchorage concur that data available from the CO Study indicates that the Spenard and Benson monitoring site is more representative of community exposure to CO than the 7th and C Street site which served as the basis for the quality analysis contained in the 1983 SIP in Section III.B.3 through III.B.6.

Based on our analysis of the CO Study data, the 18.1 ppm second-high concentration recorded at Spenard and Benson during 1982 should serve as the new design value for the Anchorage non-attainment area. The anticipated VMT growth rate in the vicinity of the monitor is estimated at 1.5%. This is midway between the maximum growth rate expected at congested intersections (1.0%) and the area wide growth rate of 2%. Using a background concentration of 1.0 ppm, the required emission reduction needed to achieve attainment is calculated as follows:

$$(18.1 - 9.3) / (18.1 - 1.0) = 51.46\%$$

EPA's MOBILE3 emissions simulation model has been used to calculate the projected ambient CO levels in future years. The temperature was set at 20 degrees F and default values were used for average speed, cold start fraction, hot start fraction, stabilized fraction, and vehicle mileage. Anchorage registration data were used to determine the proper fleet mix. I/M credit calculations were based on a 20% stringency for tailpipe emission standards plus anti-tampering. In order to account for the fact that the Anchorage I/M program starts in mid-year, MOBILE3 was run twice, once for an assumed January 1, 1985 program start date and once for an assumed start-up date of January 1, 1986. The results of both runs were averaged together to estimate the effect of a program starting in mid-1985.

Table B.8-a is the projected CO concentrations through the year 2001. Graphical representation is found in Appendix III.B.8-a. Due to rounding errors, the Seventh and "C" monitor appears to reach attainment in 1983 without the implementation of any control measures.

By evaluating each site for 1987, the percent reduction necessary to obtain the NAAQS by December 31, 1987, would be as follows:

| | |
|---|---|
| Seventh/"C" | 22.5% |
| Spendard/Benson | 56.4% |
| Garden | 30.8% |
| Sand Lake | 20.4% |

These percent reductions may be revised pending approval and release of the 1982/1983 Anchorage Winter CO Study.

Basic meterological data is available for each site from the local air pollution control agency. The data is not included in the State Implementation Plan (SIP), but is available upon request from the Anchorage Air Pollution Control Agency.

## Table B.8-a Rollback Model CO Projections

| | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seventh and "C" | | | | | | | | | | | | | | | | | | | | | | |
| Rollback | 15.4 | 14.7 | 14.2 | 13.8 | 13.2 | 12.3 | 11.5 | 11.0 | 10.5 | 10.0 | 9.7 | 9.3 | 9.2 | 9.0 | 8.9 | 8.9 | 8.8 | 8.8 | 8.8 | 8.9 | 8.9 | 9.0 |
| Spenard and Benson | | | | | | | | | | | | | | | | | | | | | | |
| Rollback | 26.3 | 25.2 | 24.2 | 23.5 | 22.6 | 21.1 | 19.7 | 18.8 | 18.0 | 17.2 | 16.6 | 16.1 | 15.8 | 15.5 | 15.4 | 15.3 | 15.2 | 15.2 | 15.3 | 15.3 | 15.4 | 15.6 |
| Garden | | | | | | | | | | | | | | | | | | | | | | |
| Rollback | 16.8 | 16.1 | 15.5 | 15.1 | 14.6 | 13.6 | 12.7 | 12.2 | 11.7 | 11.2 | 10.8 | 10.5 | 10.3 | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.1 | 10.2 |
| Sand Lake | | | | | | | | | | | | | | | | | | | | | | |
| Rollback | 14.0 | 13.6 | 13.2 | 12.9 | 12.5 | 11.8 | 11.1 | 10.7 | 10.3 | 9.9 | 9.7 | 9.4 | 9.3 | 9.2 | 9.2 | 9.2 | 9.2 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 |

9. Contingency Plan

Should the Alaska Department of Environmental Conervation (ADEC) determine that Reasonable Further Progress is not being made, it may call for a revision to the SIP. In such case, the Municipality of Anchorage would institute a contingency plan as described in Appendix III.B.5-b.

The contingency plan has three parts. First, the current Transportation Improvement Program would be reevaluated to identify projects that may be delayed while the SIP is being revised (if Anchorage should exceed a population of 200,000). Second, committed Transportation Control Measures (TCMs) would be identified for acceleration. Third, adddiditional TCMs would be identified, analyzed and selected for implementation. Interagency agreements would be used to delay, accelerate, or implement TCMs.

Submitted b_ Chairman of the Assembly
at the Request of the Mayor
Prepared by: Department of Law
For Reading: July 22, 1986

DE

APPROVED
Date: 9-9-86

ANCHORAGE, ALASKA
AO NO. 86-111

AN ORDINANCE AMENDING ANCHORAGE MUNICIPAL CODE 15.30.060 AIR POLLUTION EPISODE CURTAILMENT ACTIONS.

THE ANCHORAGE ASSEMBLY ORDAINS THAT:

Section 1. Anchorage Municipal Code subsection 15.30.060(A) is amended by the addition of a new paragraph to read as follows:

1. Pre-Alert

   a. carbon monoxide: 10 milligrams per cubic meter or 9 parts per million (8-hour average);

Subsequent paragraphs of this subsection shall be renumbered by the revisor of ordinances.

Section 2. Anchorage Municipal Code subsection 15.30.060(B) is hereby amended to read as follows:

B. With the concurrence of the mayor of an affected member government, the director shall prescribe and publicize curtailment actions under the circumstances described in this subsection when the concentration of air contaminants has reached or is predicted to reach any of the levels set forth in subsection A. Curtailment actions for each episode level must be implemented when an episode level is declared. An episode level must be declared by the director or his designee when concentration reaches or exceeds the concentration set for that level and is predicted to either remain at that concentration for 12 hours or reach that concentration again within the next 24 hours. Once an episode level is declared, actions mandated for that episode level must be continued until measurements indicate that another level (either lower or higher) has been attained. Actions for the next level must then be implemented. This procedure must continue until the episode ends. The Anchorage Air Pollution Control Agency shall maintain an air episode log describing each instance during which any of the levels described in this section are reached and the reasons why the level was declared.

Section 3. Anchorage Municipal Code subsection 15.30.060(B) is further amended by the addition of the following paragraphs:

1. Pre-Alert. The director or his designee shall declare that a pre-alert episode level exists when ambient concentration equals or exceeds the concentration set forth in Section 15.30.060(A)(1). When a pre-alert episode level is declared, the Anchorage Air Pollution Control Agency shall:

   a. Notify the news media of the pre-alert declaration by means of a statement describing the reasons why the declaration was made.

   b. Check the sites where the levels were detected at appropriate intervals.

   c. Interpret 12-hour weather forecasts obtained from the United States Weather Service. If unfavorable meteorological conditions are forecasted to persist into the next day, the monitors must be checked at 8:00 A.M. the next day to monitor pollutant levels.

2. Air Alert. The director or his/her designee shall declare that an air pollution alert exists when ambient concentration equals or exceeds the concentration set forth in Section 15.30.060(A)(2). When an air pollution alert is declared, the Anchorage Air Pollution Control Agency shall:

   a. Notify the deputy director or the medical officer, the Commissioner of Public Safety, Municipal Manager, and the Mayor of the affected local governments of the alert and the reasons why the alert was declared.

   b. Notify Alaska Department of Environmental Conservation and the United States

Environmental Protection Agency by telephone.

c. Notify the news media of the alert by issuing a Health Advisory describing the reason for the alert and advising the public of the restrictions and requests contained in this subparagraph.

d. Prohibit open burning for the duration of the alert.

e. Ask Businesses to reduce incinerator use for the duration of the alert.

3 Air Warning. The director shall declare an air pollution warning exists when ambient concentration equals or exceeds the concentration set forth in Section 15.30.060(A)(3). When an air pollution warning is declared, The Anchorage Air Pollution Control Agency shall:

a. Continue those actions initiated pursuant to the declaration of an air pollution alert.

b. Notify the Environmental Protection Agency, and the Alaska Department of Environmental Conservation of the warning. The director shall assemble a task force to review mitigating measures and prepare to implement mandatory measures should the carbon monoxide levels reach emergency concentrations. The task force shall, if possible, consist of but not be limited to:

the Dire tor, Department of Health and Human Services,

the Deputy Director, Department of Health and Human Services,

the Manager, Environmental Services Division,

the Municipal Manager, Municipality of Anchorage

the Regional Supervisor, Alaska Department of Environmental Conservation the Director, Public Works

the Commissioner, Public Safety

Representative of the U.S. Environmental Protection Agency

The names and current addresses and phone numbers for each member shall be maintained in the episode log required under this subsection and in the Department of Health and Human Services Standard Operating Procedures Manual.

c. Define the boundaries of the high concentration areas by the best available methods.

d. Ask the public to reduce the use of woodstoves and fireplaces when an alternative source of heat is available.

4. Air Emergency. The director or his designee shall declare that an air pollution emergency exists when the ambient concentration equals or exceeds the concentration set forth in Section 15.30.060(A)(4). When an air pollution emergency is declared, the Anchorage Air Pollution Control Agency shall:

a. Take those actions required for alerts and warnings.

b. Ask for assistance from the Environmental Protection Agency emergency response team.

c. Issue an air emergency statement after consultation with the Emergency Task Force described in the preceding paragraphs. This statement shall include a health advisory and requests for voluntary abatement measures as described in the preceding paragraphs of this subsection. The director shall request that the Mayor of the government of the affected area adopt any mandatory emission reduction measures selected by the Emergency Task Force. Mandatory control measures may include, but are not limited to:

i. Excusing nonessential municipal employees from work.

ii. Reducing or curtailing municipal services.

iii. Closing schools.

iv. Closing or limiting the operation of businesses whose operation is not essential to protect the public health and welfare.

v. Regulating the flow of traffic and use of motor vehicles except that necessary to protect the public health and welfare.

vi. Banning the use of incinerators.

vii. Banning open burning.

viii. Prohibiting the use of fireplaces or woodstoves except when they are the only source of heating.

ix. Prohibiting parking downtown.

x. Prohibiting or limiting the use of taxicabs or nonessential fleet vehicles.

xi. Elimination of bus fares.

5. Termination of Air Pollution Episodes. Once reached, an air pollution episode level will remain in effect until the criteria for that level no longer exist. At that time, the next lower rating will be automatically declared until such time as the concentrations are lower than alert level.

Section 4. Anchorage Municipal Code subsection 15.30.060 is amended to include a new subsection C to read as follows:

C. Specific measures to be implemented during a carbon monoxide episode. These measures will be implemented in addition to the general episode plan contained in subsection B above.

1. Carbon Monoxide Air Alert.

a. Reassess the status of the alert level at 7:30 A.M. and before 5:00 P.M. each day until alert is terminated.

b. Ask the public to eliminate unnecessary vehicle idling and driving for the duration of the alert.

c. Ask persons operating motor vehicle fleets to voluntarily reduce vehicle activity for the duration of the alert.

2. Carbon Monoxide Air Warning.

a. Request that the Anchorage Police Department increase enforcement efforts of AMC 9.36.010 (unattended motor vehicles).

b. Ask employers and employees to carpool or to use the transit system.

c. Request that member governments use any emergency power necessary to reduce or eliminate bus fares.

PASSED AND APPROVED by the Anchorage Municipal Assembly,

this 9th day of September, 1986.

David J Walker
Chairman

ATTEST:

Ruby E. Smith
Municipal Clerk

## C. FAIRBANKS TRANSPORTATION CONTROL PROGRAM

Detailed information on all aspects of the air quality plan are contained in Volume II, Fairbanks North Star Borough Air Quality Attainment Plan, 1982 and the I/M Program Design Document. These volumes are incorporated into this SIP by reference. They are available for inspection at the Fairbanks North Star Borough offices and at the Juneau ADEC offices.

### 1. Planning Process

#### Interagency Coordination

The Fairbanks North Star Borough has areawide planning responsibilities for the entire borough and has, therefore, been designated as the lead agency by the governor in accordance with the Clean Air Act. As lead agency, the Borough has the responsibility for attaining the carbon monoxide standards by 1987 in Fairbanks and North Pole.

Additionally, the Fairbanks Metropolitan Area Transportation Study (FMATS) Policy Committee was established and supervises preparation of the air quality plan for the Fairbanks area. This committee is made up of the following individuals:

- Fairbanks North Star Borough Mayor
- City of Fairbanks Mayor
- Commissioner, Alaska Department of Transportation and Public Facilities
- Commissioner, Alaska Department of Environmental Conservation
- Presiding Officer, Fairbanks North Star Borough Assembly
- City Manager, City of Fairbanks

#### Citizen Participation Program

The Clean Air Act Amendments of 1977 require that there be adequate public participation during all stages of plan development. Accordingly, the Fairbanks North Star Borough has sponsored a series of public meetings and hearings in order to keep the public informed about the status of this planning process and to receive appropriate public comment. Copies of all public comment received at these meetings, along with copies of newspaper advertisements and articles concerning the attainment planning process, are available from the Borough.

## Speakers Bureau

A speakers bureau was also arranged to provide talks on the air quality situation and the planning process. Over fifty talks involving air quality issues are given per year to various school classes around the Fairbanks area. These classes range from elementary school on up through the college level. In addition to these talks, other presentations on the air quality planning process were given to various civic groups and clubs.

## Fairbanks North Star Borough Organization and Authority

The Fairbanks North Star Borough has operated a local air pollution control program since 1972 through its Environmental Services Department. The program is entirely funded by the $2 per capita state revenue sharing funds for having an air or water pollution control program (70%), and a continuing federal program grant from the U.S. EPA.

Much of the early efforts were concerned with establishing an ambient air monitoring network and enforcing its regulations concerning open burning, visible emissions and dust control. The Environmental Services Department's air quality efforts have become increasingly centered on air quality planning and finding ways to reduce carbon monoxide ambient concentrations. The Borough has relied on the State to control large stationary emission sources within the Borough.

The legal authority for establishing local air pollution control programs is found in Alaska Statutes 46.03.210 LOCAL AIR POLLUTION CONTROL PROGRAMS. The Fairbanks North Star Borough's air pollution control regulations cover open burning, visible emissions from stationary sources, and emergency procedures. These regulations have not undergone any major revisions in the past several years.

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The legal authority for establishing local air pollution control programs is found in Alaska Statutes 46.03.210 LOCAL AIR POLLUTION CONTROL PROGRAMS. The Fairbanks North Star Borough's air pollution control regulations cover open burning, visible emissions from stationary sources, and emergency procedures. These regulations have not undergone any major revisions in the past several years.

2. Nonattainment Boundaries

As required under the 1977 Clean Air Act Amendments that portion of the Fairbanks North Star Borough which has shown past violations of the National Ambient Air Quality Standard for carbon monoxide has been designated as being in nonattainment of the carbon monoxide standard. Boundaries for the nonattainment area have been established (Figure C.2-a). These boundaries are subject to change as more air quality data is collected from the Fairbanks area. Presently most of the Fairbanks and North Pole urban areas and the Fort Wainwright military post are included in the nonattainment area. The legal description of the nonattainment area is as follows:

> Township 1 South, Range 1 West, Section 2 through 23, plus the portion of Section 1 west of the Fort Wainwright military reservation boundary and the portions of Section 24 north of the Old Richardson Highway, and west of the military reservation boundary to the south of the Old Richardson Highway. Also, Township 1 South, Range 2 West, Sections 13 and 24, plus the portions of Sections 14 and 23 which lay southwest of the Chena River. Also, Township 1 South, Range 1 East, Sections 2, 8 and 18, plus the portion of Section 19 which is north of the New Richardson Highway (Fairbanks and Fort Wainwright).
>
> Township 2 South, Range 2 East, those portions of Sections 9 and 10 which lay south~~east~~west of the New Richardson Highway (North Pole).

The air quality planning area can be different from the actual nonattainment area. For the purposes of obtaining a more accurate emission inventory for the area, the boundaries were adjusted slightly to coincide with existing transportation planning boundaries. This greatly reduced the work necessary to quantify vehicle emissions from the study area.

Best copy available

Fairbanks North Star Borough

809 Pioneer Road · P.O. Box 1267 · Fairbanks, Alaska 99707 · 907/452-4761

February 4, 1991

Mr. John A. Sandor
Commissioner
State of Alaska
Department of Environmental Conservation
P.O. Box O
Juneau, Alaska 99811-1800

Dear Commissioner Sandor:

My staff have reviewed the boundaries of the Fairbanks carbon monoxide non-attainment area in light of recent monitoring data, traffic data and the requirements of the 1990 Clean Air Act requirements. We have determined that the boundaries of the area should remain unchanged. Enclosed for your use in the State Implementation Plan is the legal description and map of the area. If there are any questions regarding this matter, please contact Kelly McMullen, Environmental Services Manager.

Sincerely,

Richard L. Cleaver
for

Juanita Helms
Borough Mayor

JH/kam

Enclosures

Fbks

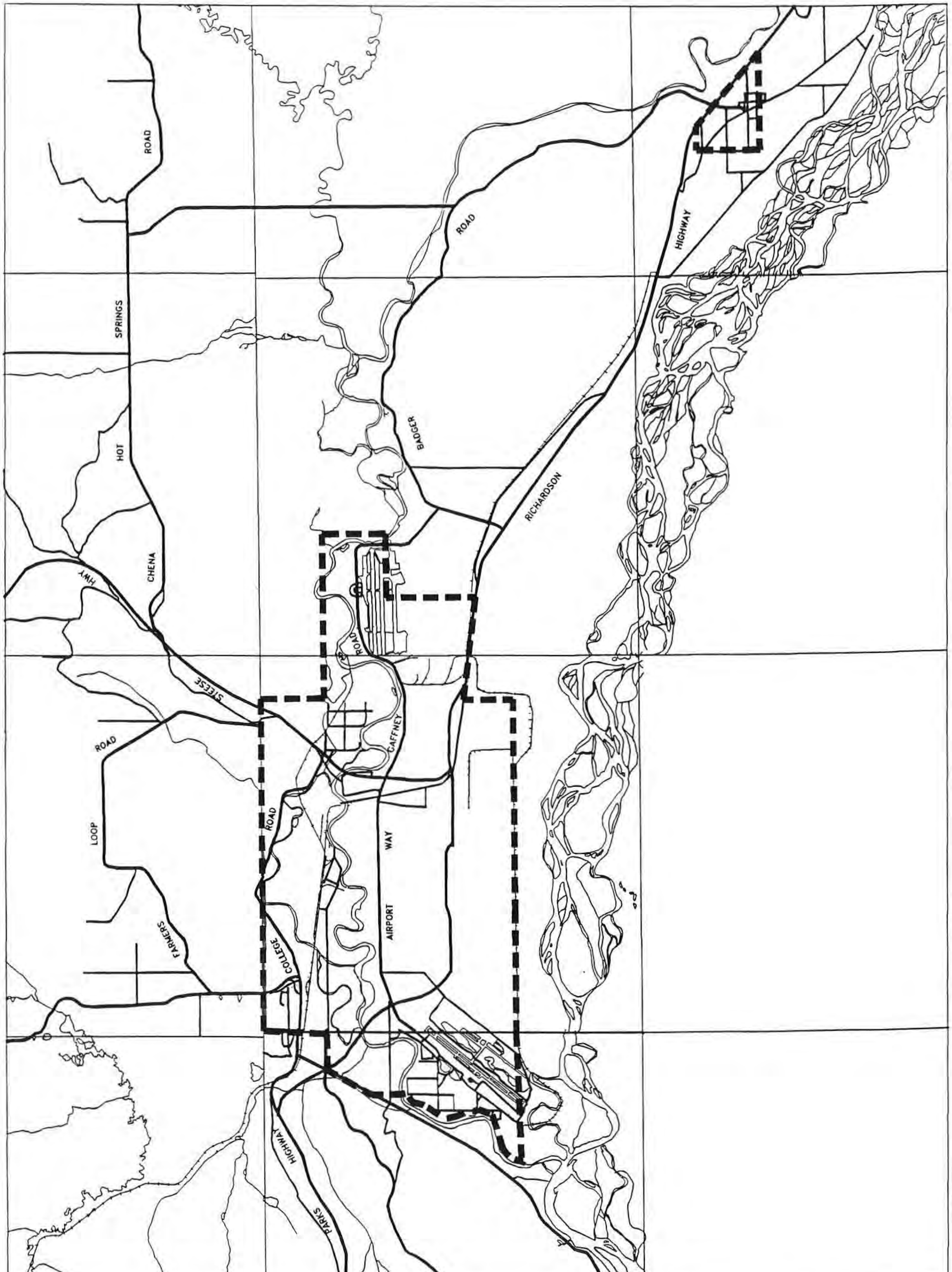
FAIRBANKS NON-ATTAINMENT AREA BOUNDARIES

1. Township 1 South, Range 1 West, Sections 2 through 23, the portion of Section 1 west of the Fort Wainwright military reservation boundary and the portions of Section 24 north of the Old Richardson Highway and west of the military reservation boundary. Also,. Township 1 South, Range 2 West, Sections 13 and 24, the portion of Section 12 southwest of Chena Pump Road and the portions of Sections 14 and 23 southeast of the Chena river. Also, Township 1 South, Range 1 East, Sections 7, 8 and 18 and the portion of Section 19 north of the Richardson Highway. (Fairbanks and Ft. Wainwright)

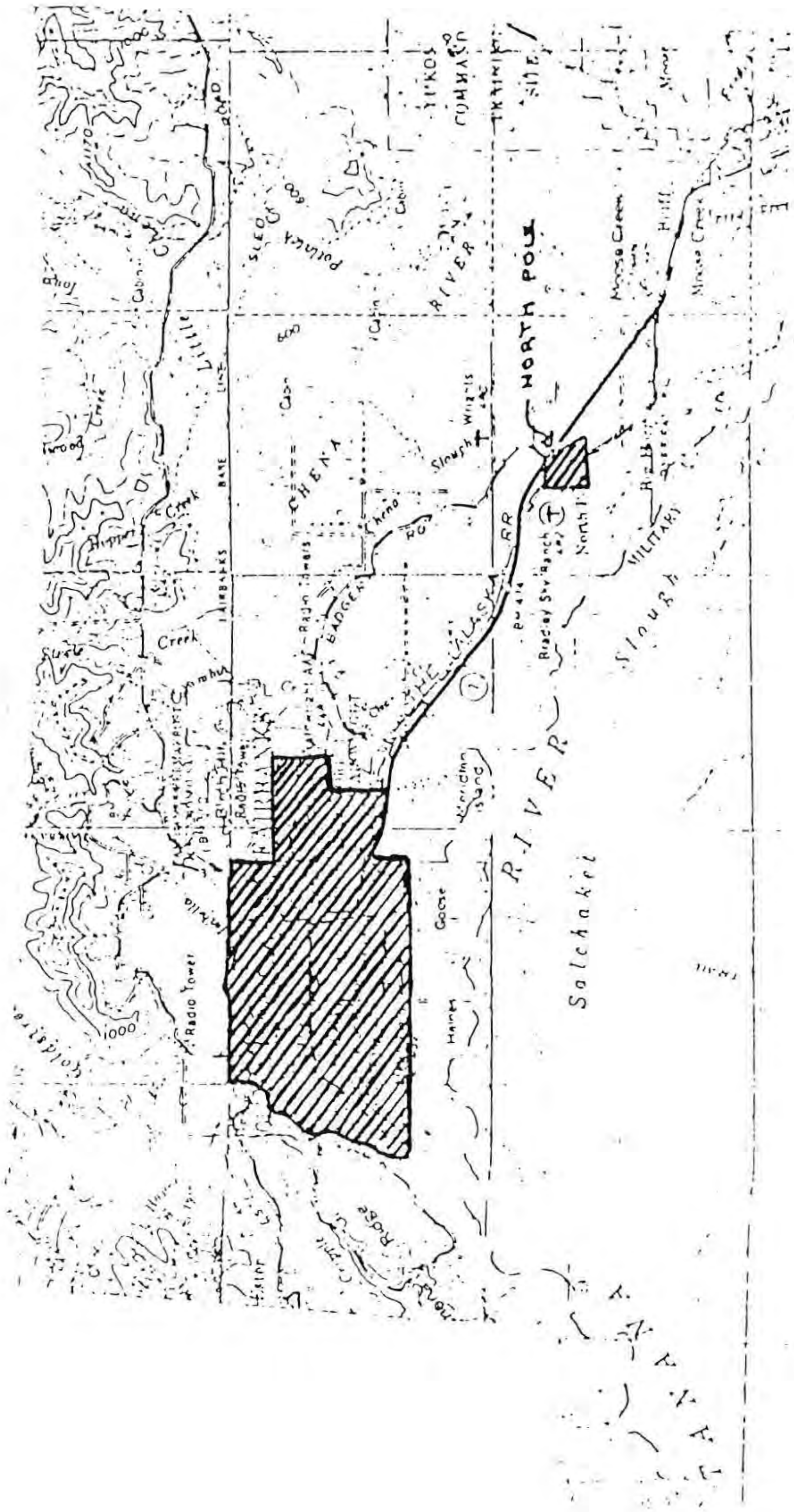
2. Township 2 South, Range 2 East, the portions of Sections 9 and 10 southwest of the Richardson Highway. (North Pole)

Corrected description

2/4/91



ROAD
SPRINGS
HOT
CHENA
HWY
STEESE
ROAD
LOOP
FARMERS
ROAD
COLLEGE
GAFFNEY
ROAD
AIRPORT
WAY
BADGER
ROAD
RICHARDSON
HIGHWAY
HIGHWAY
PARKS




Scale: 1" = 4 miles

Figure C.2-a Fairbanks Nonattainment Boundaries

3. Air Quality Emissions Data

Emissions Inventory

A comprehensive emission inventory for the 1980 SIP submission was prepared for the study area and is available at the Borough or DEC. It is contained in the Fairbanks North Star Borough Air Quality Attainment Plan, Volume II, 1982. This inventory consists of two parts; a point source inventory and an area source inventory. The seasonal climatic variations result in large changes in monthly carbon monoxide emissions. Therefore, it is necessary to document these emissions for each month rather than on just an annual basis. The inventory contains a monthly listing.

Emissions from all point sources were calculated by multiplying the monthly fuel usages by the appropriate emission factors (obtained from EPA's AP-42 handbook). Area source emissions come from three principal sources; motor vehicles operations, aircraft operations, and business and residential heating fuel consumption. Motor vehicle emissions can be separated into three categories; start-up emissions, parking lot emissions, and stable-mode trip emissions.

A computerized traffic model operated by the Alaska Department of Transportation and Public Facilities was utilized to generate total vehicle mileage counts for all roadway segments throughout the nonattainment area. Vehicle miles traveled (VMT) figures were then calculated for each FMAT zone. These figures were then multiplied by the appropriate emission factors to obtain stable mode automobile originals from each FMAT zone. These data were used to calculate automobile start-up emissions and parking lot emissions. Emissions from aircraft operations were calculated by multiplying landing-takeoff (LTO) cycles obtained from the Fairbanks International Airport and the Fort Wainwright Military Airfield by appropriate emission factors contained in AP-42. Business and residential heating fuel consists of three primary types; fuel oil, coal, and wood. Emissions from the combustion of all three types of fuel were calculated similarly; an estimate of the actual fuel burned in each of the FMATS zones was multiplied by the appropriate emission factor. Table C.3-a shows the contribution of each type of source to the total emission burden for the entire nonattainment area.

The city of Fairbanks was established in the early 1900s as a trading post serving gold prospectors in the area. During the first part of this century the population peaked and waned according to the price and availability of gold. During the 1940s the Alaska Highway was completed and this, plus increased military activity in the area due to World War II, combined to cause considerable growth.

Continued military spending and increasing governmental growth resulted in more economic activity and population growth in the 1950s. By 1960 the population of the Fairbanks Census District had grown to 43,412. In the 1960s the military influence in the Fairbanks area leveled off while increased oil exploration in Northern Alaska accounted for a 15% increase in the population during the decade. During the 1970s the construction of the trans-Alaska oil pipeline resulted in a large population influx into this area which peaked in 1976 at 81,073. With completion of the pipeline the population fell dramatically to 62,064 by 1979.

Table C.3-a

1979 Areawide CO Emissions

| Source Type | | | |
|---|---|---|---|
| POINT SOURCES | | 182 | 0.3% |
| Vehicle Start-up | 22406 | | 40.7 |
| Vehicle Parking Lot Activity | 17387 | | 31.5 |
| Vehicle Travel | 13043 | | 23.7 |
| Vehicle Operation Subtotal | | 52837 | 95.9 |
| Aircraft Fuels | | 1006 | 1.8 |
| Fuel Oil Combustion | 57 | | 0.1 |
| Coal Combustion | 23 | | 0.1 |
| Wood Combustion | 1012 | | 1.8 |
| Heating Fuels Subtotal | | 1092 | 2.0 |
| AREA SOURCES | | 54935 | 99.7 |
| TOTAL EMISSIONS | | 55117 | 100.0% |

The potential construction of the natural gas pipeline through the Fairbanks North Star Borough will have a significant impact on population growth within the nonattainment area. Because of the uncertainty of a construction date for the pipeline it is difficult to accurately assess that impact. In their population projection ADOT & PF assumed that the construction of the pipeline will begin in 1981 and be completed by 1983. Northwest Pipeline Company estimates that a labor force of 7000 will be employed during the peak construction period. For every temporary construction job it is estimated that 0.34 permanent positions will be created in the Fairbanks area. Additionally the pipeline will create a permanent work force of 650. Each of these permanent pipeline jobs is estimated to create an additional 0.5 positions. Adding these permanent positions to the base population for 1987 gives a revised 1987 population of 50,389 within the FMATS study area.

Additional assumptions which affect population projections within the nonattainment area include:

° Other than the gas pipeline construction only moderate activity will take place in oil, gas and agricultural development in this area during the forecast period.

° The military population will remain unchanged during this period.

° The impact of the University of Alaska will increase in direct proportion to the Fairbanks population.

° Any state or local government land disposal programs will have no effect on the population within the study area.

If any of these assumptions are proven invalid at a later date the growth rate of this area would change. These assumptions represent ADOT & PF's best estimate at this time; however, they are revising them based on the latest Northwest Gas Pipeline projections.

At present there are no 201 or 208 water quality programs within this area so no consistency determination was required between population projections used in those programs and the estimates used herein.

Although there was a significant decrease in population from 1976 to 1980 it appears that vehicle miles traveled within the non-attainment area did not decrease correspondingly. An analysis by ADOT & PF showed that monthly traffic volumes across the Chena River Screenline have remained fairly constant over the same period. Since approximately 1/3 of all trips made within the nonattainment area cross this screenline these monthly volumes should be an excellent indicator of total miles traveled.

In addition to the decrease in population during this time period there was a dramatic increase in gasoline prices and the local transit system showed a five-fold increase in ridership. It is therefore surprising that traffic volumes remained constant.

ADOT & PF completed a land use inventory in 1978. This inventory was used to project future years population by use of housing density figures and vacancy rates. A civilian population projection of 36,377 for the entire FMATS study area for 1978 was obtained by this means. This projection was compared to two other independent population estimates and agreed within 2.5% of both figures.

The historical growth rates from 1970 to 1978 for various sectors of the Borough include rates of 3.78% for the entire Borough, 3.0% for the FMATS study area, and 1.67% for the City of Fairbanks. Averaging these rates give an annual growth rate of 2.8%. This is the figure that was used by ADOT & PF to represent future annual growth within the FMATS area excluding external factors such as the gas pipeline construction. Using this growth rate the base population for 1987 is projected to be 46,641.

Emission Reduction Target

The 1979 emissions inventory showed an annual areawide total of 55,117 tons of carbon monoxide. Therefore, in order to reach attainment emissions would have to be reduced to 55,117 x (1.0 - 0.452) = 30,204 tons. Projected 1987 emissions are 38,226 tons so 8,022 additional tons of CO must be eliminated to attain the 9ppm standard. This is equivalent to an 21.0 percent reduction in projected 1987 emissions. Therefore, 21.0 percent is the figure used as the design value for this attainment plan.

4. Carbon Monoxide Monitoring Network Plan

A critical part of the entire attainment process is the establishment of a feedback mechanism to monitor the success of the attainment plan. Progress toward attainment will be monitored in three primary areas; ambient CO concentrations, surveillance data from in-use vehicles, and I/M program effectiveness.

Ambient carbon monoxide data will continue to be collected at three sites; 2nd and Cushman (SAROAD SITE IDENTIFICATION NO. 020160002G01) and 7th and Cushman (SAROAD SITE NO. 020160013G01) downtown and at Hunter School (SAROAD SITE NO. 020160020G01) in a residential area. This data will be compared to the expected reductions in CO concentrations to determine progress in ambient reductions.

Because of the uncertainties in projections of emissions from future-year vehicle fleets, there is a strong possibility that the 1987 emission levels may be overpredicted. Therefore, a system will be set up to obtain EPA surveillance data on in-use vehicles and an attempt made to use such data to update the 1987 projections on a yearly basis.

The data generated at the inspection facilities in the I/M program will be collected, and program effectiveness will be calculated using these data.

## 5. Transportation Control Strategies

The Clean Air Act contains a list of nineteen strategies which nonattainment areas are required to consider for inclusion in their air quality attainment plan. These strategies, along with some developed locally, were examined for their applicability to the Fairbanks problem. After initial rejection of the grossly unsuitable strategies it was decided to perform an in-depth analysis on the following strategies.

- Transportation system management plan
- Transit plan
- Parking management plan
- Electric preheater usage at warmer temperatures
- Automatic starting devices
- Carpooling program
- Inspection and Maintenance (I/M) program
- Low temperature automotive emissions standard
- Idling restrictions
- Gasohol and other alternative fuels
- Restricted delivery hours
- "Do Nothing"

The following strategies were initially rejected.

- Bus preemptions of traffic signals
- Traffic flow changes during certain time of day.
- Light rail transit
- Fringe parking (park and ride)
- Heavy-duty vehicle restrictions
- Selective vehicle entry
- Vapor recovery
- Bicycle lanes and storage facilities

The urban population of the Fairbanks area is less than 50,000 people. We are dealing with a small city that has a big city problem; i.e. high ambient carbon monoxide concentrations during the winter months. Therefore, some of the big city strategies just are not practical in Fairbanks and would have very small air quality benefits. Strategies rejected for these reasons included the bus preemption of traffic signals, the traffic flow changes during the day, light rail transit and fringe parking (park and ride). In addition, both the light rail transit and the park and ride strategies would be extremely costly to implement.

Since most of the carbon monoxide problem in Fairbanks is due to cold-start automobile emissions (they account for more than sixty percent of the wintertime CO emissions), strategies which only reduce the warm idle emissions would have very small air quality benefits. The fringe parking strategy would also fall in this category.

Heavy-duty vehicle restrictions were rejected since the current truck routes and the resticted delivery times strategy under review will achieve the same effect. Selective vehicle entry will be considered as a component of a vehicle-free zone strategy.

Vapor recovery strategies pertain only to areas with a hydrocarbon pollution problem. Therefore this strategy was rejected for the Fairbanks carbon monoxide attainment plan. Additionally bicycle lanes and storage facilities were rejected as a strategy because the use of bicycles is not feasible during the period of the year when Fairbanks experiences violations of the carbon monoxide standard, i.e. in the wintertime.

Upon completion of the analysis of the individual control measures five strategy packages were developed. These packages contain the following individual control measures, respectively.

| Package 1 | Package 2 | Package 3 |
|---|---|---|
| Transit | Transit | Transit |
| Parking Management | Parking Management | Parking Management |
| Electric Preheaters | Carpools | Electric Preheaters |
| Carpools | I/M | Carpools |
| I/M | Idling Restrictions | I/M |
| Idling Restrictions | Gasohol | Idling Restrictions |
| Restricted Delivery Hours | Restricted Delivery Hours | Gasohol |
| | | Restricted Delivery Hours |

| Package 4 | Package 5 |
|---|---|
| Electric Preheaters | Transit |
| Gasohol | Parking Management |
| | Electric Preheaters |
| | Gasohol |

These packages were then analyzed for cost, transportation, energy usage, air quality, institutional, and socio-economic impacts. These analyses are available at the Borough and DEC. Package 1 does not result in nearly enough reduction to reach attainment so it has been rejected. An analysis of the costs of the other packages show that the annual cost for these packages would range from 3.3 to 3.9 million dollars per year.

CO reductions are estimated to be 20.8 % for Package 2, 25.0% for Package 3, 19.9 % for Package 4, and 20.0% for Package 5. These estimates assume no reduction in cold-start emissions due to an I/M program. This assumption was made because the results of the State of Alaska's METFac research program on I/M effectiveness was unknown and 0% effectiveness represented the most conservative estimate.

Because of the uncertainty over I/M effectiveness, it was also decided to analyze a package consisting solely of an I/M strategy. This package would have an annual cost of approximately $535,000 per year and a selected stringency factor adjusted to attain the design value of 21.0%. The results of the METFac study program do show that an I/M program could achieve an overall emissions reduction of at least 21%, depending on the stringency factor chosen. Therefore, this package is a viable alternative to the other packages.

The cost analysis shows a wide disparity between Package 6 (I/M program only) and the other packages. Although no definition exists, to our knowledge, of what is considered reasonable (in terms of "reasonably available control measures"), it is felt that excessive cost is one measure of unreasonableness. For this reason the mandatory control measures, other than an I/M program, are rejected as unreasonable. This is especially true since the presently available data shows that the Fairbanks area will attain the standard if an I/M program is the only mandatory strategy implemented.

However, it should be pointed out that the I/M program will not be the only effort aimed at reducing areawide CO concentrations. Other measures are currently underway to help reduce such emissions. The Borough transit system will continue to be operated, and expanded as needed. The City of Fairbanks and the State of Alaska have instituted a number of traffic flow improvements over the past few years, and will continue to do so. The 1987 emission projections assume that by that date two major highway projects will be constructed within the current nonattainment area. These projects, the 30th Avenue Expressway and the Geist Road Extension, are designed to relieve the present and projected traffic congestion problems on the two major east-west routes currently in service within this area. Because these projects will improve traffic flow they should not worsen carbon monoxide levels within the nonattainment area and may lead to an improvement in air quality.

Additionally, the City of Fairbanks is continuing work on a district heating system which will reduce CO emissions from residential heating. Such a system will significantly retard the trend toward residential wood combustion (RWC) in the Fairbanks area and could therefore result in a substantial reduction in CO from residential heating sources.

The Borough will also continue an extensive effort to reduce cold-start CO emissions by preheating vehicles at warmer temperatures. As part of this program, the Borough will begin to turn on its electrical receptacles at +20°F and will actively seek to have all other government agencies in the Fairbanks area to do likewise. This effort will be accompanied by a significant public eduction program to get people to voluntarily plug-in beginning at +20°F.

Basic Transportation Needs

This attainment plan will not restrict the mobility of the people of the Fairbanks area. In order to insure that there is no interference with mobility, the Borough's transit system will continue to be operated to provide an alternative mode of transportation to anyone wishing to use the system. The system is currently underutilized and has ample room for significant increases in ridership. The Borough is committed to continued funding of the transit system to provide such an alternative to other modes of transportation.

I/M Program Design

Under the I/M Program, owners of model year 1975 and newer cars and trucks are required to have their vehicles inspected for emissions problems each year, or upon initial registration in the State. The model year of vehicles subject to the program changes over time because inspections are not required for vehicles that are more than fifteen years old. Vehicles determined to have excessive pollution levels are required to be repaired prior to renewal of registration by the Alaska Division of Motor Vehicles (DMV).

Two types of waivers from the program requirements are available. All diesel powered vehicles can obtain a waiver from the Program Administration office and a vehicle which is not operated in the Fairbanks North Star Borough from November 1 through March 31 can receive a seasonal waiver if the owner agrees not to operate that vehicle within the Borough during that time period.

Inspections required under the I/M Program must be made at a Certified I/M Station, except under special circumstances. A fee may be charged for the inspections, and vehicles which fail the inspection because of defects in their emission control system must be repaired and then retested by a Certified I/M Station. All inspections shall be conducted only by Certified I/M Mechanics in accordance with the procedures contained in the I/M Program Design Document. The total fee charged the owner for the inspection shall not exceed $35, including the cost of a Certificate of Inspection.

All vehicles inspected at a Certified I/M Station shall be issued a Vehicle Inspection Report indicating whether the vehicle passed or failed. Vehicles which meet the inspection standards specified in section 8 or which qualify for a waiver under section 2.3.1 shall be issued a Certificate of Inspection.

Vehicles which fail the inspection or are rejected because of safety defects which prevent the vehicle from being safely tested shall require repairs and reinspection prior to the issuance of a Certificate of Inspection.

Repairs required under the I/M Program may be performed by anyone, including vehicle owners. However, incentives are provided for the repair of vehicles by Certified I/M Mechanics working at Certified I/M Stations. Except for certain Fleet Operator owned vehicles, vehicle owners are guaranteed of either passing the retest or receiving a waiver if they have repairs performed at a Certified I/M Station. In addition, there is a ceiling on the cost of repairs required for all work done by Certified I/M Stations (except for vehicles owned by Fleet Operators who also own or operate Certified I/M Stations). Work done or parts purchased and installed by vehicle owners or at uncertified facilities will not count toward this cost ceiling.

Emission repairs performed at Certified I/M Stations are required to be performed in accordance with the procedures specified in the design document. Except for certain Fleet Operator owned vehicles, repairs shall be performed until the next increment of repair work would cause the total cost of emissions repairs to exceed the Repair Cost Ceiling as outlined below. Additional repair work is voluntary except for vehicles owned by Fleet Operators who also own or operate Certified I/M Stations.

Emissions Repairs which would cause the Repair Cost Ceiling to be exceeded are not required if repairs are done at Certified I/M Stations, except that there is no Repair Cost Ceiling for vehicles owned by Fleet Operators who also own or operate Certified I/M Stations. The Repair Cost Ceiling for Emissions Repairs done to 1985 and older model year vehicles which are not owned by Fleet Operators who also own or operate Certified I/M Stations shall be as follows:

<u>From July 1, 1985 to December 31, 1985:</u> $150 for the correction of all emissions related defects.

<u>From January 1, 1986 to December 31, 1986:</u> $300 for the correction of all emissions related defects but not more than $150 for the correction of defects which are not the result of using leaded gasoline in vehicles originally equipped with catalytic converters or disconnection, removal, modification, or other tampering with emission control systems or components which affect exhaust emissions.

<u>After December 31, 1986:</u> $500 for the correction of all emissions related defects, but not more than $150 for the correction of defects which are not the result of using leaded gasoline in vehicles originally equipped with catalytic converters or disconnection, removal, modification, or other tampering with emission control systems or components which affect exhaust emissions.

For 1986 and newer model year vehicles the repair cost ceiling is $150 for the correction of defects which are not the result of using leaded gasoline in vehicles originally equipped with catalytic converters or disconnection, removal, modification, or other tampering with emission control systems or components which affect exhaust emissions. There is no repair cost ceiling for other defects.

All failed vehicles, and vehicles which are rejected from testing because of safety defects, must be reinspected after repairs are performed. Except for certain Fleet Operator owned vehicles, vehicles which pass the reinspection or which fail the reinspection after having repairs performed at a Certified I/M Station shall be issued a Certificate of Inspection. Vehicles owned by a Fleet Operator who also owns or operates a Certified I/M Station shall require all repairs necessary to pass the reinspection. A fee may be charged for each reinspection when repairs are performed at a facility different from the facility which performed the initial inspection.

The Program Administration Office will maintain and operate a vehicle test facility which shall be used to assist in the resolution of disputes between motorists and Certified I/M Stations. The facility will be equipped with instrumentation and other equipment and supplies necessary to determine whether a vehicle passes or fails an inspection test performed in accordance with section 7. Motorists may call to make appointments for tests at the Referee Facility. Tests will be performed without appointment on a time available basis.

The Referee Facility will also be used to inspect Diesel vehicles and vehicles which have been rejected from testing at Certified I/M Stations because of engine or fuel changes, or other problems. The Referee Facility may issue Certificates of Inspection for vehicles with modified engine or fuel systems if they meet the requirements outlined in the design document. Private auto repair facilties will be certified as "Certified I/M Stations" by the Program Administration Office if they have the proper tools and Test Analyzer System (TAS) to perform the inspection and they use only certified I/M Mechanics to perform inspections and emission repairs in accordance with the procedures specified in the design document. Auto mechanics can become certified by either successful completion of a 40 hour certified mechanics training course or passage of a challenge test and a 8-hour course on program-specific information.

The Test Analyzer Systems to be used in the program must meet BAR-84 specifications with specified Alaskan modifications. These analyzers, which utilize tamper-proof storage of all inspection data on cassette tape, will provide excellent quality control and consumer protection, as well as furnishing an excellent data base for compilation of statistics regarding program effectiveness and adequacy.

Enforcement of the program will be through the Alaska Division of Motor Vehicle's vehicle registration program. All eligible vehicles will be required to have either Certificates of Inspection or waivers prior to reissuance of registration. For those vehicles which are covered by a seasonal waiver, DMV will issue a specially colored license plate tab. It will be illegal to drive a vehicle displaying the seasonal tab during the period of November 1 through March 31. Enforcement of this will be handled by a City of Fairbanks "meter maid" who will patrol the downtown area during the winter months, and by City and State Police during routine stops of motor vehicles.

Inspection standards will consist of visual and functional checks as well as exhaust emission standards. 1975 and later model year vehicles for which emissions inspections are specified must be visually inspected to determine whether vehicles which were originally factory-equipped with the following components and these components are properly installed and unmodified:

1. air injection system
2. catalytic converter
3. vacuum hoses and wiring
4. carburetor or fuel injection
5. exhaust and intake manifolds
6. ignition system
7. positive crankcase ventilation (PCV) system
8. intake air heating system

Any vehicle on which one or more of these systems is disconnected, modified, or missing, will fail the inspection. However, any vacuum hose defects will not result in failure of the inspection if the defects only involve the plugging, or disconection and plugging, of vacuum lines which control EGR or evaporative emission control devices.

Functional tests shall also be performed for PCV and air injection system operation. Hoses and wires shall be functinally checked for hose cracks or breaks, and bare wires. Vehicles shall also be inspected for dashboard indicator lights which indicate the need for emission control system maintenance. Vehicle with such lights illuminated shall fail the visual inspection unless the lights indicate a scheduled exhaust gas recirculation system maintenance or scheduled catalyst replacement.

Vehicles originally equipped with catalytic converters shall also be tested for leaded fuel use using a plumbtesmo test. Vehicles determined to have used leaded fuel shall fail the inspection.

Passenger cars and trucks below 6000 GVW (generally 1/2-ton and smaller pickup trucks, vans (except step-vans), van conversions, and utility vehicles) shall fail if carbon monoxide emissions exceed the following levels at either idle or 2500 rpm:

Percent Carbon Monoxide

| Model Year | no CAT | w/Air | OX Catalyst no Air | 3-way |
|---|---|---|---|---|
| '75 - '83 | 3.0 | 1.5 | 4.5 | 1.0 |
| Post - '83 | ------------------------1.0------------------------ | | | |

Light-duty trucks 6000 too 85000 pounds (generally 3/4-ton pickups, small step vans, funeral coaches, airport limousines, ambulance vans) shall fail if carbon monoxide levels exceed the following levels at either idle or 2500 rpm:

Percent Carbon Monoxide

| Model Year | --- '78 and Older Models --- | | | | --- '79 and Newer Models --- | | | |
|---|---|---|---|---|---|---|---|---|
| | >4 cylinders | | 4 cylinders | | | OX Catalyst | | |
| | w/Air | no Air | w/Air | no Air | no CAT | w/Air | no Air | 3-Way |
| '73-'78 | 3.0 | 6.0 | 4.5 | 6.0 | | | | |
| '79-'83 | | | | | 3.0 | 1.5 | 4.5 | 1.0 |
| Post-'83 | | | | | ----------1.0---------- | | | |

Heavy Duty Trucks (>8500 GVW), Buses and Motor Homes shall fail if carbon monoxide levels exceed the following levels at either idle or 2500 rpm:

| Model Year | CO% |
|---|---|
| 1974-1978 gasoline | 4.0% |
| Post-1978 gasoline | 3.0% |

6. Reasonable Further Progress

The concept of Reasonable Further Progress (RFP) is intended to insure that a nonattainment area will begin reducing pollutant levels immediately after plan adoption and will continue to do so until attainment is reached. Therefore, RFP requires nonattainment areas to achieve a per year reduction at least equal to the reduction attained by drawing a straight line from the base year concentration to the 9 ppm concentration in 1987. For Fairbanks, the required straight line reduction is shown in Table C.6-a. This table also shows the reductions in CO emissions (in tons/year) required to achieve attainment. Table C.6-b shows the expected yearly reductions resulting from both the I/M strategy and the lower emissions from future model year vehicles.

Progress is continuing toward implementation of the I/M program within the Fairbanks North Star Borough beginning July 1, 1985. The Borough Assembly has passed Ordinance 84-24, which adopts and implements a mandatory I/M program, and Resolution 84-39, which approves the final program design of the I/M program. Staff for the I/M program have been hired and certification of mechanics and inspection stations is proceeding.

Table C.6-a REASONABLE FURTHER PROGRESS-REQUIRED REDUCTIONS

| YEAR | CONCENTRATION | EMISSIONS |
|---|---|---|
| 1979 | 15.6 | 55,117 |
| 1980 | 14.8 | 52,002 |
| 1981 | 13.9 | 48,888 |
| 1982 | 13.1 | 45,773 |
| 1983 | 12.3 | 42,659 |
| 1984 | 11.5 | 39,545 |
| 1985 | 10.6 | 36,430 |
| 1986 | 9.8 | 33,315 |
| 1987 | 9.0 | 30,201 |

*Second highest eight-hour average

Table C.6-b EXPECTED REDUCTION

| YEAR | I/M PROGRAM | ANNUAL EMISSIONS (TONS OF CO) | SECOND-HIGHEST CONCENTRATION |
|---|---|---|---|
| 1979 | NONE | 55,117 | 15.6[1] |
| 1980 | NONE | 53,758 | 16.0[1] |
| 1981 | NONE | 52,405 | 14.9[1] |
| 1982 | NONE | 49,966 | 14.3 |
| 1983 | NONE | 47,168 | 13.6 |
| 1984 | PART OF YEAR | 44,703 | 13.0 |
| 1985 | FULL PROGRAM | 34,093 | 9.9 |
| 1986 | FULL PROGRAM | 31,819 | 9.4 |
| 1987 | FULL PROGRAM | 29,865 | 8.9 |

[1] Actual measured concentration

By: B. B. Allen
Jerry Norum
Paul Chizmar

Introduced: 04/28/83
Amended: 05/02/83
Adopted: 05/02/83

RESOLUTION NO. 83-19

A RESOLUTION AUTHORIZING THE DEVELOPMENT OF
A VEHICLE EMISSIONS INSPECTION AND MAINTENANCE PROGRAM
FOR THE FAIRBANKS NORTH STAR BOROUGH

WHEREAS, the Clean Air Act requires that the National Ambient Air Quality Standards be attained by 1987, at the latest; and

WHEREAS, the National Ambient Air Quality Standard for carbon monoxide is designed to protect susceptible members of the general population from harmful health effects of carbon monoxide; and

WHEREAS, the Fairbanks area exceeds the National Ambient Air Quality Standard for carbon monoxide on occasion; and

WHEREAS, the Fairbanks Air Quality Attainment Plan has been presented to the Fairbanks North Star Borough Assembly; and

WHEREAS, a mandatory Vehicle Emissions Inspection and Maintenance (I/M) program has been identified in Alaska's State Implementation Plan as the only currently available and economically feasible method to attain the National Ambient Air Quality Standard for carbon monoxide by 1987; and

WHEREAS, legislation authorizing and implementing the selected method for attaining the National Ambient Air Quality Standard must be enacted by July, 1 1983, or such federal sanctions may be implemented; and

WHEREAS, the State of Alaska, in the past, has indicated a position of responsibility for a portion of the initial capital cost, such as land, building and equipment, initial program start up costs for planning and development technician training and public information:

NOW, THEREFORE, BE IT RESOLVED By the Fairbanks North Star Borough Assembly, that the following actions be recognized and implemented:

1. Recognizing the need for a plan that demonstrates attainment, the concept of a mandatory Inspection and Maintenance (I/M) program is approved.

2. The Borough will be responsible for development, implementation, and management of this program.

3. The Assembly will develop criteria for the program and the administration shall develop a fiscal note that will be forwarded to the State of Alaska.

4. The program shall be developed so as to allow for cancellation in the event that:

   a. another, more desirable, method of attainment is implemented, or

   b. attainment is reached and can be maintained in the absence of this program.

5. The Borough administration will submit an annual report to the Assembly by July 1st of each year which will evaluate the program's effectiveness and the carbon monoxide trends in the Fairbanks area. This report will be accompanied by a recommendation on whether or not to continue the program.

6. The I/M program will be cancelled on December 31, 1988, unless reenacted by the Borough Assembly prior to that date.

7. The implementation of this I/M program shall commence upon receipt of the initial funding from the State of Alaska.

PASSED AND APPROVED THIS 2ND DAY OF MAY, 1983.

Jerome W. Nolan

Presiding Officer

ATTEST:

Clerk of the Assembly

Resolution No. 83-19
Page 2 of 2

| | |
|---|---|
| By: B. B. Allen | |
| Introduced: | 03/03/83 |
| Amended: | 03/03/83 |
| Defeated: | 03/03/83 |
| Reconsidered: | 03/10/83 |
| Amended: | 03/10/83 |
| Adopted: | 03/10/83 |

RESOLUTION NO. 83-11

A RESOLUTION AUTHORIZING THE DEVELOPMENT OF AN AIR QUALITY ATTAINMENT PROGRAM FOR THE FAIRBANKS NORTH STAR BOROUGH

WHEREAS, the Clean Air Act requires that the National Ambient Air Quality Standards be attained by 1987, at the latest; and

WHEREAS, the Clean Air Act further requires the U.S. Environmental Protection Agency and the U.S. Department of Transportation to implement certain federal sanctions against those areas which do not attain those standards by that date; and

WHEREAS, the National Ambient Air Quality Standard for carbon monoxide is designed to protect susceptible members of the general population from harmful health effects of low levels of carbon monoxide; and

WHEREAS, the Fairbanks area exceeds the National Ambient Air Quality Standard for carbon monoxide; and

WHEREAS, the Fairbanks Air Quality Attainment Plan has been presented to the Assembly; and

WHEREAS, legislation authorizing and implementing the selected method for attaining the National Ambient Air Quality Standard must be enacted by July 1, 1983, or such federal sanctions will be implemented.

NOW, THEREFORE, BE IT RESOLVED by the Assembly of the Fairbanks North Star Borough that a committee shall be formed to provide local input into the development and implementation of the plan. This committee will consist of two members of the Borough Assembly appointed by the Presiding Officer; two members of the Borough's Pollution Control Commission to be appointed by the Borough Mayor and confirmed by the Borough Assembly; and three members of the general public, one of which will reside in the City of Fairbanks, one from the City of North Pole and one at large residing in the borough to be appointed by the Borough Mayor and confirmed by the assembly.

PASSED AND APPROVED THIS 10th DAY OF MARCH, 1983

Bruce A. Campbell
Presiding Officer

ATTEST:

Larry J. Patrick
Clerk of the Assembly

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING
JUNE 15, 1983
5:30 PM
ENGINEERING CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
Frank Abegg, Pollution Control Commission
John Hargesheimer, Pollution Control Commission
Ken Brewer
Steve Kailing (for Lee Leonard)

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities

Others:

Jack Cotts

Items of Discussion:

1. Committee Organization

The committee members discussed the selection of a chairperson and decided to postpone such action until the other two members of the committee are appointed and in attendance. Until that time, Donald Moore will serve as chairman.

2. Decision on Centralized/Decentralized I/M Program

It was moved by Frank Abegg, and seconded by John Hargesheimer, that the committee adopt a resolution in favor of a centralized I/M program. Discussion ensued on the relative merits of the two types of programs. Robert Blake stated that he was in favor of a centralized program due to the size of the Fairbanks vehicle fleet. Ken Brewer also indicated a centralized program would be better.

Donald Moore asked the committee members whether they wished to have some proponents of a decentralized program address the committee. After discussion, it was agreed that the staff should invite representatives from the automobile dealerships to the next meeting.

The next meeting was scheduled for Wednesday, June 22nd, at 5:30 pm.

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING

June 22, 1983

NOEL WEIN LIBRARY CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Ken Brewer
Steve Kailing (for Lee Leonard)

Staff Present:

Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Kelly McMullen, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities
Charlie Howard, Federal Highway Administration

Others:

Ralph Seekins, Seekins Ford Lincoln Mercury
Robbie Ginther, Tip Top Chevrolet
John Emmel, Gene's Auto Service
Van Bowman, A & B Auto Sales
Tom Alexander, A & B Auto Sales
John Hill, Auto Service Company
Don Seelinger, Don's Union
Ron McMahan, American Tire Warehouse
Jim Looney, Jim's College Texaco
Richard Entwhistle, Sunshine Rae Motors
Jack Coutts

Items of Discussion:

Representatives of private automobile repair facilities in the Fairbanks area had been invited by the committee to attend the meeting to discuss the option of a centralized/decentralized I/M program. A general discussion ensued between staff, the committee, and these representatives. The concensus of the repair industry is that:

1. They prefer a decentralized program.

2. There is adequate capacity in the existing facilities to conduct a decentralized program.

The next meeting will be held on Wednesday, July 6th, at 5:30 p.m., in the Engineering Conference Room.

cc: Committee Members
Tom Moyer, D.E.C.
John Martin, D.O.T./P.F.
Mayor Allen

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING

JULY 6, 1983

BOROUGH ENGINEERING CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Frank Abegg, Pollution Control Commission
Ken Brewer
Lee Leonard

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities
Kathy Pazera, Environmental Protection Agency/Alaska
Operations Office

Others:

Jack Coutts

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Items of Discussion:

1. Committee Organization

Selection of a chairperson was again deferred until a second assemblyperson was in attendance. Donald Moore will continue as acting chairman.

2. Centralized/Decentralized Program

A discussion ensued on the relative merits of centralized and decentralized programs. The committee discussed the potential objectives of an I/M program in the Fairbanks area and how well each type of program achieved those objectives. Potential objectives included:

a. designing program to reduce ambient carbon monoxide levels to attain the federal standard;

b. designing program most acceptable to the public, with the greatest personal convenience;

c. designing lowest cost program;

d. designing program which requires the least government involvement; and

e. designing program which gives adequate data base on emission reductions and other program parameters.

Issues pertinent to the centralized/decentralized question were also discussed. These included:

a. whether or not, in a decentralized program, to allow vehicles to be inspected and repaired at the same licensed facility;

b. which type of program would be most convenient to the public, based on the answer to (a);

c. the results of ADEC's Air Quality survey, as they related to this question; and

d. how well a decentralized program would fit with the public's winterization habits.

After much discussion Mr. Blake moved that the committee recommend a centralized I/M program to the Borough Assembly. This motion was seconded by Mr. Leonard. The committee approved the motion 4-1 with Mr. Brewer dissenting.

3. ADEC I/M Program Design Study Status

Richard Joy stated that the state had received four proposals in response to their Request for Proposals for design of I/M programs in Fairbanks and Anchorage. He and Tom Moyer will take part in an evaluation session next week in Anchorage to select the best proposal.

---

The committee agreed to meet again on Wednesday, July 20th, at 5:30 p.m., in the Borough Engineering Conference Room. Agenda items will include a presentation by staff of the contents of the selected proposal.

Committee on I/M Program Development

COMMITTEE MEETING

September 14, 1983
4:30p.m.

Engineering Conference Room

Committee Members Present:
Robert Blake, Borough Assembly
Mike Ribar, Borough Assembly
John Hargesheimer, Pollution Control Commission
Frank Abegg, Pollution Control Commission

Members Absent:
Ken Brewer
Lee Leonard
Bill Green

Staff Present:
Heather Stockard, FNSB
Richard Joy, FNSB
Len Verrelli, ADEC, Juneau
Tom Moyer, ADEC, Fairbanks
John Martin, ADOT/PF

Others:
Gary Rubenstein, Sierra Research
Jack Coutts

Items of Discussion:
The Committee again discussed the need for a chairman, Robert Blake nominated Mike Ribar for the position. This was seconded by John Hargesheimer. Mike was elected chairman by a unanimous vote. The committee then discussed the reconsideration of the type of I/M program to be considered. After much discussion Robert Blake moved that the committee recommend a centralized-type program to the Borough Assembly. This was seconded by Frank Abegg. The committee unanimously (4-0) approved this recommendation. Reasons for this recommendation include:

1. A centralized program would be easier to stop at any time in the future.

2. A centralized program will do the best job of collecting a valid, adequate data base regarding the effectiveness of an I/M program in the Fairbanks area.

3. A properly designed and operated centralized program will be the most effective type of I/M program in reducing CO emissions in the Fairbanks area.

4. A centralized program can be designed so that no capital outlays are required by any level of government to construct inspection facilities. The Contractor hired to operate the program would also be responsible for acquiring such facilities.

Mike Ribar then asked that Sierra Research furnish the committee with a preliminary list, by next Wednesday, September 21st, of future decisions which will need to be made during the program design. The next committee meeting will be held on Thursday, September 29th, at 4:30p.m., in the Engineering Conference Room. The purpose of this meeting will be to discuss this list.

RJ/ld

## VEHICLE INSPECTION AND MAINTENANCE PROGRAM RECOMMENDATIONS

prepared by

COMMITTEE ON I/M PROGRAM DEVELOPMENT

Mike Ribar, Borough Assembly
Robert Blake, Borough Assembly
John Hargesheimer, Borough Pollution Control Commission
Frank Abegg, Borough Pollution Control Commission
Ken Brewer
Lee Leonard
Bill Green

### OBJECTIVES

I. Design program to reduce ambient carbon monoxide levels to attain the federal carbon monoxide standard.

II. Design program most acceptable to the public, with the greatest personal convenience.

III. Design lowest cost program.

IV. Design program which requires the least government involvement.

V. Design program which gives adequate data base on emission reductions and other program parameters.

### RECOMMENDATIONS

I. The program should be a centralized-type program involving one central inspection facility owned and operated by a private contractor.

Reasons:

1. A centralized program would require less government involvement than a decentralized program.

2. An adequate data base would be easier to ensure in a centralized program.

3. A properly designed and operated centralized program will be the most effective in reducing CO emissions in the Fairbanks area.

4. A centralized program would be easier to stop at any time in the future.

Working Draft

Date of Recommendation: July 6, 1983

Voting Record:

For: Robert Blake, John Hargesheimer, Frank Abegg, Lee Leonard

Opposed: Ken Brewer

Reconsidered: September 14, 1983

Voting Record (Reconsideration):

For: Robert Blake, Mike Ribar, Frank Abegg, John Hargesheimer

Opposed: None

Absent: Ken Brewer, Lee Leonard, Bill Green

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761



Committee on I/M Program Development

COMMITTEE MEETING

September 29, 1983

4:30 P.M.

Engineering Conference Room

Committee Members Present:

Mike Ribar, Borough Assembly
Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Ken Brewer
Lee Leonard
Bill Green

Members Absent:

Frank Abegg, Pollution Control Commission

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, ADEC, Fairbanks

Others:

Bill Allen, Borough Mayor
Jack Coutts
Margaret Nelson, Fairbanks Daily News Miner

Items of Discussion:

Mayor Allen made a presentation to the Committee outlining the basic framework of his proposal for a mandatory decentralized I/M program in the Fairbanks area. A general discussion then ensued concerning the proposal, independent of the centralized/decentralized issue. The Committee unanimously agreed that they supported the other aspects of the Mayor's proposal, although several members felt that the technical details of the program needed to be worked out after more information was received from Sierra Research.

A long debate then ensued on the centralized/decentralized question. After much discussion, three members (Ribar, Blake, Hargesheimer) favored a centralized program while three (Green, Brewer, Leonard) favored a decentralized program. Although the Committee has formally voted twice in favor of a centralized program, Chairman Ribar ruled that, because of the large minority of members favoring a decentralized approach, this decision should be left to the Borough Assembly.

Therefore, he instructed the staff to set up a joint work session with the Committee and the Assembly, in order to address the centralized/decentralized issue.

The meeting was adjourned at 6:00 P.M.

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

October 31, 1983

Mr. Leonard Verrelli
Air Program Manager
Alaska Department of Environmental Conservation
Pouch O
Juneau, Ak 99811

Dear Mr. Verrelli:

On October 27, 1983 The Fairbanks North Star Borough Assembly voted to direct the Borough administration to contract with Sierra Research to develop a decentralized Inspection and Maintenance Program for the Fairbanks area in addition to their centralized program development which is being funded by the State of Alaska. These parallel program analyses will give the Borough Assembly the maximum technical information available on which to base their ultimate decision as to program type. During this process the I/M Development Committee will continue to serve as the local technical review committee for Sierra Research's work and will provide input into the development of both centralized and decentralized program formats.

Borough staff is currently waiting on a Letter of Proposal from Sierra Research for this additional work and will then enter into a contractual arrangement with the firm. I would therefore request that the State allow Sierra to continue to work on the centralized analysis for Fairbanks and Sierra will be instructed by the Borough to begin the decentralized analysis as soon as the contractual arrangements are finalized.

Thank you for your patience and cooperation in resolving this issue. Hopefully we can now proceed to develop these programs for their submittal to the Assembly. I would anticipate action on this matter as early as February 1984.

Sincerely,

Michael Ribar, Chairman
I/M Development Committee

MR/ja

7. Conformity

The metropolitan planning organization which oversees transportation planning in the Fairbanks area is the FMATS Policy Committee. This committee also has responsibility for overseeing development and approval of the air quality attainment plan. This committee will ensure that all transportation plans conform to the attainment plan prior to their approval. The Borough technical staff will review such transportation plans prior to their consideration by the committee and will recommend for or against approval based on the conformity question. Conformance will be determined by the following procedure.

a. The plans will be reviewed for projects that qualify as Transportation Control Measures (TCM) or clearly support transportation strategies presented in the attainment plan.

b. A determination will be made if any of the proposed transportation projects will adversely affect the TCMs contained in the attainment plan.

c. Projects will not be approved which:

   - reduce the effectiveness of the planned TCMs; and

   - delay further progress in reaching attainment by 1987.

## 8. Modeling

Design Concentration

In order to determine the reduction in projected emissions required to reach attainment by 1987 a simple rollback model is used. The basic premise of such a model is that ambient pollution concentrations are directly proportional to emissions from the area in which the concentrations are measured. This technique should be particularly valid for wintertime Fairbanks conditions since the absence of significant wind fields and the presence of very strong temperature inversions result in minimal pollutant transport into or out of the area.

Analysis of the data reveals the following second-highest annual maximum eight hour carbon monoxide concentrations for 1979, 1980 and 1981.

| | | |
|---|---|---|
| 1979 | - | 15.6 ppm |
| 1980 | - | 16.0 ppm |
| 1981 | - | 14.9 ppm |

In order to calculate the correct second-high concentration to be used in figuring the design value, the following equation is used:

(2nd high CO conc.) (relative emission factor) (relative growth factor)=design conc.

Since 1979 is the year of the baseline emissions inventory, the relative growth and emission factors for that year will equal 1.0. These factors can be calculated for the other two years by the use of indicators which represent these factors. Composite emission factors, from MOBILE 2, are used to calculate the relative emission factor. Annual average daily traffic counts from a fixed recorder on Cushman Street at the Chena River are used to figure the relative growth factor. Thus, the following design concentrations can be calculated.

| Year | 2nd High | Emission Factor (EFyr/EF79) | Growth Factor (AADTyr/AADT79) | Design Conc. |
|---|---|---|---|---|
| 1979 | 15.6 | 1.0 | 1.0 | 15.6 |
| 1980 | 16.0 | 0.948 | 0.990 | 15.0 |
| 1981 | 14.9 | 0.903 | 1.028 | 13.8 |

| | |
|---|---|
| EF79 = 202.15 gm/mile | AADT79 = 12,615 vehicles/day |
| EF80 = 191.67 gm/mile | AADT80 = 12,485 vehicles/day |
| EF81 = 182.55 gm/mile | AADT81 = 12,963 vehicles/day |

To calculate a design value an appropriate background concentration for the Fairbanks area must be estimated. The natural background for CO is commonly set at 1.0 ppm. Another factor which might affect the background concentration is area sources which cannot be reduced, such as residential heating sources, particularly wood stoves. An examination of the 1979 emission inventory shows residential heating sources to account for two percent of total CO emissions. This equates to about 0.3 ppm of the design concentration. Also, the City of Fairbanks currently has a district heating program in the preliminary stages which could reduce emissions from these sources. Therefore, a total background of 1.0 ppm is assumed for the Fairbanks area.

Air Quality Projection

The following equation is then used to calculate the reduction needed in 1979 emissions to attain the 9.0 ppm standard.

$$PRN = \left[ 1 - \frac{STD - B}{DC - B} \right] 100\%$$

Where:

PRN = percent reduction needed
STD = standard = 9.0 ppm
B = background = 1.0 ppm
DC = design concentration = 15.6 ppm

Therefore:

$$PRN = \left[ 1 - \frac{9.0 - 1.0}{15.6 - 1.0} \right] 100\% = 45.2\%$$

The 1979 emissions inventory showed an annual areawide total of 55,117 tons of carbon monoxide. Therefore, in order to reach attainment emissions would have to be reduced to 55,117 x (1.0 - 0.452) = 30,204 tons. Projected 1987 emissions are 38,226 tons so 8,022 additional tons of CO must be eliminated to attain the 9ppm standard. This is equivalent to an 21.0 percent reduction in projected 1987 emissions. Therefore, 21.0 percent is the figure used as the design value for this attainment plan.

Projected emissions for 1987 are contained in Table E.8-a. A more detailed description of the assumptions used to obtain those projections is in the Fairbanks air quality attainment plan. Using the method outlined above, results in a necessary reduction of 21.0% for a maximum eight-hour average by 1987. Analysis of the projected emissions shows that motor vehicles remain the overwhelming source of CO emissions within the Fairbanks nonattainment area.

Table C.8-a

1987 Areawide CO Emissions

| Source Type | | | |
|---|---|---|---|
| POINT SOURCES | | 182 | 0.5% |
| Vehicle Start-up | 15522 | | 40.6 |
| Vehicle Parking Lot Activity | 11023 | | 28.8 |
| Vehicle Travel | 8824 | | 23.1 |
| Vehicle Operation Subtotal | | 35369 | 92.5 |
| Aircraft Fuels | | 1282 | 3.4 |
| Fuel Oil Combustion | 75 | | 0.2 |
| Coal Combustion | 25 | | 0.1 |
| Wood Combustion | 1294 | | 3.4 |
| Heating Fuels Subtotal | | 1393 | 3.6 |
| AREA SOURCES | | 38044 | 99.5 |
| TOTAL EMISSIONS | | 38226 | 100.0% |

Vehicle start-ups and parking lot activity will account for over sixty-nine percent of the total areawide emissions with warm-mode vehicular traffic contributing another twenty-three percent of that total.

Although non-automotive area source emissions will increase significantly between 1979 and 1987 the total magnitude of these emissions is so small that this increase in emissions will not substantially affect the total emissions in the Fairbanks area. One area which will have to be watched closely is the emissions from residential and commercial heating with wood. Conservative estimates used to predict the growth of wood heating show that 3.4 percent of the area's CO emissions will be caused by that source by 1987. In actuality this figure may be even higher.

9. Contingency Plan

If the monitoring program shows that Reasonable Further Progress is not being made, the reason for this failure will be determined. A contingency plan, to be implemented if necessary to maintain RFP, will consist of a two-step approach. First, the I/M program will be analyzed to determine if it is feasible and desirable to increase its effectiveness. If this action is not feasible then a decision will be made to implement one of two additional strategies, either the preheater or the alternate fuel strategy.

10. Fairbanks Emergency Episode Prevention Plan

| | |
|---|---|
| By: | B. B. Allen |
| Introduced: | 05/16/85 |
| Advanced: | 05/16/85 |
| Postponed: | 06/06/85 |
| Substituted: | 12/19/85 |
| Amended: | 12/19/85 |
| Adopted: | 12/19/95 |

ORDINANCE NO. 85-065

AN ORDINANCE ADOPTING AN EMERGENCY EPISODE PREVENTION PLAN FOR CARBON MONOXIDE FOR THE FAIRBANKS AREA

BE IT ORDAINED by the Assembly of the Fairbanks North Star Borough, Alaska;

Section 1. Classification. This ordinance is of a general and permanent nature and shall become a part of the code of the Fairbanks North Star Borough.

Section 2. Adoption of Chapter 8.05. The following chapter is hereby adopted and shall be included as Chapter 8.05 of the Fairbanks North Star Borough Code of Ordinances.

Chapter 8.05

CARBON MONOXIDE EMERGENCY EPISODE PREVENTION PLAN

(attached as Appendix A)

Section 3. Effective date. This ordinance shall be effective on the day after its adoption.

PASSED AND APPROVED THIS 19TH DAY OF DECEMBER, 1985.

Presiding Officer

ATTEST:

Clerk of the Assembly

APPENDIX A

Chapter 8.05

CARBON MONOXIDE EMERGENCY EPISODE PREVENTION PLAN

Sections:



8.05.010 Purpose. The Fairbanks Area Emergency Episode Prevention Plan is designed to prevent carbon monoxide concentrations within the Borough from reaching levels which endanger the public health. Primary responsibility for implementation of this plan rests with the Borough's Environmental Services Division.

8.05.020 Episode Criteria. During the months of November through February of each winter the Borough issues twice-daily carbon monoxide forecasts, at 6:30 a.m. and 3:30 p.m. These forecasts are based on CO data collected by the Borough from the carbon monoxide analyzer network. When the CO concentration reaches the onset level for an episode stage and is expected to either remain at that level for 12 hours or return to the level within the next 24 hours, an episode stage will be declared. Once an episode stage is declared the actions mandated for that stage will be continued until measurements indicate that another stage (lower or higher) has been reached. The actions from that next stage will then be implemented. This procedure will continue until the episode is terminated.

The following episode stage criteria are hereby adopted:

Stage 1. Alert: 15 parts per million (ppm) for an 8-hour average.

Stage 2. Warning: 30 ppm for an 8-hour average.

Stage 3. Emergency: 40 ppm for an 8-hour average.

8.05.030 Emergency Prevention Strategies. Actions taken in Stage 1 and Stage 2 of a carbon monoxide episode consist of strategies aimed at preventing an air pollution emergency (40 ppm for an 8-hour average) from occurring. These emergency prevention strategies involve enlisting voluntary cooperation from the populace of the Borough in reducing the carbon monoxide levels in the area.

When a Stage 1 Alert (15 ppm for an 8-hour average) is implemented, the following actions will be taken:

1. The Borough will announce an Air Quality Alert via the daily forecasts and ask the public to eliminate unnecessary vehicle idling and driving.
2. The Borough will initiate an event log and actions taken during the alert will be recorded.
3. The Borough will alert all concerned agencies by telephone.
4. The Borough will eliminate fares on the Borough's transit system for the duration of the alert.
5. Above 20 ppm, the Environmental Services Director will announce an open burning prohibition. All radio stations will be notified and asked to carry P.S.A.'s announcing this prohibition.
6. Above 20 ppm the Borough will make radio announcements asking persons who may be physically sensitive to avoid congested traffic areas.
7. Above 20 ppm the Borough will contact vehicle fleets and ask for cooperation in reducing traffic activity into the high carbon monoxide areas.
8. Above 20 ppm the Borough will ask radio stations to run frequent P.S.A.'s requesting the public to reduce vehicle idling and driving as much as possible and to preheat vehicles that must be driven to reduce cold-start emissions.
9. Borough personnel will be dispatched into the field with portable carbon monoxide analyzers to define the boundaries of the high CO areas.
10. Above 20 ppm, the Division of Environmental Services' office will maintain an around-the-clock watch until CO levels decrease.

When a Stage 2 Alert (30 ppm for an 8-hour average) is implemented the following actions will be taken:

1. Stage 1 actions are continued.
2. The Borough will ask all vehicles not to enter the high carbon monoxide areas as defined by the Borough.
3. The Borough will ask employers and employees in the high concentration area are asked to carpool or to use the transit system.
4. The Borough will ask the City Police to ticket any unattended idling vehicles within the high CO areas.

8.05.040 Emergency Abatement Strategies. Stage 3 actions consist of continuing the voluntary prevention measures initiated in Stages 1 and Stages 2 of the air pollution episode, coupled with the implementation of mandatory emergency abatement strategies designed to quickly reduce carbon monoxide concentrations within the affected area.

When a Stage 3 Alert (40 ppm for an 8-hour average) is implemented the following actions will be taken:

1. Stage 1 and 2 actions are continued.
2. A task force comprised of the Fairbanks City Manager, the Borough Mayor, and the Governor's representative in Fairbanks will direct the implementation of the following mandatory strategies.
   a. All City of Fairbanks, State, and Borough employees are excused from work, with the exception of emergency employees.
   b. The task force will ask all employers located within areas exceeding 40 parts per million of CO for an 8-hour average to excuse their employees from work and to close their businesses until the Stage 3 episode is abated.
   c. The task force will request that the City Police close the areas exceeding 40 parts per million to any traffic other than emergency vehicles.

8.05.050 Episode Termination. As the episode abates and the carbon monoxide concentrations decrease, the actions specified for each stage will be discontinued as the level drops below and is expected to remain below the onset concentration for that stage.

2LD

FAIRBANKS NORTH STAR BOROUGH

PROCEDURE
04.02.009

Revised: 04-23/85
Page: 1

EMERGENCY EPISODE PREVENTION PLAN

I. GENERAL

The Fairbanks North Star Borough is responsible for maintaining and improving air quality within the Borough. As part of this function, the Borough has responsibility for ensuring that air pollution levels do not reach emergency concentrations adversely affecting the health of Borough residents.

II. PURPOSE

The Fairbanks Area Emergency Episode Prevention Plan is designed to prevent carbon monoxide concentrations within the Borough from reaching levels which endanger the public health. Because 96 percent of the carbon monoxide emitted in the Fairbanks area is discharged from mobile sources this plan contains no provisions for regulating emissions from stationary sources during pollution episodes. Any such regulations would have little benefit and would not be cost effective. Strategies in this plan will rather focus on actions to be carried out by both motor vehicle fleets and owners of individual vehicles. During the initial stages of the Episode Prevention Plan these actions will be requested on a voluntary basis but if the air quality continues to worsen certain regulations will become mandatory.

III. RESPONSIBILITY

Primary responsibility for implementation of this plan rests with the Environmental Services Director.

IV. DEFINITIONS

A. Alert (Stage 1): 15 ppm for an eight-hour average

B. Warning (Stage 2): 30 ppm for an eight-hour average.

C. Emergency (Stage 3): 40 ppm for an eight-hour average.

D. Parts Per Million (ppm): An expression of carbon monoxide values found in the ambient air. The federal government has established a standard of 9 ppm for an eight hour average ad the maximum allowable level, not to be exceeded more than once per year.

E. P.S.A.: Public Service Announcement; a short advertisement broadcast free of charge by the news media in the public interest.

V. IMPLEMENTATION

A. Episode Criteria
Implementation of this plan is based on actual carbon monoxide (CO) data collected by the Borough from the CO analyzer network. Each episode stage will be implemented when the CO concentration reaches the onset level for the stage and is expected to either remain at that level for 12 hours or return to the level within the next 24 hours. Once an episode stage is declared the actions mandated for that stage will be continued until measurements indicate that another stage (lower or higher) has been reached. The actions from that next stage will then be implemented. This procedure will continue until the episode is terminated.

B. Alert (Stage 1)

1. Announce an Air Quality Alert via the daily forecasts and ask the public to eliminate unnecessary vehicles idling and driving.

2. Initiate an event log and record actions taken during the alert.

3. Alert all concerned agencies by telephone.

   a. Alaska Department of Environmental Conservation
      Northern Regional Office, 452-1714
      Contact: Jack Coutts

   b. U.S. Environmental Protection Agency,
      Alaska Operations Office, 586-7619
      Contact: Steve Torok

4. Contact the Borough Transit Division to eliminate fares on the transit system for the duration of the episode.

5. The Environmental Services Director shall announce an open burning prohibition if CO levels exceed 20 ppm for an eight-hour average. Ask all radio stations to carry P.S.A.'s announcing this prohibition.
   Radio stations to be contacted are:

   a. KFAR 452-6221 (AM)/456-5327 (PM)
   b. KCBF 452-5121
   c. KIAK 457-1921
   d. KJNP 488-2216
   e. KUAC 474-7491
   f. KGHX 452-5449
   g. KAYY 452-5299
   h. KQRZ 457-1921
   i. KATN 452-5188

A sample P.S.A. would be: "The Fairbanks North Star Borough has declared an Air Quality Alert for Fairbanks area. All persons current conducting open burning within (define area of prohibition) should extinguish any fires and refrain from burning until this alert is cancelled. Thank you for your cooperation in reducing carbon monoxide levels in our community.

6. Above 20 ppm make radio announcements asking persons who may be physically sensitive to avoid congested traffic areas.

7. Above 20 ppm contact vehicle fleets to ask for cooperation in reducing traffic activity into the high carbon monoxide areas.

   a. University of Alaska, Department of Safety and Security, Health and Security Building - Fairbanks campus, 474-7721.

   b. State of Alaska, Office of the Governor, 675-7th Station H, 452-1545.

   c. Alaska Department of Transportation/Public Facilities, Interior District Office, 2301 Peger Road, 452-1911, ext. 203.

   d. Municipal Utilities System, 645 Fifth Avenue, 456-1000, ext. 245.

   e. Golden Valley Electric Association, 758 Illinois Street, 452-1151.

   f. General Services Administration, GSA Motor Pool, 101-12th Avenue, 452-1951, ext. 217.

   g. City of Fairbanks, Public Works Superintendent, 2121 Peger Road, 452-2360.

   h. U.S. Postal Service, Customer Service Director, 1257 Mail Trail, 452-6014, ext. 236.

   i. Fairbanks North Star Borough School District Office, 452-2000, ext. 258.

8. Above 20 ppm ask radio stations to run frequent P.S.A.'s requesting the public to reduce vehicle idling and driving as much as possible and to preheat vehicles that must be driven to reduce cold-start emissions. A sample P.S.A would be:

   "The carbon monoxide concentration has risen to an extremely high level of _____ parts per million for an 8-hour average. The public is asked to cooperate in reducing vehicle idling or driving to an absolute minimum. If you must drive, plug in your car for a couple of hours before you start it up. This will result in lower startup emissions and help reduce the carbon monoxide levels in the air. Remember the bus is free during this air quality alert so ride rather than drive if possible. Thank you."

9. Dispatch personnel into the field with portable carbon monoxide analyzers to define the boundaries of the high CO areas.

10. Above 20 ppm, the Division of Environmental Services' office will maintain an around-the-clock watch until CO levels decrease.

C. Warning (Stage 2)

1. Stage 1 actions are continued.

2. Ask all vehicles via radio to not enter the high carbon monoxide areas as defined by the Borough.

3. Ask employers and employees in the high concentration area to carpool or to use the transit system.

   a. Fairbanks North Star Borough and School District, City of Fairbanks, State of Alaska, U.S. Post Office and General Service Administration are contacted and asked to request their employees cooperation in this effort.

   b. Others are contacted via radio announcements such as:

   "The current carbon monoxide concentration is _____ parts per million at the Borough's monitor. In order to prevent the CO from reaching dangerous levels the Borough is asking employers and employees in the __________ (location) area to carpool or ride the bus or otherwise reduce driving until the current air pollution episode is abated. Carpool drivers should plug in their vehicles for a couple of hours before starting, especially after work, to reduce cold-start emissions. Please do not drive in the area bounded by __________ (location) as this area has been identified as having extremely high levels of carbon monoxide. Thank you for your cooperation."

4. Ask the City police to ticket any unattended idling vehicles within the high CO areas.

D. Emergency (Stage 3)

1. Stage 1 and 2 actions are continued.

2. A task force comprised of the Fairbanks City Manager, the Borough Mayor, and the Governor's representative in Fairbanks will direct the implementation of the following mandatory strategies.

a. All government employees are excused from work.

b. All employers located within areas exceeding 40 parts per million of CO for an 8-hour average are asked to excuse their employees from work and to close their businesses until the Stage 3 episode is abated.

c. The City police are asked to close the areas exceeding 40 parts per million to any traffic other than emergency.

E. Episode Termination

As the episode abates and the carbon monoxide concentrations decrease the actions specified for each stage will be discontinued as the level drops below and is expected to remain below the onset concentration for that stage.

## D. TOTAL SUSPENDED PARTICULATE MATTER

Total Suspended Particulate Matter is discussed in Section V of this volume.

## E. ICE FOG

Ice fog is a cold weather phenomenon which occurs at temperatures of about -35°F whenever water vapor or drops are emitted into the air. However, it only becomes a problem if there are many water vapor sources within a small area, such as in Fairbanks. At such cold temperatures the water vapor, which is formed in any combustion process, almost immediately forms ice crystals which have the potential of greatly reducing visibility.

Ice fog can be generated from many sources, such as motor vehicles, home heating furnaces, power plants, municipal utilities systems, sewer treatment facilities, cooling ponds, and open sections of local rivers.

There are no national ambient air quality standards for ice fog. There also is very little quantitative data known on whether ice fog is a substantial health hazard, although it certainly presents a safety hazard when it occurs.

The State has the authority to require potential stationary sources in areas of potential ice fog to obtain a permit to operate and to reduce water emissions (18 AAC 50.090).

## F. OPEN BURNING

Control of open burning incidences for smoke pollution is the responsibility of the Department. Open burning is defined as "the burning of a material which results in the products of combustion being emitted directly into the ambient air without passing through a stack or flare." All open burning in the state, whether requiring written approval from the Department or not, must be done in a way that maintains maximum combustion efficiency throughout the burning period. Achieving maximum combustion efficiency means the following are attempted:

- material is dried through covering or storage;
- noncombustibles are separated before burn;
- natural or artificially induced draft is included;
- combustibles are separated from grass layer or peat layer (a noncombustible firebreak is made to contain the fire); and
- combustibles are not allowed to smolder (burn and smoke without flame).

Open burning is prohibited if the material burned is:

- pesticides, halogenated organic compounds, cyanic compounds or polyurethane products burned in a way that gives off toxic or acidic gases or particulates; or
- putrescible garbage, animal carcasses, or petroleum-based materials burned in a way that causes odor or black smoke to have an adverse effect on nearby persons or residences.

Open burning at landfills is also controlled by solid waste disposal regulations, 18 AAC 50.060.

<u>Who needs written approval?</u>

Certain types of open burning require written approval from the Department prior to the incident. These are the burning of

- petroleum-based materials or other materials in a way that gives off black smoke, including fire fighter training;
- material from land-clearing operations for agricultural or development purposes of 40 acres or greater, based on the total amount of land to be cleared over the life of the project; or
- material for the management of forest land, vegetative cover, fisheries of wildlife habitat, except burning to combat a natural wildfire.

If human safety may be endangered or to protect the environment for example during an oil spill about to enter a watershed, verbal approval is adequate with a followup letter.

Approval application requirements

Persons seeking approval to open burn may be required to submit a plan addressing the following smoke control concerns:

1. Location and inclusive dates considered for fires to the extent possible. The plan should state the expected duration the fire would be allowed or expected to burn.

2. The location of all sensitive population centers, ground travel routes, airport or other activities that should not be impacted by smoke.

3. Where the weather forecasts will be obtained and how they will be used to prevent smoke problems.

4. How weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition.

5. What the considerations are for visibility impacts.

6. How coordination with air quality authorities having jurisdiction will be accomplished.

7. The procedures that will be used to coordinate with other concerned agencies such as the FAA, State Troopers, military, adjacent land managers, etc.

8. How the public will be informed prior to, during and after the burning.

9. What will be done to validate predicted smoke dispersal conditions such as a test fire, smoke bomb, etc.

10. What will be done to validate predicted smoke dispersal conditions such as a test fire, smoke bomb, etc.

11. For fires other than for fire fighter training an evaluation of alternatives to open burning, demonstrating open burning is the only feasible alternative.

Persons with approved open burning plans should work directly with the National Weather Service Fire Weather Forecasters to obtain spot weather forecasts for expected smoke conditions at each specific burn site. The forecaster should be requested to give the reliability of the forecast. Persons with approval must curtail their fire if their portion of the airshed is becoming overloaded or local weather factors would create smoke problems, even though no other restrictions have been imposed, i.e., wind moving directly into sensitive areas, inversions, etc. The final responsibility for smoke control problems rests with applicant.

It is also the responsibility of the applicant to show all possible alternatives to open burning have been analyzed and why open burning is the only feasible alternative.

Written approval is not automatic but must be evaluated for conformance with these guidelines:

FIRE TRAINING

Fire fighter training must conform to 18 AAC 50.030(b)(1)--public notification. This can be waived in writing by the Department for burns conducted in remote areas, where the news media is not generally available or where no public will be affected. Alternatives can be allowed such as a monthly or yearly announcement of burns if the requirements of 18 AAC 50.030(b)(1) cannot be met.

INDUSTRIAL

Open burning of oil or gas well flow tests must conform to 18 AAC 50.030(b)(2). It is the intent of the Department to eliminate open burning of liquid hydrocarbons because alternative measures are generally available. If alternatives become indisposed through equipment breakdown or inclement weather, this does not constitute the non-availability of alternatives.

LAND CLEARING

Prescribed burning, intentionally set fires to burn off ground and forest cover is usually, but not always, done by land management agencies. Each applicant will have an operational plan of action documenting the weather conditions under which the use of prescribed fire will be authorized, and contingency actions to follow if prescriptive conditions are exceeded. Plans for burning that may impact sensitive areas such as population centers or airports will require more specific detail than plans for remote areas. A complete burn plan is required for each prescribed fire.

Since prescribed burning is the burning off of ground cover, the normal requirements of "maximum combustion efficiency" does not completely apply. Applicants should discuss in detail how they are to conduct the burn. Lack of achieving "maximum combustion efficiency" will not, in itself constitute a reason to deny an application.

RESOURCE MANAGEMENT

Open burning of slash material by farmers and developers is subject to obtaining written approval if the intent is to clear 40 acres or more over the life of the project. A complete burn plan is required for the burns planned for each year.

Open burning should be done as rapidly as safety and other considerations permit to develop maximum heat energy per unit time and and vent the smoke to the highest elevation possible.

Burning of dried material is favored because:

- higher heat energy with a related tall convection columns can be developed;
- cured material produces less smoke per unit volume than green material; and
- the medium size and larger fuels can be more effectively burned when cured and thus more satisfactorily remove the fire hazard.

Approval Issuance

The following conditions as modified to fit the specific open burning situation may be included in the
letter of approval:

- The applicant may be required to obtain meteorological information for the burn day, specifically wind speed, wind direction and ceiling level, both for the start of the burn and forecasted for the duration of the burn. If the wind directin would allow smoke to impact on sensitive areas, burning may be denied for that period.
- If the department determines that the airshed is being overloaded with smoke, a termination of the existing and proposed burning may be required. Limitations may have to be placed on the burn for easy shutdown..
- Notification at least one day in advance of burning attempts should be provided to the department's regional office. If burning is not conducted for that day, renotification is required on the day burning commences.
- A summary report listing tyes of fuels and quantities burned, days burning occurred, and the meteorological conditions during the burn should be sent to the department.
- The approval letter must be sent out within thirty days after receipt of a completed application.
- The approval letter must have a date of expiration.

Smoke

There is a need for the development of an Alaska Smoke Management Plan to control open burning. Due to the interagency concerns over such a document, the Smoke Management Working Group of the Alaska Interagency Fire Management Council should assist in developing the document for inclusion into this section.

Open Burning Prohibition

Open burning can be prohibited on an area-by-area basis if an air quality advisory is broadcast on a radio or television covering the area of concern. This advisory can be for a maximum of twenty-four hours but may be renewed daily. The advisory will be based on an assessment that inadequate air ventilation is available which would inhibit the dispersal of pollutants, such as inversions and low wind speeds.

G. WOOD SMOKE POLLUTION CONTROL

1. Problem Description

Use of residential wood-fired heating devices has been demonstrated to cause air quality problems in locales where atmospheric ventilation is low, wood use per capita is high and the populations density is moderate to high. State and federal 24-hour standards for total suspended particulate matter (TSP) have been exceeded several times in portions of the Mendenhall Valley of Juneau.

Although TSP is the pollutant of primary concern, a potential for exceeding the eight-hour carbon monoxide standard does exist when particulate exposure is significantly above the health standard.

Wood use and hence wood smoke occurs in a large number of cities and communities throughout Alaska. However, climatic conditions are usually sufficient to disperse the pollution from the area. Although the Juneau area is presently the only known location to exhibit unhealthful air quality due to wood burning, this pollution problem will most likely increase in portions of the state where wood resources are plentiful.

Administrative procedures to maintain ambient air quality standards in locations where emissions from residential wood burning activities threaten public health are outlined in the following pages of this section.

2. Problem Assessment and Initial Control

The Department will install and operate air quality monitors in locations where wood smoke pollution is considered significant. If measured exposures approach or exceed the ambient standards, the relative impacts of all local activities will be assessed towards their respective contribution to the ambient exposure. If exposures are anticipated to reach or exceed the air quality alert value of 375 micrograms per cubic meter (ug/m$^3$) [see 18 AAC 50.610(a)(1)(B)], the Department will issue an air quality alert and enforce the requirements of 18 AAC 50.085(1). Additional air quality alerts will be issued when similar atmospheric and wood stove use conditions recur that may cause exposures above the ambient air quality standards.

Should exposures reach or exceed 150 ug/m$^3$ when wood smoke pollution is considered to be the major contributor, additional chemical analysis, approved chemical mass balance techniques and receptor models will be utilized to discern the actual impact of all local sources to the ambient exposure.

3. Local Government

Wood smoke pollution problems tend to be very characteristic of specific conditions such as frequency and severity of air stagnations, local terrain features, seasonal and daily wood use patterns, and type and quantity of wood and wood-burning appliances.

Because of these factors, adverse air quality conditions are best managed by the local government entities. The Department will assist communities in the development of appropriate and adequate air quality management plans. Volume III of this document contains the ordinance 83-63 of the City and Borough of Juneau.

4. Designation of Wood Smoke Control Areas

Specific locations based upon natural airshed boundaries may be designated as Wood Smoke Control Areas, allowing enforcement of stricter standards. Upon designation, the requirements of 18 AAC 50.085(3) are implemented. Boundaries for designated areas shall be defined as the natural, physical boundaries which establish the airshed or a portion of the airshed if sufficient technical information warrants designation of the smaller area. Additional control strategies to curb the existing and future emission quantities may also be needed. These additional strategies are best defined and implemented by local government. However, they can be developed and implemented by the Department.

Prior to designation as a Wood Smoke Control Area, two requirements must be met:

- Ambient exposures of TSP from residential wood-burning activities alone must have reached or exceeded 150 $ug/m^3$ on a minimum of two separate days using the analytical techniques outlined above in (2);
- The proposed designation requires a public notice and comment period.

5. Boundaries of Designated Wood Smoke Control Areas

Designated Wood Smoke Control areas include the Mendenhall Valley of Juneau, which is described as the area located between the terminus of the Mendenhall Glacier and the tidewaters of Gastineau Channel and Fritz Cove. This area is bounded on the east by the 500-foot elevation contour of Heintzleman Ridge, (Thunder Mountain and contiguous foothills), extending south from the Mendenhall Glacier to a point directly north of the eastern terminus of the runway for the Juneau International Airport. The western border of the area is defined as the northern border of Section (S) 6, Township (T) 40S, Range (R) 66E of the Copper River Medidian (CRM) beginning at its northeast corner and heading westerly to the northwest corner of S1, T 40S, R65E, CRM (approximately beginning at the 500-foot level of the Mendenhall West Glacier Trail and heading 2 miles directly west) and thence southerly along the western borders of Section 24 (a north-south line from the approximate southwest base of Mount McGinnis along the east side of Auke Lake to approximately 0.3 mile east southest of the southern shore of Auke Lake). At this point, the boundary is described be a westerly heading along the northern border of S26, T40S, R65E, CRM to a location directly north of the knoll named Pederson Hill. A direct southerly heading forms the described position through the top of Pederson Hill to the tidewaters of Fritz Cove serves as the final portion of the western boundary (boundary essentially divides the Mendenhall Peninsula along the north-south ridge line).

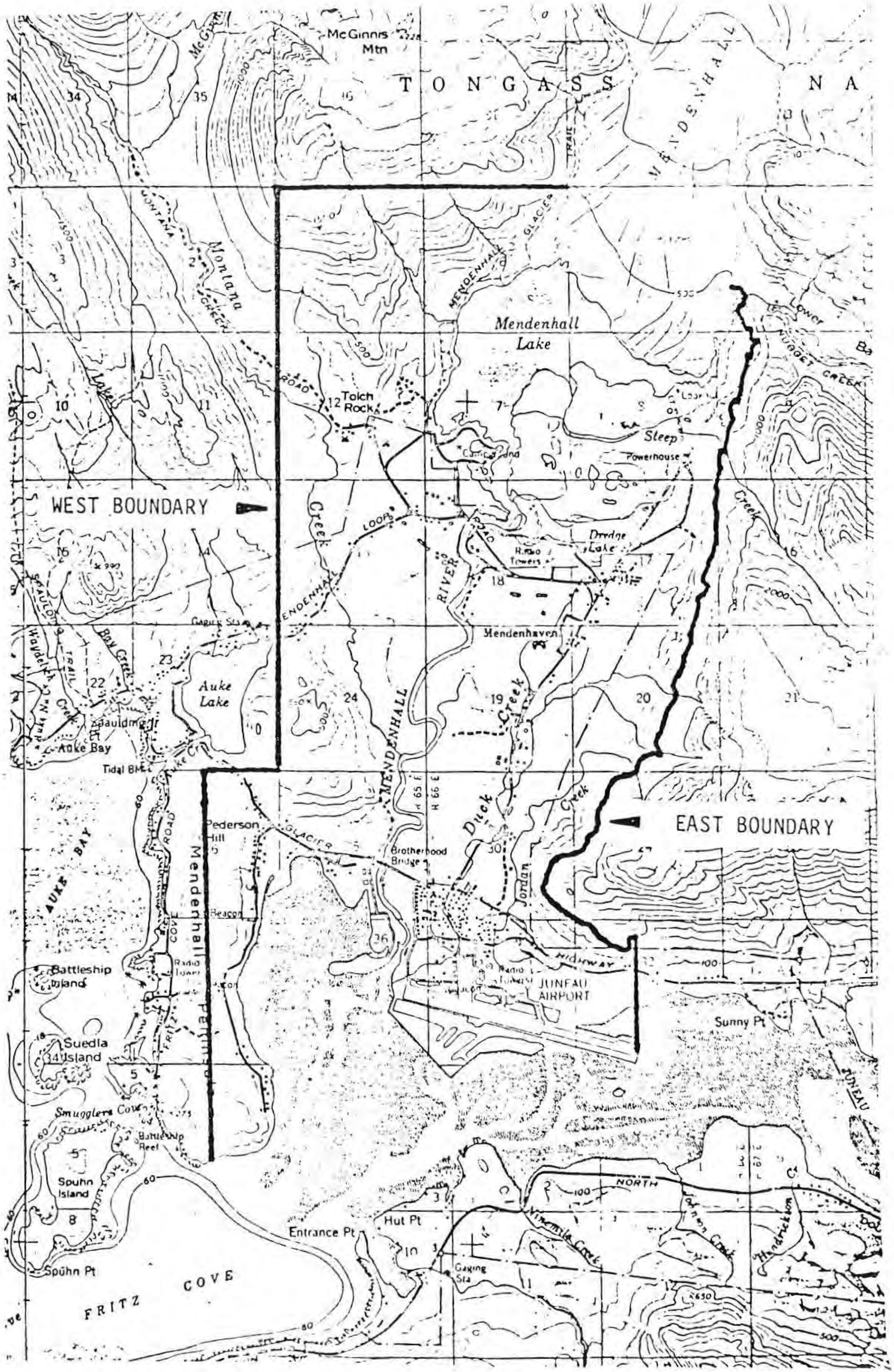


Figure III. G-1
MENDENHALL VALLEY WOOD SMOKE CONTROL AREA

## H. LEAD POLLUTION CONTROL

### 1. General

Existing exposures of lead in the ambient air are generated primarily through the use of lead contained in gasoline. Because of the carbon monoxide problem in Anchorage and Fairbanks from vehicular traffic, an air monitoring program was initiated in both cities to measure ambient concentrations of lead. Data collected for the period of March 1980 through March 1982, shown in Table III.H.1, indicate that exposures are below the specified ambient standard of 1.5 micrograms per cubic meter of air (quarterly arithmetic mean exposure). Other areas of the state are projected to exhibit even lower exposures since vehicular activity is less. At the present time, no industrial or mining activities occur which emit sufficient quantities of lead to adversely affect the air quality. Phasing out automobiles which utilize leaded fuel and diminishing the lead content of gasoline will continue to diminish lead exposures. Additional support documents regarding the assessment of this pollutant in the Alaska environment are presented in Section III.H of Volume III of this document.

### 2. Sources of Lead Emissions

Two small lead acid battery manufacturing plants located in Anchorage and Fairbanks produce approximately 50 and 20 batteries per day respectively. These facilities emit approximately 280 and 112 lbs. of lead per year at each respective location. Other than these minor sources, all emissions of lead are emitted either directly to the air from vehicle tailpipes or indirectly as re-entrained road dust. Projected vehicle emissions at each of the cities are presented in Table III.H.-1.

### 3. Control of New Emission Sources

Several criteria are established in Article 3 of the State Air Quality Control Regulations to prevent new facilities or other industrial activities from creating an ambient air quality problem for lead. Although each of these criteria are established for specific types of activities, the combined effect is to ensure that all proposed facilities that may emit large quantities of lead are reviewed by department personnel prior to issuance of a permit to operate.

Table III.H-1

ALASKA AMBIENT LEAD DATA
-Quarterly Arithmetic Mean Values
April 1980-March 1982

| | | Fairbanks Nordale School SAROAD ID# 020160017G01 | | Fairbanks Borough Bld #2 SAROAD ID# 020160016G01 | | Fairbanks State Office Building† SAROAD ID# 020160010F01 | | Anchorage 8th & L Street SAROAD ID# 020040020I01 | | Anchorage City Fire Station SAROAD ID# 020040005I01 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Calendar Quarter | Sample Days | Ave [Pb] $ug/m^3$ | Sample Days | Ave [Pb] $ug/m^3$ | Sample Days | Ave [Pb] $ug/m^3$ | Sample Days | Ave [Pb] $ug/m^3$ | Sample Days | Ave [Pb] $ug/m^3$ |
| 1980 | 2 | 15 | 0.18 | 12 | 0.18 | | | 15 | 0.33 | 15 | 0.60 |
| | 3 | 11 | 0.15 | 13 | 0.31 | | | 16 | 0.32 | 16 | 0.57 |
| | 4 | 7 | * | 7 | * | | | 14 | 1.08 | 15 | 1.25 |
| 1981 | 1 | 13 | 0.90 | 14 | 1.07 | | | 14 | 0.44 | 15 | 0.67 |
| | 2 | 11 | * | 13 | 0.30 | | | 15 | 0.29 | 15 | 0.49 |
| | 3 | 9 | * | 13 | 0.29 | 13 | 0.27 | 15 | 0.27 | 13 | 0.47 |
| | 4 | 15 | 1.02 | 13 | 0.87 | 10 | 1.17 | 13 | 0.56 | 13 | 0.73 |
| 1982 | 1 | 10 | * | 14 | 1.08 | 10 | 0.88 | 13 | 0.47 | 14 | 0.78 |

† Lead analysis of TSP samples at this site began June of 1981.

* Insufficient data from which to calculate an arithmetic mean value (i.e. minimum 10 sample days with at least 2 samples in each month.

Table III.H-2

PROJECTED LEAD EMISSIONS

1977 - 1987

TONS PER YEAR

| YEAR | ANCHORAGE | | | FAIRBANKS | | |
|---|---|---|---|---|---|---|
| | VEHICULAR | | POINT SOURCE | VEHICULAR | | POINT SOURCE |
| | tailpipe | road dust | | tailpipe | road dust | |
| 1977 | 17.13 | 22.96 | <1 | 3.63 | 3.50 | <1 |
| 1978 | 15.67 | 24.11 | <1 | 3.28 | 3.67 | <1 |
| 1979 | 13.93 | 25.36 | <1 | 3.38 | 3.86 | <1 |
| 1980 | 8.97 | 8.86 | <1 | 2.18 | 1.35 | <1 |
| 1981 | 5.78 | 9.40 | <1 | 1.40 | 1.42 | <1 |
| 1982 | 4.99 | 9.87 | <1 | 1.21 | 1.49 | <1 |
| 1983 | 4.53 | 4.35 | <1 | 1.10 | 0.66 | <1 |
| 1984 | 4.06 | 3.81 | <1 | 0.99 | 0.57 | <1 |
| 1985 | 4.07 | 3.43 | <1 | 0.99 | 0.52 | <1 |
| 1986 | 4.47 | 3.60 | <1 | 1.08 | 0.54 | <1 |
| 1987 | 4.88 | 3.78 | <1 | 1.18 | 0.57 | <1 |

SECTION IV

POINT SOURCE CONTROL PROGRAM

REVISED 10/30/83

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ALASKA AIR QUALITY CONTROL PLAN

## SECTION IV

## POINT SOURCE CONTROL PROGRAM

### A. SUMMARY

The objective of the Air Quality Control Program is to ensure ambient air quality does not adversely affect the health or general welfare of the public. One way is to limit the rate or quantity of pollutants discharged to the air at industrial, governmental and commercial sources. This section describes the permit and compliance program developed to assure major sources of air pollutants maintain compliance with regulations.

Section IV.B is a discussion of the State Air Quality Control Regulations as revised concurrently with this Plan.

Section IV.C discusses the role of the local air programs in Anchorage and Fairbanks in assuring air quality compliance of Alaskan facilities.

Section IV.D includes a general description of the types of sources in Alaska and which pollutants are emitted from them. Technologies applicable to control these pollutants are also described. A summary of the state's emission inventory for the major facilities in the state which emit air pollution is included, along with a detailed description of the status of facilities which have requested variances from the State regulations.

Section IV.E describes the point source control program in general.

Section IV.F is a discussion of permit application procedures.

Section IV.G describes the application review and permit development. The procedural aspects, permit requirements and monitoring/testing requirements are presented in detail. A major subpart is a description of the review procedures of the Prevention of Significant Deterioration section of the permit program.

Section IV.H presents the permit issuance procedures.

1. Annual Review Report

The Alaska Department of Environmental Conservation will publish an annual review of the state air permit program. The review will include the following:

- A listing of the PSD activity during the previous year including the number and description of PSD permits granted and under review;
- The level of PSD increment consumption in each area of the state;
- Visibility status of each Class I area and other areas identified in 18 AAC 50.021(c); and
- A nonattainment status report for each area in nonattainment with the limits listed in 18 AAC 50.020.

## B. STATE AIR QUALITY CONTROL REGULATIONS

The Alaska Air Quality Control Regulations 18 AAC 50 underwent major revisions during 1979 to incorporate new source emission standards, and more comprehensive and streamlined permitting requirements. These revisions also included the mandatory federal requirements relating to several New Source Performance Standards and Prevention of Significant Deterioration, so that Alaskan stationary sources could comply with applicable air quality requirements through the State Permit to Operate system.

The air quality regulations were revised in 1982 to include the changes made by the August 1980 amendments in the federal regulations, the incorporation of the visibility control program, and assumption of several NSPS regulations.

The 1983 revisions included the changes to the wood smoke control section of the regulations and the incorporation of the recent version of the State Implementation Plan into the regulations.

The most recent version of the regulations are contained in a yellow booklet available from any regional office of the department.

## C. LOCAL POINT SOURCE CONTROL PROGRAMS

The Department of Environmental Conservation currently has full responsibility for controlling stationary source emissions within local jurisdictions by carrying out the Permit to Operate system requirements in 18 AAC 50.300 and 18 AAC 50.400 and all other point source control activities. A local program may request delegation of the permit system if it has regulations at least as stringent as the applicable state regulations and has demonstrated the capability to adequately carry out all aspects of the program, including the requirements set out by Alaska Statutes section 46.03.210-230.

As of November, 1983, no delegation of point source control has occurred to any local programs in the state.

## D. DESCRIPTION OF SOURCE CATEGORIES AND POLLUTANTS

### 1. Typical Point Sources

Sources in the southeastern Alaska region are primarily related to timber processing. Several sawmills and two pulp mills are currently in operation. Particulate matter is generated by burning bark, sawdust and woodwaste in boilers or incinerators with oil used to help burn the material. Mechanical collectors remove soot and ash, but fine salts which permeate the logs during storage and transport in salt waters are not removed by these devices. At the pulp mills, the salt emissions from the chemical recovery boilers are also significant. High efficiency control units have been recently developed to control these emissions including sophisticated wet electrostatic precipators, mist eliminators, and scrubbers.

Sulfur dioxide results from combustion of high sulfur fuel oil with woodwaste in power boilers and from red liquor in the chemical recovery boilers. The chemical recovery system removes sulfur dioxide from the exhaust gas to make the acid needed for the pulping process. The particulate control systems also remove sulfur dioxide from the exhaust.

Sources in the southcentral and Cook Inlet Alaska regions are primarily related to oil and gas production, transportation, and processing. Electricity generation is another major industry. The primary emissions from both power generation and oil and gas industrial sources are oxides of nitrogen. Nitric oxide (NO), a nondesignated pollutant, constitutes over 90% of these emissions. However, it is often converted to the pollutant gas nitrogen dioxide ($NO_2$) by complex reactions in ambient air. This conversion depends on many factors, including available sunlight, and does not always occur. Recent developments in oxides of nitrogen control technology require changes in the fuel combustion process.

Where oil is used for fuel, sulfur dioxide is also emitted. Union Chemicals ammonia/urea plant emits ammonia in large quantities and has a prill tower which is the major industrial source of particulates in the Kenai area. At the Alyeska Pipeline terminus in Valdez a pollution source is the tanker traffic. Fuel oil containing an average of 1.5% sulfur powers the oil tankers and ballast discharge pumps and sulfur dioxide is generated.

Sources in the northern Alaska region are primarily related to oil production and transportation. At Healy and in Fairbanks, energy is produced at coal-fired utility plants. These coal-fired boilers, major sources of particulate matter, are controlled by multiclones. The emissions at Healy are controlled by a high efficiency fabric filtration unit.

Sources of air pollution on the North Slope are primarily large gas turbines used for gas and seawater injection into the ground to increase the amount of oil available, for pumping of oil and gas, for electricity generation, and for building heat. Well testing and other types of flaring also burn natural gas, gas liquids and oil carryover, creating black smoke that can travel for miles. Large quantities of nitrogen oxides are emitted from these sources. Most of these emissions consist of nitric oxide (NO).

In all regions, diesel engines are used for generating power for towns and cities. Oxides of nitrogen are major pollutants. Particulate matter, carbon monoxide and some sulfur dioxide are also emitted. Asphalt plants operate each summer at temporary and permanent locations in the state. Baghouses or high efficiency scrubbers remove most of the particulate matter.

2. Summary of Major Emitting Facilities

TABLE IV.D.2-1
MAJOR AIR POLLUTION-EMITTING FACILITIES IN ALASKA-
CALENDAR YEAR 1978

| PARTICULATES | TONS/YR |
|---|---|
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 3252 |
| Golden Valley Electric Association, Healy | 2200 |
| Louisiana Pacific, Ketchikan Pulp Co. | 1795 |
| Union Chemicals Division, (Collier Carbon) | 1246 |
| Fort Wainwright | 992 |
| Municipal Utilities System, Fairbanks | 352 |
| Clear Missile Early Warning Site | 225 |
| GVEA, North Pole Units | 103 |
| Chugach Electric Association, Beluga Station | 100 |

| SULFUR DIOXIDES | TONS/YR |
|---|---|
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 2989 |
| Louisiana Pacific, Ketchikan Pulp Co. | 1454 |
| Municipal Utilities System, Fairbanks | 629 |
| Golden Valley Electric Association, Healy | 613 |
| Eielson Air Force Base | 466 |
| GVEA, North Pole Units | 385 |
| Clear Missile Warning Site | 328 |
| University of Alaska Power Plant, Fairbanks | 239 |
| North Pole Refining | 109 |

| OXIDES OF NITROGEN | TONS/YR |
|---|---|
| Union Chemical Division, (Collier Carbon) | 7690 |
| Chugach Electric Association, Beluga Station | 2926 |
| ARCO, Central Compressor Plant, Prudhoe Bay | 2453 |
| Shemya Air Force Base | 2051 |
| Phillips Petroleum Company, LNG Plant | 1628 |
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 1608 |
| GVEA, North Pole Units | 1399 |
| Golden Valley Electric Association, Healy | 1329 |
| Louisiana Pacific, Ketchikan Pulp Company | 1214 |
| SOHIO Central Power Station | 1200 |
| Municipal Utilities System, Fairbanks | 1143 |
| Fort Wainwright | 952 |
| Eielson Air Force Base | 918 |
| Kodiak Electric Association | 763 |
| Elmendorf Air Force Base | 757 |
| Alyeska Pump Station 1 | 695 |
| Union Oil Co., Grayling Platform | 685 |
| Shemya Air Force Base | 653 |
| ARCO, King Salmon Platform | 641 |

| CARBON MONOXIDE | TONS/YR |
|---|---|
| Chugach Electric Association, Beluga Station | 815 |
| ARCO, Central Compressor Plant, Prudhoe Bay | 675 |
| Anchorage Light & Power, Ship Creek | 493 |
| Kodiak Electric Association | 464 |
| Shemya Air Force Base | 388 |
| SOHIO, Central Power Station, Prudhoe Bay | 334 |
| GVEA, North Pole Units | 317 |
| Adak Naval Station | 256 |
| Alyeska Pump Station 1 | 204 |

3. Facilities Under Permit

When the 1972 Alaska State Implementation Plan was written, it was estimated that 80 to 100 permits would be issued to owners of facilities capable of emitting 25 tons per year particulate matter or sulfur dioxide or 100 tons per year nitrogen oxides, carbon monoxide or hydrocarbons. During the ensuing six years, 349 applications for permits were processed. Of these, 37 were for petroleum product storage tank farms located in various towns and cities. Since the regulation setting a state ambient air quality standard for hydrocarbons was rescinded by the state in 1974, no permits were issued for this category.

Of the 312 sources which received permits, 42 were for the temporary facilities associated with construction of the Alyeska Pipeline, and 40-45 were issued to small facilities which installed a diesel-electric generator set larger than 250 kilowatt generating capacity. Neither of these source categories had been included in the original estimate.

The 1980 revisions to the regulations eliminated small facilities from requiring a permit. At this time, approximately 120 facilities are under permit.

TABLE IV.D.3-1
NUMBER OF PERMITTED FACILITIES, BY CATEGORIES AND REGION
IN THE STATE OF ALASKA - 1983

| CATEGORY | SOUTHCENTRAL | NORTHERN | SOUTHEASTERN | TOTAL |
|---|---|---|---|---|
| INDUSTRIAL | | | | |
| Asphalt | 17 | 8 | 6 | 37 |
| Oil Industry | 8 | 46 | - | 54 |
| Construction | 2 | 1 | 1 | 4 |
| Forest Products | - | - | 6 | 6 |
| Incineration | 2 | - | - | 3 |
| CITY FACILITIES | 3 | 1 | - | 3 |
| POWER/HEATING | | | | |
| Federal | 4 | 3 | - | 7 |
| Municipal | 3 | 4 | 1 | 7 |
| Institutional | - | 1 | - | 1 |
| Industrial | 4 | 1 | - | 1 |
| TOTAL: | 43 | 63 | 14 | 120 |

Six variances from the Alaska Air Quality Plan are in effect as of November, 1983.

TABLE IV.D.3-2
CURRENT VARIANCES

| | |
|---|---|
| Alaska Lumber & Pulp Co., Inc. | |
| Sitka Pulp Mill | Variance No. 5B |
| Wrangell Lumber Mill | Variance No. 3B |
| Herring Bay Lumber Company | Variance No. 12A |
| Ketchikan Pulp Company | Variance No. 4B |
| Mitkof Lumber Company, Inc. | Variance No. 2D |
| Union Chemicals Division | Variance No. 11B |

None of these variances from emission standards will result in violations of applicable ambient standards. All affected areas have been designated in attainment with particulate matter standards, and none of the variances will interfere with the maintenance of that designation.

Following are brief descriptions of the variances and a discussion of compliance activities:

Alaska Lumber & Pulp Co., Inc. -- Variance No. 5. There are six sources at the pulp mill near Sitka which emit air contaminants subject to the regulations. Three chemical recovery boilers burning red liquor and two power boilers burning oil and wood waste are major sources of both particulate matter and sulfur dioxide. One caustic liquor incinerator is a source of particulate matter.

Recovery Boiler No. 1 is equipped with a wet electrostatic precipitator (hydroprecipitrol) which has reduced particulate matter emissions from approximately 3500 pounds per day to less than 500 pounds per day.

Recovery Boiler No. 2 is equipped with a high efficiency wet scrubber to reduce particulate matter emissions from approximately 3500 pounds per day to less than 700 pounds per day.

Recovery Boiler No. 3 will be equipped with a similar wet scrubber by July 1, 1980, to reduce particulate matter emissions from approximately 5000 pounds per day to less than 1000 pound per day.

Packed towers are utilized on all recovery boilers to recover sulfur dioxide and produce the acid necessary for the pulping process. In 1973-1976, Recovery Boilers Nos. 1 and 2 were in compliance, each emitting approximatly 2300 pounds of $SO_2$ per day. In June of 1977 and 1978 the towers were repacked with more efficient material which probably reduced the emissions of $SO_2$ by 50% or more. To date no source tests have been run to confirm this. Recovery Boiler No. 3 was built in 1975 and emits approximately 275 pounds of $SO_2$ per day. The total emissions from the process are therefore about 10-20% of allowable emissions for $SO_2$.

Power Boiler Nos. 1 and 2 are equipped with high efficiency multiclones to remove soot, ash and sand from the exhausts. This type of control unit is less effective in removing the fine salts which are emitted. In mid-1978, the secondary wastewater treatment plant was started up. The wet sludge from this water pollution control system cannot be disposed of at a landfill, and ALP is attempting to burn it. The material significantly reduced the combustion efficiency of the boilers, increasing particulate matter emissions.

Fuel oil is burned in the boilers to supply the energy required to meet total steam demand. Some of the energy is needed to evaporate the water in the wood waste and the sludge. Sulfur in the oil is converted to sulfur dioxide and emitted at an average rate of about 5500 pounds per day from each boiler. These emissions vary depending upon the quality of fuel oil purchased and the amount burned each day.

The caustic liquor incinerator was installed in 1977 as part of the wastewater treatment program. Particulate matter emissions from this facility are controlled by a combination high efficiency scrubber and mist eliminator to about 40 pounds per day.

On January 22, 1979, Alaska Lumber & Pulp Co., Inc. of Sitka requested that the expiration date of Air Quality Control Regulation Variance No. 5 be extended from 1 July 1980 to 1 July 1984. Following public hearing in Sitka on May 2, 1979, the variance was extended to 30 April 1981 to allow completion of the recovery boiler emission project as previously scheduled, and additional time to evaluate techniques for minimizing the impact of secondary sludge on boiler operation and emissions.

Alaska Lumber & Pulp Co., Inc. -- Six-Mile Mill (formerly Alaska Wood Products) - Variance No. 3. There is one source at this sawmill near Wrangell which emits air contaminants subject to the Alaska Air Quality Control Regulations. The bark and wood waste boiler is a source primarily of particulate matter. The boiler has been repaired and the emission control system replaced. The new control unit has reduced particulate matter emissions from about 3000 pounds per 24-hour day to 1750 pounds per day. Current limited operating hours have reduced emissions to about 750 pounds per day. During winter months, the boiler has been operated at about 10% over design capacity resulting in twice the normal emissions.

One other source of particulate matter at the mill was a tepee burner, which is no longer in use. This source emitted particulate matter at about 5000 pounds per 24-hour day, and was shut down in 1976.

On February 22, 1979, Alaska Lumber & Pulp Co., Inc. requested renewal of Air Quality Control Regulation Variance No. 3. This variance was originally granted for operation of a tepee burner which ceased operation in 1976. The variance, granted on June 27, 1979, allows operation of a wood waste boiler at its maximum designed operating rate of 30,000 pounds steam per hour until the comprehensive program for power generation in Sitka and Wrangell by Alaska Lumber & Pulp Co., Inc. is completed.

The tepee burner emitted approximately 200 pounds particulate matter per hour. At maximum firing rates, the boiler emits about 75 pounds per hour compared with 65 pounds per hour when in compliance. The mill now operates only one shift per day due to limited wood supply and depressed market conditions. Thus daily emissions are about 750 pounds compared with maximum allowable emissions of about 1600 pounds per full operating day. Due to poor market conditions, the mill was shut down in November 1982.

Herring Bay Lumber Company - Variance No. 12. This small sawmill located near Ketchikan has a wood waste burner which emits about 15 tons particulate matter per year, and is not able to comply with visible emission requirements. The U.S. EPA issued a compliance order to the company in September 1975, which recently expired.

On March 23, 1979, Herring Bay Lumber Company requested a variance for operation of the tepee burner. The variance, granted on June 27, 1979, allows operation of the tepee burner until the company can determine the economic viability of the sawmill following settlement of pending legal actions and can implement an alternative method of wood waste disposal.

At normal operating rates, the burner emitted approximately 30 pounds particulate matter per hour. The mill is currently operating at about 10% of normal rate due to limited timber supply, significantly reducing annual emissions if not hourly emissions.

On July 30, 1983, a variance renewal was granted to allow time to search for appropriate landfill or other waste disposal schemes.

Ketchikan Pulp Company - Variance No. 4. There are six sources at the pulp mill in Ketchikan which emit sulfur dioxide and particulate matter. Two power boilers, each burning oil and woodwaste, exhaust through a common stack. Four chemical recovery boilers, each burning red liquor, now also exhaust through a common stack. Originally, each pair of boilers exhausted through separate recovery system stacks.

In June 1978 the recovery boiler particulate matter emissions control project was completed. The system reduced total particulate matter emissions from 7500 pounds per day to less than 200 pounds per day.

Sulfur dioxide emissions from the recovery systems each averaged about 2000 pounds per day, well within the allowable emissions. The new particulate matter control system probably reduced these emissions by an additional 50% or more, but data to confirm this is not available.

The power boilers are equipped with high efficiency multiclones to remove soot, ash and sand from the exhausts. However, this type of unit is not effective in removing very fine particulate matter such as salt. Higher steam and power demands, an increase in wood wastes to be burned, and the wet material from waste water control systems have affected boiler operations and increased emissions from these boilers. The emissions amount to about 9000 pounds per day. One of two additional particulate matter control units was installed during 1979. These units will remove much of the larger particles of ash, increasing the efficiency of the multiclones. Particulate matter emissions are expected to be less than 3500 pounds per day when this project is completed in early 1980.

Sulfur dioxide is produced by combustion of fuel oil in the power boilers. Average emissions of about 6000 pounds per day vary with the sulfur content of the oil and the quantity of oil burned.

The original variance was granted in 1975 to allow for design and installation of the recovery boiler emissions control system and improved control of the wood waste boilers. The recovery boiler control project is completed, but increased wood waste burning, the addition of primary clarifier wastes, overloading of the new multiclones and increased steam demand make compliance with particulate matter emission standards more difficult. On May 1, 1979, Ketchikan Pulp Company requested a ten month extension of the variance to install new soot-blower mechanisms and the second primary particulate control unit. An additional three years was also requested to study the impact of secondary wastewater treatment plant sludge on boiler operation and to take any necessary control measures needed. In 1979 a variance was granted to allow Ketchikan Pulp to complete these projects.

Current emissions of particulate matter at maximum production rates are approximately 520 pounds per hour. By April, 1980, emissions will be further reduced to about 160 pounds per hour. No estimate of the possible increase in emissions due to secondary sludge is available.

Mitkof Lumber Company, Inc. - Variance No. 2. The only source of concern at this Petersburg sawmill is the wood waste burner. Between 1972 and 1976, the original tepee burner was repaired and modified. However, the visible emissions from the burner were not sufficiently controlled. In 1976 a refractory brick silo burner was installed which maintains a much higher temperature and has improved combustion. Estimated particulate matter emissions were reduced from 6-10 tons per year to 3-5 tons per year. In 1979, Mitkof Lumber Company requested a variance extension to complete modifications improving combustion efficiency and to allow sufficient time to develop alternative methods for disposing of wood wastes. The rebuilt burner has a greater capacity for fuel, improved air supply and distribution and additional fuel oil burners. The variance, granted on June 27, 1979, allows visible emissions in excess of those specified in 18 AAC 50.050(a) during startup and burndown.

The burner emits about 5-20 pounds particulate matter per hour depending on the type and quantity of fuel burned and the combustion air flow. Visible emissons are within the standards about 80% of each operating day, exceeding the standards for 30 to 40 minutes at startup and burndown. However, particulate emissions may not increase during these periods. The change in visibility reduction may result from a lower air flow and condensing water vapor as the exhaust air cools down.

On July 29, 1983, Mitkof was granted a three year extension to explore their proposal to build a new mill.

Union Chemicals Division, Union Oil Company of California (previously known as Collier Carbon and Chemical Corp.) - Variance No. 11. The urea prill tower at the original Kenai plant is a source of particulate matter. The plume of very fine material exceeds visible emission standards. Changes in operating conditions reduced emissions by 20% in 1976, but did not achieve compliance with opacity requirements.

Union Chemicals Division, Union Oil Company of California requested and was granted on June 22, 1979, an extension of Air Quality Control Regulation Variance No. 11 from 30 October 1979 to 30 October 1982. The extension allowed the continuation of testing programs to develop a control system to reduce particulate matter emissions from the urea prill tower and comply with visible emission requirements. During this time, a scrubber was added to the prill tower inlet stream from the crystal drier. This action resulted in a reduction of the prill tower emission rate from 260 pounds per hour to 120 pounds per hour. However, the visible emissions from the tower still are above the regulation, in spite of a relaxation of the standard for the prill tower from 20% opacity to 30% opacity in 1982.

Consequently, Union Chemicals requested and was granted on November 18, 1982, a second extension of Variance No 11 to October 30, 1985. The variance places a limit of 55% opacity on the urea prill tower exhaust. The compliance schedule emphasizes changes in production and operations, instead of the addition of expensive control equipment, to achieve the opacity limits. Union Chemicals is exploring the various parameters such as melt temperature, prill rate, and ambient air temperature, and how they relate to the opacity levels from the prill tower.

The source is presently in compliance with the particulate matter emission concentration standards. Allowable emissions are about 200 pounds per hour, and current emissions are about 120 pounds per hour.

E. POINT SOURCE CONTROL PROGRAM

1. Introduction

The department maintains control of air pollutant emissions of new or modified sources of pollution by review of proposals submitted for analysis. At that time, a determination will be made whether a permit must be issued as required by 18 AAC 50.300.

The State Air Quality Control Permit to Operate system, in existence since 1972, covers new and existing facilities by:

- Preconstruction design review and issuance of a Permit to Operate. This includes departmental assistance to applicants to ease their fulfilling application and data submittal requirements as quickly as possible, and to make certain the proposed undertaking can comply with air quality requirements before a permit is issued.

- Once a permit has been issued, source surveillance and periodic inspection is done by departmental field personnel, to assist source operators in maintaining compliance with air quality requirements. Specific operating conditions and requirements are identified as permit conditions, which are used as the basis for subsequent inspections.

- As inspections and surveillance indicate operating problems needing correction, permit conditions are modified to re-establish compliance as soon as reasonably possible. Depending on circumstances, compliance schedules may be attached as conditions to permits.

The State has by regulation set ambient air quality standards to protect the public health and welfare. Emission standards encourage proper operation and maintenance of equipment, require effective emissions control technology, and minimize ambient air quality effects of stationary sources, but allow industrial growth. The Permit to Operate system, established through 18 AAC 50.300 and 18 AAC 50.400, is one of the means to assure compliance with standards.

The 1980 and 1982 revisions to the Air Quality Control Regulations 18 AAC 50:

- incorporated Federal New Source Performance Standards (NSPS) and Prevention of Significant Deterioration Regulations (PSD) so the State can administer these mandatory programs, reducing the number of governmental entities to which the source owner is responsible;

- reduced the number of facilities requiring permits to large facilities whose impact is of concern, facilities which require emission control equipment to comply, and facilities subject to NSPS and PSD review.

- simplified the permit requirements to require only testing, monitoring, data gathering and reporting necessary for assurance of continued compliance with air quality standards and increments and emission standards;

- incorporated the changes made to the PSD program as a result of successful lawsuits against the regulatory interpretation of the PSD section of the Clean Air Act; and

- added the nonattainment area permit program, and added the visibility regulations protecting Class I areas and other designated areas from visibility degradation.

Section IV.F.1 includes a list of who needs a permit from the Department and what is to be contained in an application.

Section IV.F.2 describes the permit application procedures. Included are copies of the basic permit application, a detailed list of the information necessary to completely describe the facility, and a discussion of additional information which may be required such as ambient air monitoring. This does not include applicants subject to PSD review.

Section IV.F.3 describes the extensive information required from an applicant subject to review under Prevention of Significant Deterioration.

Section IV.F.4 describes the additional information needed from an applicant subject to the provisions of nonattainment pollutant control.

Section IV.G.1 describes the departmental procedures for reviewing a permit application.

Section IV.G.2 discusses the monitoring and testing required to be gathered for preparing a permit application.

Section IV.G.3 describes the Department's program to administer the Prevention of Significant Deterioration (PSD) requirements of the Clean Air Act through the State's Permit to Operate system.

Section IV.G.4 describes the Department's program to issue the permits for those facilities wishing to locate in a nonattainment area listed in 18 AAC 50.021(a).

Section IV.G.5 describes the Department's New Source Performance Standards (NSPS) program. These standards are mandatory federal emission requirements for certain new or modified sources. Specific monitoring, testing, and record keeping requirements are also included in these regulations.

Section IV.G.6 describes the Department's visibility review for the areas designated as sensitive to visibility impairment.

Section IV.G.7 discusses the procedures for handling sources still under EPA regulation.

Section IV.H describes the permit issuance procedures. A standard permit is presented. Also included are categories of information from which reporting requirements appropriate to each specific facility will be determined. An example of a permit attachment is given which describes the reporting requirements of a complex facility.

## F. PROJECT REVIEW PROCEDURES

This subsection defines the types of facilities that require an Air Quality Control Permit to Operate and describes the application procedures. There are three types of permit review and the application requirements vary depending on the magnitude of the net emission change associated with the addition or modification of a source and where it is located. The three levels of permit review are listed in the table below. The table also provides a reference to the sections of the regulations that define permit applicability criteria and permit application requirements.

| Review Procedures | Source Applicability | Permit Application Requirements |
|---|---|---|
| Standard | 18 AAC 50.300(a)(1)—(4) | 18 AAC 50.300(b) |
| Prevention of Significant Deterioration | 18 AAC 50.300(a)(5)—(6) | 18 AAC 50.300(b)<br>18 AAC 50.300(c)<br>18 AAC 50.300(g) |
| Nonattainment Area Review | 18 AAC 50.300(a)(7) | 18 AAC 50.300(b)<br>18 AAC 50.300(d) |

As noted in the table, the standard permit requirements are also the baseline requirements for PSD and nonattainment area reviews. However, a facility that does not require a standard permit is not necessarily exempt from PSD or new source review requirements for nonattainment areas. This is especially true for modifications to existing facilities. All three sets of applicability criteria should be tested to determine if a permit is required to construct, modify or operate a facility with an air contaminant source.

Even if a facility with an air contaminant source does not require a permit, it must be operated in compliance with one or more of the following emission limits:

- 18 AAC 50.050(a) - Exhaust opacity levels of exhaust
- 18 AAC 50.050(b) - Particulate matter levels of exhaust
- 18 AAC 50.050(c) - Sulfur dioxide emissions
- 18 AAC 50.050(f) - Control of fugitive dust
- 18 AAC 50.090 - In areas of potential ice fog, water emissions must be reduced (required at the Department's discretion)
- 18 AAC 50.100 - Excessive air pollution prohibited

1. **Who Needs a permit**

An Air Quality Control Permit must be issued and in effect for construction, modification, or operation of a facility with one or more air contaminant sources described in the following list:

- any source which requires an air contaminant emission control unit or system to comply with emission standards set by 18 AAC 50.040—18 AAC 50.060, and
  - is an industrial process with a total design rate, capacity, or through-put greater than five tons per hour and physically or chemically treats the material; or
  - is fuel-burning equipment with a rating of 50 million Btu per hour or more;
- fuel-burning equipment rated at 100 million Btu per hour or more;
- an incinerator rated at 1,000 pounds per hour or more;
- municipal wastewater treatment plant sludge incinerator serving 10,000 or more persons and burning waste containing more than 10 percent wastewater treatment plant sludge by dry weight
- coal preparation plant installed or modified after November 1, 1982
- portland cement plant installed or modified after November 1, 1982
- asphalt plant
- petroleum refinery installed or modified after November 1, 1982, and containing a catalytic cracking unit regenerator of any size or a sulfur recovery plant rated at more than 20 long tons per day (any petroleum refinery with equipment meeting the criteria for fuel burning equipment or an industrial process as defined above will require a permit regardless of installation date).

The Prevention of Significant Deterioration (PSD) program is required by federal law and is designed to prevent serious degradation to air quality in areas that currently enjoy clean and healthful air. The Department of Environmental Conservation administers the PSD program in Alaska through its own regulations. An application for an Air Quality Control Permit to Operate must satisfy the PSD application requirements if a facility meets any of the following criteria:

- a facility listed in 18 AAC 50.300(a)(5) with allowable emissions of
  - 100 tons per year or more of an air contaminant regulated under the Clean Air Act, as amended August 7, 1977, is installed after November 1, 1982, and is listed in 18 AAC 50.300(a)(5)(A);
  - less than 100 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 100 tons per year or more;
  - greater than 100 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent PSD permit issued to the facility, causing an increase in actual emissions equal to or exceeding the PSD significant emission rates listed in 18 AAC 50.300(a)(6)(C)(i) — (xviii);
- a facility not listed in 18 AAC 50.300(a)(5) with allowable emissions of
  - 250 tons per year or more of an air contaminant regulated under the Clean Air Act, as amended August 7, 1977, and is installed after November 1, 1982;
  - less than 250 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 250 tons per year or more; or
  - more than 250 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent permit issued to the facility under 18 AAC 50.400(c)(3), causing an increase in actual emissions equal to or exceeding the limitations set in 18 AAC 50.300(a)(6)(C)(i) — (xvii):

The determination of whether or not a facility is subject to the PSD provisions in the regulations depends on the amount of "allowable emissions." "Allowable emissions" means the calculated emission rate of a source or facility using the maximum rated capacity and enforceable limits and conditions on emissions or operations. For example, the allowable sulfur dioxide emissions from an oil-fired boiler would be calculated based on the boiler firing capacity and the heating value and maximum sulfur content of the available fuels. Permit restrictions on the maximum sulfur content in the fuel oil or the annual hours of operation would result in a lower value for allowable emissions.

Fugitive emissions must be included in the calculation of allowable emissions for certain source categories. Fugitive emissions are those emissions which cannot reasonably pass through a stack, vent or other functionally equivalent opening. Common examples include dust generated by traffic on unpaved roads, dust from strip mining activities, and combustion products from open burning.

Fugitive emissions must be included in the calculation of allowable emissions for any facility listed in 18 AAC 50.300(a)(5)(A) or any facility that, as of August 7, 1980, is regulated under section 111 (New Source Performance Standards) or section 112 (National Emission Standards for Hazardous Air Pollutants) of the Clean Air Act. A complete list of source categories for which fugitive emissions must be included in the calculation of allowable emissions is contained in Table IV.F.1-1.

The requirements and review procedures are more rigorous for the construction or modification of a major source or facility in the Anchorage urban area or the Fairbanks/North Pole urban areas that are in violation of the ambient air quality standards for carbon monoxide. The construction or modification of a source or facility which will cause actual or allowable carbon monoxide emissions to increase by more than 100 tons per year requires a Permit to Operate and must be reviewed under the Nonattainment Area Review Procedures.

A permit is also required for the operation of a source or facility for which the owner or operator has requested that the department approve limits on emission rates or operations to reduce emissions to levels below those specified in 18 AAC 50. As an example, assume the estimated emissions from a new unit operating continuously at full capacity would trigger a PSD review. The owner only plans on operating the unit seasonally for three months a year. If emissions based on three months of continuous operation are less than the emission levels specified in 18 AAC 50.300(a)(5) or (6), then the owner could apply for a standard permit with a restriction limiting the facility to three months of operation annually. A PSD permit application would not be required.

Table IV.F.1-1

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS
MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

Estimates of allowable emissions from a new or modified facility belonging to a source category on this list must include fugitive emissions (those emissions which cannot reasonably pass through a stack, chimney, vent or other functionally equivalent opening) when determining if the facility is subject to PSD review.

fossil fuel-fired steam generating unit or steam electric plant of more than 250 million BTUs per hour input

fossil fuel-fired boiler or a combination of boilers totaling more than 250 million BTUs per hour heat input

fossil fuel- and wood residue-fired steam generating unit capable of firing fossil fuel at a heat input rate of more than 250 million BTUs per hour

electric utility steam generating unit capable of firing fossil fuel, either alone or in combination with any other fuel, at a heat input rate of more than 250 million BTUs per hour

electric utility combined cycle gas turbines capable of firing fossil fuel in the steam generator at a heat input rate of more than 250 million BTUs per hour

petroleum refinery

incinerator capable of charging more than 50 tons of waste per day

sulfur recovery plant

sewage sludge incinerator burning waste which is more than 10 percent sewage sludge (dry basis) produced by a municipal sewage treatment plant or charging more than 2205 pounds of municipal sewage sludge per day

petroleum storage vessel with a total storage capacity exceeding 65,000 barrels and constructed after June 11, 1973; or exceeding 40,000 barrels and constructed since March 8, 1974; or any petroleum storage and transfer facility with a total storage capacity exceeding 300,000 barrels, regardless of construction date

coal preparation plant

coal cleaning plant with thermal dryers

kraft pulp mill

portland cement plant

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS
MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

primary zinc smelter

iron and steel mill plant

primary aluminium ore reduction plant

primary copper smelter

hydrofluoric, sulfuric, or nitric acid plants

lime plant

coke oven battery

carbon black plant (furnace process)

primary lead smelter

fuel conversion plant

sintering plant

secondary metal production plant

chemical process plant

taconite ore processing plant

glass fiber processing plant

charcoal production plant

asphalt concrete plant

brass and bronze ingot production plant

phosphate rock processing plant

wet process phosphoric acid plant

superphosphoric acid plant

diammonium phosphate plant

triple superphosphate plant

granular triple superphosphate storage facility

ferroalloy production facility

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS
MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

steel plant electric arc furnace

glass manufacturing plant producing more than 10,000 pounds of glass per day

grain elevator

stationary gas turbine with heat input greater than 10.1 million BTU per hour

automobile and light duty truck surface coating operation

ammonium sulfate manufacturing plant

beryllium sources including:

- extraction plant
- ceramic plant
- foundary
- incinerator
- propellant plant
- machine shop
- rocket motor test site

mercury sources including:

- mercury ore processing
- mercury chlor-alkali cell
- wastewater treatment plant sludge incinerator or dryer

vinyl chloride sources including:

- ethylene dichloride plant
- vinyl chloride plant
- polymerized vinyl chloride plant

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS
MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

asbestos sources including:

- asbestos mill
- roadway
- manufacturing
- waste disposal (manufacturing, demolition, etc.)
- waste disposal (asbestos mill)
- inactive waste disposal site

2. Standard Application Procedures

An application for an Air Quality Control Permit to Operate is to be submitted to the department for review and approval. The addresses for submittal and phone numbers are listed in Table IV.F.2-1. The application must be signed by a principle or executive officer or a duly authorized representative, general partner, proprietor or publicly elected official.

The Department is responsible for granting or denying a permit for which an application is made within thirty days following receipt of the complete application. A summary of the basis for issuing or denying a permit will be completed for each application. If additional information is required for review of an application, the department will specify to the applicant the information required, and establish a date by which the information should be received. The time for review of the permit application will be held in abeyance during this period.

The owner/operator of a facility which requires a permit to operate is to submit the permit application to the appropriate Regional Environmental Supervisor. Assistance in understanding the requirements and obtaining supporting data may be obtained through the Department's regional offices, for which addresses and phone numbers are in Table IV.F.2-1.

An application must include the information required by 18 AAC 50.300(b). This section includes what is contained in "INFORMATION REQUIRED -- PERMIT TO OPERATE APPLICATIONS", referenced in FIGURE IV.F-1. For the various classes of emission sources, data is to be provided for each unit and emissions point (stack or vent). If routine variations of the process or upset conditions may result in venting, flaring or other major changes in the nature or rate of emissions, the applicant must indicate the cause(s) of the change, the probability or frequency of occurrence, probable duration and estimated quantity of emissions.

For facilities subject to PSD requirements, the information required in 18 AAC 50.300(c) and as discussed in Section IV.F.3 must also be included. For facilities proposing to locate in a nonattainment area, the information required in 18 AAC 50.300(d) and as discussed in Section IV.F.4 must also be included.

For a new or modified facility, the information to describe the operation may be submitted in a letter or attached to a signed copy of the one page application form shown in Figure IV.F.2-1.

Renewal of a permit must be requested at least thirty days prior to the expiration date, to provide for expeditious reissuance of the permit. A letter requesting renewal and listing all changes made since the previous application is needed.

Amendment of a permit is required if a change in operation or the process occurs, or if a control system is to be slightly modified or replaced. A new permit is required when adding new units of any size to a facility under existing permit, or making modifications to a unit for which the expenditures exceed 50% of the original capital cost of the unit.

TABLE IV.F.2-1

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OFFICES TO SUBMIT AIR QUALITY CONTROL PERMIT APPLICATIONS

An application should be submitted to the appropriate regional office of the Department.

Regional Environmental Supervisor
Southeast Regional Office
P.O. Box 2420
Juneau, Alaska 99803
(907) 789-3151
Telex (099) 45-378, ADEC-JNU

Regional Environmental Supervisor
Northern Regional Office
P.O. Box 1601
Fairbanks, Alaska 99707
(907) 452-1714
Telex (090) 36-608, ADEC-FBX

Regional Environmental Supervisor
Southcentral Regional Office
437 "E" Street, Second Floor
Anchorage, Alaska 99501
(907) 274-2533
Telex (090) 25-421, ADEC-AHG

Information and technical assistance may also be obtained from:

| | |
|---|---|
| Air Quality Control Section, Juneau | 465-2666 |
| Ketchikan Field Office | 225-6200 |
| Sitka Field Office | 747-8614 |
| Soldotna Field Office | 262-5210 |
| Wasilla Field Office | 376-5038 |
| Valdez Field Office | 835-4698 |

FIGURE IV.F.2-1

ALASKA DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Date received ____________
File number ____________

APPLICATION FOR
AIR QUALITY CONTROL PERMIT TO OPERATE

I. FIRM NAME ____________________

Address ____________________

____________________ Telephone No. ____________

LEGAL OWNER ____________________

Address ____________________

____________________ Telephone No. ____________

II. NAME OF FACILITY:

III. LOCATION OF FACILITY:

IV. NATURE OF OPERATION (Include type of product, production rate, size and history of facility, listing the units having air contaminant emissions and control equipment type and efficiency):

V. LIST OF ATTACHMENTS (Include all information needed to fully describe the facility as outlined in INFORMATION REQUIRED. Identify all attachments and reference material to be included as part of this application:

VI. CERTIFICATION STATEMENT: I certify under penalty of perjury that to the best of my knowledge all of the above information and attachments are true and correct.

____________________ SIGNATURE

____________________ DATE

____________________ TITLE

a. Information Required

The information requested here will generally be adequate as a request for a determination of whether the facility requires a permit. If the facility is subject to Prevention of Significant Deterioration or nonattainment area review, additional information as described in 18 AAC 500.300(c) and (d) will be needed. Depending on the type of facility, one of the following three sections must be filled out.

STANDARDIZED SOURCE

Examples: asphalt plant, diesel engine, gas turbine, incinerator, or similar off-the-shelf unit with standard emission control system(s).

1. type of unit and location

2. rated capacity

    a. if fuel burning: Btu/hr maximum rating, type of fuel and maximum fuel burning rate in pounds, gallons or cubic feet per hour.

    b. if process unit: type of material and maximum rate processed or produced in appropriate weight units, gallons or cubic feet per hour.

    c. if waste burning: type of waste(s) burned, maximum rate in gallons or pounds per hour, type and quantity of auxiliary fuel burned.

3. normal operating schedule

    a. hours/day
    b. days/week
    c. days or weeks/quarter

4. control system(s) installed

    a. type and size (capacity)
    b. efficiency (%)
    c. estimated emissions rates of regulated pollutants

        particulate matter -- lb/hr
        sulfur dioxide -- lb/hr
        nitrogen oxides as $NO/NO_2$ -- lb/hr
        carbon monoxide -- lb/hr

5. stack parameters

    a. height (feet)
    b. diameter (feet)
    c. temperature (°F)
    d. flow rate (acfm, scfm)

SPECIALIZED/LARGE FUEL-BURNING OR INCINERATION SOURCE

1. type of unit

2. type(s) of fuel(s), source of supply, type of waste(s), auxiliary fuel

3. heat content of fuel, Btu/lb, /gal or /$ft^3$

4. sulfur content of fuel, %

5. ash content of fuel, %

6. ash content of unit -- Btu/hr, lb waste/hr, /lb, /gal or $ft^3$/hr

7. fuel consumption -- normal and maximum

8. use of heat

   a. power generation - %
   b. process heat - %
   c. space heat - %

9. normal operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

10. control system(s)

    a. type and size (capacity)
    b. efficiency
    c. control/operating parameters, auxiliary fuel
    d. estimated/actual emissions rates of regulated pollutatnts (indicate whether the rate is based on emission factors, tests or material balances)
       particulate - lb/hr and tons/year
       sulfur dioxide - lb/hr and tons/year
       nitrogen oxides as NO/$NO_2$ - lb/hr and tons/year
       carbon monoxide - lb/hr and tons/year
    e. by-pass or upset conditions, controls (such as flares), frequency of occurence

11. monitoring system(s)

    a. type
    b. location
    c. sampling/testing procedure proposed in lieu of continuous monitoring

12. stack and exhaust parameters

    a. height (feet)
       carbon monoxide - ppm
       particulate matter - grams/scf

PROCESSING SOURCE (not otherwise covered above, including material storage/handling)

1. type of process or treatment

2. type of unit

3. rate of processing, treating or transferring; pounds, gallons or cubic feet, processed, treated, pumped, converted or produced per hour

4. size of storage tanks(s), vessels, type(s) of material stored, vapor pressure

5. operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

6. control system(s)

   a. type and size (capacity)
   b. efficiency
   c. control/operating parameters
   d. estimated/actual emissions rates of regulated pollutants (indicate whether the rate is based on emission factors, tests, or material balances)
      particulate matter - lb/hr
      sulfur dioxide - lb/hr
      nitrogen oxides - lb/hr $NO/NO_2$
      hydrocarbons - lb/hr
      carbon monoxide - lb/hr
   e. by-pass, venting or other upset conditions, controls, probable frequency

7. monitoring system(s)

   a. type
   b. location
   c. sampling/testing procedure proposed in lieu of continuous monitoring

8. stack and exhaust parameters

   a. height (feet)
   b. diameter (feet)
   c. temperature (°F)
   d. flow rate (acfm and scfm)
   e. concentration of regulated pollutants

In addition to the above information, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

° installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;

b. Additional Considerations

In addition to the information requirements contained in section a, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

- installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;
- use of water or chemicals for dust control in the demolition of existing structures, construction operations, road grading, or land clearing; and
- application of asphalt, oil, water, or suitable chemicals on dirt roads, material stockpiles and other surfaces which can create airborne dusts.

Stack Injection

The regulations allow for injection of materials into exhaust streams other than for pollution control only with written approval from the department. It is the intent of the department not to allow such practices unless it is the most environmentally sound procedure for disposal of the material. The applicant must prove:

- the combined exhaust can meet emission standards and opacity limitations for that source; this will require an engineering analysis with documentation of similar sources, source tests after installation at maximum operating conditions, and may include continuous emission monitoring;
- the combined exhaust can meet applicable ambient air quality standards and increments; this will require atmospheric modeling to show downwind concentrations with and without the injection material, modeling will be in accordance with established state guidelines;
- the combined exhaust will not cause the downwind concentration of an air contaminant for which no ambient air quality standard is established to exceed a level determined by the department to be injurious to human health or welfare;
- the residence time and stack temperature are sufficient to cause total burning of the material;
- that no other environmentally sound procedure is available such as dewatering and incineration, hauling to a nearby area or treatment facility, or inexpensive further treatment for eventual discharge; and
- the material will not degrade or erode the proposed control equipment.

In addition, the amount and content of injected material from a laboratory analysis is required, along with a rigorous discussion of operating parameters to guarantee the material will be injected at a controlled rate.

## Stack Heights and Dispersion Techniques

The department has promulgated regulations, consistent with the Clean Air Act and federal regulations, which set limits on the use of tall smokestacks and other dispersion techniques in ambient air modeling for the purpose of setting an emission limit or calculating the air quality impact of a source. This may be necessary if a source meets the applicable federal and state emission standards but still poses the potential to cause air quality standards or PSD increments to be exceeded.

The regulations do not limit the physical stack height for any source or the actual use of dispersion techniques. Sources are modeled at their actual physical stack height unless the actual height exceeds the height defined in 18 AAC 59.900(23) as "good engineering practice" (GEP). If the actual stack height is greater than the GEP stack height only the GEP stack height can be used to estimate ambient air contaminant concentrations resulting from emissions from the stack and to establish the emission limit for the source. As of June 1987 there are no sources in Alaska for which stack height needs to be considered in setting the emission limit.

Prior to June 7, 1987, the department's regulations allowed the creditable stack height to be automatically increased to prevent the plume emanating from the smokestack from impacting on hillsides or mountains. The current regulations limit the extent to which dispersion can be substituted for actual emission reductions in order to minimize ambient air contaminant concentrations in these cases.

Stack height is always measured from ground level at the base of the stack or, for a source located offshore, from mean lower, low water. The GEP or maximum creditable stack height can be determined in three ways:

1) any stack up to 65 meters in height can be credited at the full actual height.

2) GEP stack height greater than 65 meters can be calculated by a formula based on the dimensions of nearby buildings:

   GEP stack height = (building height) + [1.5 x (lesser of building height or width)]

   The department may require field studies or computerized fluid model demonstrations to verify that the height allowed by formula is necessary in cases where the formula is suspected to overstate the appropriate stack height credit.

3) GEP stack height greater than allowed by the formula can be established with a computerized model or a field study. The modeling demonstration or field study must show that the additional height is necessary to avoid "excessive concentrations" due to downwash induced by "nearby" buildings, hills or mountains. The department will provide the public with the opportunity to review and comment on any proposal to permit a facility credited for stack height greater than the GEP formula height.

The terms "excessive concentration" and "nearby" used in describing the GEP formula and modeling demonstration have very specific definitions contained in 18 AAC 50.900(20) and (29). A height greater than allowed by the formula may only be credited if the height is necessary to avoid an "excessive concentration" defined as increase in ground-level ambient contamination concentration that

1) is 40 percent greater than the concentration that is predicted to occur without considering the effects of plume downwash, and

2) exceeds an ambient air quality standard or, for sources subject to the PSD provisions, a PSD increment.

The question of whether buildings and features may be considered to account for downwash in the formula or in modeling demonstrations is resolved in the definition of "nearby" [18 AAC 59.900(20)]. For applying the formula, a structure is considered nearby if it lies within a distance from the stack that is equal to five times the lesser demension of the height or width of the structure. The maximum distance to be considered "nearby" is 0.8 kilometer. For modeling demonstrations, a terrain feature farther than 0.8 kilometer from the stack may be considered "nearby" if it meets the criteria in 18 AAC 50.900(29)(B).

For the purpose of increasing the creditable stack height for an existing source to a height greater than that calculated by the formula, the emission rate used in the modeling demonstration must not exceed the emission levels required by federal New Source Performance Standards (NSPS) or to a level representing the lowest feasible emission limit. If the owner or operator of an existing source can demonstrate to the department that it is infeasible to control emissions to NSPS levels, then an alternative limit representing the lowest feasible emission limit must be approved by the department before obtaining credit for stack height in excess of the GEP formula height. Factors such as remaining plant life and the cost of modifying existing equipment may be considered when determining the feasible emission limit.

If the objective is only to increase the creditable stack height for an existing source, up to, but not greater than, the GEP formula height, the emission rate used in the modeling demonstration must be the existing emission limit or the actual emission rate if no limit is specified. For these sources, the definition of an "excessive concentration" can also be met by the actual presence of a local nuisance caused by emissions from the existing stack.

Besides excessive stack height, prohibited dispersion techniques include intentionally varying the emission rate according to weather conditions or ambient contaminant concentrations. There are certain dispersion techniques that can be allowed in establishing emission limits. Generally, techniques which increase the plume rise, such as heating the exhaust gas stream or combining exhaust gases from several existing stacks into one stack, is creditable for sources as long as the sulfur dioxide emissions from the entire facility are less than 5,000 tons per year. For facilities whose sulfur dioxide emissions exceed 5,000 tons per year, certain techniques to increase plume rise may be creditable if they qualify for the prohibition exemptions outlined in 18 AAC 50.900(16)(C)(i)--(iii).

3. PSD Application Procedures

The owner/operator of a source or facility described in 18 AAC 50.300 (a)(5) and (a)(6) is subject to review under the Prevention of Significant Deterioration (PSD) provisions. Due to the length of time and the costs required to prepare an approvable application, the department encourages frequent consultation between the applicant and the department to avoid undue delays which might result from use of inadequate or inappropriate modelling or monitoring procedures.

A full PSD application consists of these major aspects:

° Control technology review/Best Available Control Technology determination.

° Air quality analysis - an analysis of existing air quality and a determination that the applicable ambient air quality standards or increments will not be exceeded.

° Air quality monitoring - up to one year's measurement of appropriate meterological and air quality parameters.

° Additional impact analysis - an analysis of the effect on visibility,

Volatile organic compounds and reduced sulfur compunds are two emissions whose constituency are not inherently obvious. The definition for VOC's is in 40 CFR 60.2, the NSPS definitions as described in the December 24, 1980 Federal Register. VOC's do not include methane and ethane. The complete list of hydrocarbons not included as a VOC is in the September, 1980, document EPA 450/2-77-028 "Procedures for the Preparation of emission Inventories for VOC's "Volume 1, 2nd Edition, pages 2-10 and 2-11. The definition for reduced sulfur compounds is in 40 CFR 60.010(e) (subpart J) Reduced sulfur compounds only include hydrogen sulfide, carbonyl sulfide and carbon disulfide."

Preliminary Report and Meeting

At the earliest date possible and prior to conducting any air monitoring, the applicant is encouraged to submit to the department a preliminary description of the project, and an air quality analysis including recommendation on the need for monitoring various environmental parameters. A monitoring program may follow which can be up to one year's duration. A detailed analysis of the data gathered must be made, and a final report sent to the reviewing agency. The agency will prepare an assessment of the report, provide for public comment, and make its final determination.

The applicant should present a preliminary report which includes:

- a brief description of the project; process data, design parameters, stack heights, diameters, exhaust flow rates, exhaust temperatures, plot plan if more than one stack, a topographic map at least 1:62500 with proposed facilities marked, and the proposed control systems - NSPS requirements if applicable or process-related controls which reduce emissions.

- the results of an in-depth analysis of the increase in total concentration of each pollutant emitted by the facility based on:

  - ° emission data from plant design or source tests.
  - ° available or estimated meteorological data.
  - ° available or estimated air quality data.
  - ° determination of background air quality such as emissions data from other sources or an assumed "background" level.

- the results of calculations of ambient air quality performed for each stability class and a range of wind speeds likely to occur at the site. Ground level concentrations of each pollutant will be determined for the appropriate time periods such as; 1 hour, 3 hours, 8 hours, 24 hours, season and year, out to where the impact is one microgram. This would include a presentation of the maximum ground level concentration calculations, complete with the assumptions used and a description of the conditions needed for the occurrence of these concentrations.

- a summary of the concentration data in appropriate units printed on maps using a 1 km grid. Appropriate wind rose and stability class(es) should be presented on each map. Presentations are needed for conditions which yield a maximum value for each stability class considered, and for 24-hour seasonal, and annual periods.

- a discussion of the applicability and drawbacks of the model(s) used, and limitations of data or assumptions used.

- a recommendation for an air quality monitoring network, including special studies, if appropriate, for preparing a refined analysis of the project.

The owner or operator of a proposed new or modified PSD facility will not be required to conduct air quality monitoring for specific pollutants if one of the following is demonstrated:

° the annual increase in emissions is less than that set in 18 AAC 50.300(a)(6)(C)(i-xvii)

° the concentration of a pollutant in the area of the source is equal to or less than that set in 18 AAC 50.510(b)

° the estimated air quality impact from increased emissions is equal to or less than that set in 18 AAC 50.510(b)

The applicant should send the preliminary report to the reviewing agency and allow at least one week for agency analysis. After initial agency review, a conference (with consultants if possible) to review the project and report with the reviewing agency should be arranged by the applicant.

At this conference the applicant should be prepared to discuss the procedures used for calculating the maximum ground-level concentrations and the models used. Justification of any variance from EPA standard procedures and guidelines must be presented. The effects of associated growth, the various control options for reducing pollution and the need for ambient monitoring will also be discussed. The department will offer technical assistance and recommendations concerning the applicant's plans. However, the applicant will be solely responsible to justify and adequately demonstrate compliance with all PSD requirements.

Based on the meeting with the reviewing agency, the applicant should determine if the work already completed proves the ambient air will not be significantly degraded around the proposed facility. In this case, a final application should be prepared and submitted by the applicant.

Pre-Construction Monitoring

A new or modified facility subject to PSD review must monitor meteorological parameters and existing ambient air quality for up to one year prior to approval of a permit application. The parameters for which monitoring is required will be specified by the department.

Examples include wind direction, wind speed, temperature, sulfur dioxide, particulate matter, ozone, oxides of nitrogen and carbon monoxide, and visibility monitoring. The department will waive this requirement or approve a reduced monitoring program if adequate data is already available, if the proposed site is in an undeveloped area where pollutant levels are below those in 18 AAC 50.510(b), or if the estimated change in air quality is below the levels in 18AAC 50.510(b).

Where ambient monitoring is required the department will establish the size and type of monitoring network after consultation with the applicant. The criteria for determining the type and extent of the monitoring network will include the size, type, and location of the facility, quantity/type of emissions, available PSD increment, and existing data. Basic requirements for an approvable monitoring network are:

- Continuous meteorological stations are required at the proposed facility site and one or more other sites to characterize the meteorology of the airshed.

- Continuous ambient sulfur dioxide monitor(s) are required at the site of the facility and possibly at one or more points which may be affected by the plume if the ambient level of $SO_2$ in the airshed is, or is estimated to be, greater than 13 micrograms per cubic meter for a 24-hour average. A standby monitor or adequate supply of repair parts will be required to assure continuous data acquisition.

- Particulate matter sampling are required at one site using a standard collection device taking a 24-hour sample every three or six days. The location of the monitor will generally be at the site of the facility. Additional monitoring sites may be required, particularly at sensitive sites such as boundaries of Class I areas in vicinity of the project.

- When the facility is located near or within the boundaries of the Municipality of Anchorage or the Fairbanks North Star Borough, one or more continuous monitors may be required to augment the existing monitoring network.

The applicant is to prepare a monitoring program plan and submit it to the reviewing agency prior to implementation. After allowing one week for agency analysis, the applicant should schedule a meeting with the reviewing agency if needed to finalize the following aspects of the proposed program:

Design of Monitoring Network

Site locations; variance from EPA siting criteria
Meteorological monitoring
Pollutant monitoring parameters; justify non-monitoring, short-term monitoring, or intermittent sampling frequency
Quality assurance program; Instrument maintenance
Special studies, such as stability class determinations, plume behavior studies, inversion levels

Upon review and tentative approval by the reviewing agency the applicant should proceed with the setup of a monitoring network. After setup, the applicant is to have an independent group evaluate monitor siting, evaluate instrument calibration, and determine compliance with performance standards. Halfway into the study, the applicant should check all meteorological data to see if additional sites are necessary, discuss with the reviewing agency the information gathered during initial operation of the network, and implement any recommendations.

Near the end of the monitoring study, the applicant should prepare an evaluation of the growth of the community and nearby communities, increased traffic, attraction of other industries, and any other activities which are likely to cause changes in ambient air quality as a result of construction and operation of this facility, and prepare the additional analyses of impacts or visibility, vegetation, soils and terrain. This information should be sent in a draft analysis for review so everyone involved will be satisfied with the final report's completeness. This analysis need not necessarily present results and conclusions. All the information -- except for the final impact analysis -- should be complete, including BACT data.

An outline of how the impact analysis will be presented should be included.

Modelling Procedures

Applicability of the selected model(s) to the project and site
Model validation (using existing sources of pollutants, tracer gas studies, determination of stability classes, inversion levels/ strengths, etc.)
Recording and storage of data
Data handling and submittal

Associated Growth Analysis

This evaluation of the changes in ambient air resulting from associated growth will include the emissions from sources other than from the new or modified facility receiving the permit. These include:

- construction of the facility
- ships, trains, or other material or product transfer schemes
- new or modified offsite support facilities such as power plants
- fugitive emissions from use of roads or material handling
- emissions from small camps or home heating units
- in areas of concern, emissions from mobile sources such as cars and trucks.

The term includes only permanent activities started within one year after completion of the project. However, it does not include a pollutant source whose maximum yearly emissions are less than ten tons per year. Similar pollution categories must be summed to compare to this exemption. Associated growth emissions are not counted as part of the levels that trigger a PSD analysis (such as 100/250 tons). The growth itself may be subject to a separate PSD analysis as in the case of an associated power plant.

Requirements for preparing and submitting a PSD application which are not specified as regulations include the following:

- 40 CFR 51.24 published in Federal Register Vol. 45 No. 154 August 7, 1980, pp. 52676-52784
- EPA-450/4-80-012, November 1980 "Ambient Monitoring Guidelines for Prevention of Significant Deterioration"
- 40 CFR 58 Appendix B "Quality Assurance Requirements for Prevention of Significant Deterioration Air Monitoring"
- EPA-450/4-77-001, October 1977 "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10 (revised), Procedures for Evaluating Air Quality Impact of New Stationary Sources", OAQPS #1.2-029R, October 1977
- OAQPS No. 1.2-080, April 1978 "Guidelines on Air Quality Models"
- OAQPS No.1.2-097, May 1978 "Workbook for the Comparison of Air Quality Models"
- Draft EPA "Guideline for Determining Best Available Control Technology", December 1978
- 40 CFR Parts 60 and 61
- ADEC Ambient Analysis Procedures, Vol. III, State Air Quality Control Plan
- PSD Workshop Manual, October 1980

PSD Application Format

After the monitoring period is over, the applicant is to submit a PSD application for review in this general format:

1.0 SHORT SUMMARY
Scope of project
Result of study, summary of conclusions

2.0 INTRODUCTION
Description of project
How to read rest of book

3.0 DESCRIPTION OF PROJECT
Site location; existing facilities; land use; existing air quality
Environmental setting; power/water availability; topography, meteorology
nonattainment area(s) or Class I areas; other air quality concerns
Process description; plot plans; construction schedule
Type of pollutants; rate of emissions with and without controls
Control equipment; cost; efficiency; energy consumption
Maximum operating design capacity; normal operating rates

4.0 MONITORING AND ANALYSIS STUDY
Pollutants monitored; locations; rationalization for study
Justification for variance from EPA criteria
Maps, graphs or photos of monitoring stations
Quality assurance certification; chain of custody discussion
Instrumentation; Data reporting/handling
Special studies

5.0 ENVIRONMENTAL IMPACT
Comparison with regulations (incremental increases, resulting levels)
Map presentations of results on a grid with wind speeds and stability classes indicated
Discussion of intermittent, seasonal, or temporary operations, upsets
Nonattainment area and/or Class I area impacts
Associated growth
Impact on vegetation, soils, and terrain/impairment of visibility
Upset operations/control, short-term impacts
Solid/liquid effluent from control system

6.0 ALTERNATIVES
Fuel type changes, BACT choices, locations, other processes
Not building at all, socio-economic impacts of non-action

7.0 CONCLUSIONS
Detailed discussion and summary
Proposal for post-construction monitoring/modeling

8.0 APPENDIX
Data, references, regulations, parties involved

4. Nonattainment Application Procedures

New or existing sources of a pollutant not in attainment with ambient air standards that wish to increase emissions of that pollutant in a nonattainment area must obtain a permit from the department. This permit will contain conditions which will prevent growth in the area's emissions of the nonattainment pollutant that would delay the attainment date. A permit is required for a source or facility installed, reconstructed or modified after July 1, 1979, or after the date of the most recent nonattainment permit issued to the facility since July 1, 1982, located in a nonattainment area, and causing an increase in actual or allowable carbon monoxide emissions, whichever is greater, of 100 tons per year or more (18 AAC 50.300 (a)(7)).

The application for the proposed facility must contain the standard information listed in 18 AAC 50.300(b) and the requirements in 18 AAC 50.300(d). The application is to contain proof the lowest achievable emission rate for the nonattainment pollutant (18 AAC 50.300(d)(1)) will be used. This is defined as "that rate of emissions which reflect the most stringent emission limitation of any state, or any emission control which has been achieved in practice by comparable sources." The application must also show the emissions for the nonattainment pollutant will not exceed the applicable emission allowance (18 AAC 50.300(d)(1)).

The term "emission allowance" means, for each nonattainment pollutant, the amount of air contaminant emissions allowed from new or modified facilities, as defined in each applicable local air quality control plan, which will not interfere with attainment of ambient air quality standards. In addition, other sources owned or operated by the applicant (or by any entity controlling, controlled by, or under common control with such person) in the state must be in compliance with requirements of the Clean Air Act as amended August 1977 and state air regulations (18 AAC 50.300(d)(2)).

Facilities near a nonattainment area

If an applicant proposes to build a facility or modify an existing facility and the location is near a non-attainment area, an analysis is needed to show that the pollution will not prevent or interfere with the attainment of the ambient air standard currently not in attainment (18 AAC 50.400(c)(1)).

For facilities subject to PSD analysis, they would need to show the increase within the nonattainment area is less than 500 micrograms per cubic meter for an eight-hour average and less than 2000 microgrms per cubic meter for a one-hour average. For facilities not subject to PSD, a similar analysis may be necessary if the increased emissions are estimated to be greater than 100 tons per year.

## G. APPLICATION REVIEW AND PERMIT DEVELOPMENT

### 1. Application review

The ADEC Operations Division or Air Quality staff shall:

- Obtain emissions data, facility design, proposed emission control system, and the exhaust point conditions from the applicant's Air Quality Control Permit to Operate Application and attachments.

- Confirm the applicability of 18 AAC 50, NSPS, or NESHAPs, and for those facilities subject to State review, estimate the total annual controlled and allowable emissions using AP-42 or other applicable emission factors for comparison with the applicant's estimates.

  If the facility is modified, determine the current allowable emissions and the net change in actual emissions from the facility of each type of pollutant and compare them to the levels in 18 AAC 50.300(a)(5), (a)(6) and (a)(7). A net change results from the decreases in actual emissions from existing sources and the increases in allowable emissions from new or modified sources. Credits from decreases can only be given to the same pollutant. No credit can be given for decreases from current active emissions to current allowable emissions. If an existing source in a NSPS category is reconstructed, it shall be subject to the NSPS regulation irrespective of any change in emissions.

  - If the regulations are not applicable and the design is adequate to meet visibility and emissions standards specified in 18 AAC 50, notify the applicant in writing a permit is not required and the facility appears designed to comply with applicable emissions regulations.

  - If the change in emissions does not subject the facility to PSD or nonattainment area permit review, determine applicability of 18 AAC 50.300 and issue an Air Quality Permit to Operate as appropriate, following the remaining steps described in this section.

  - If the change in emissions does subject the facility to PSD review, notify the applicant of this determination and follow the procedures in Section IV.G.2.

  - If the increase in emissions does subject the facility to nonattainment area review, notify the applicant of this determination and follow the procedures in Section IV.G.4.

- Evaluate the control system design to determine if the facility complies with applicable 18 AAC 50, NSPS, or NESHAPs emissions concentrations/rate requirements. If the facility is subject to PSD review, determine if adequate justification has been presented that the best available control technology has been proposed to reduce emissions of each pollutant. If the facility is located in a nonattainment area, determine if technology has been proposed to control the nonattainment pollutant to the lowest achievable emission rate.

  - If the design or control system is inadequate, write a "Certified Mail Return Receipt Requested" letter to the applicant citing the reasons ADEC feels the facility cannot comply with regulations. Request source tests or other data from equivalent or similar facilities to determine the capacity of the proposed source to comply with applicable requirements. It is not necessary to deny the application at this time.

- If the facility design is adequate perform the impact review.

° Evaluate the impact on ambient air quality to determine what incremental increase of each pollutant might be attributed to the source. Compare this evaluation with the results of the applicant's analysis.

  - For most facilities, the analysis procedures as described in the Appendix are sufficient.

  - For facilities located in complex terrain, in areas with a number of other facilities, in or near a Class I area, near a nonattainment area or in areas where the remaining increment is small, sophisticated modelling may be required. The review will make sure the analysis supplied by the applicant is appropriate to the source and location, the input data is accurate and representative, the modelling procedure is applicable, and all assumptions and procedures are justified. Independent modeling analyses should be performed to compare with the results of the applicant's studies.

Impacts upon ambient air quality standards or increments are to be assessed through the utilization of air quality models, data bases and other techniques presented in the "Ambient Analysis Procedures" found in the Appendix.

Based on the conclusion the facility is capable/incapable of complying with all applicable standards and increments, the review staff shall send an analysis describing the basis for recommending approval/disapproval of the project to the permit signer.

° Approve: Write an Air Quality Control Permit to Operate. Include requirements for appropriate stack or ambient monitoring and reporting to ensure compliance with emissions regulations, ambient air quality regulations, and to measure the incremental change in ambient air quality.

  If additional information is required to complete the review of an application, prepare a brief informative summary of the department's analysis of the application for publication in a newspaper of general circulation in the area affected by the proposed project. The announcement should describe the department's preliminary determination of the acceptability of the application, invite written public comment, and provide opportunity to request a public hearing. If a hearing is requested, it will be held in accordance with applicable statutes and regulations.

° Disapprove: Write a Certified Mail Return Receipt letter disapproving the application and prohibiting operation. State the reason(s) for the denial. Notify the applicant of his rights to an adjudicatory hearing as required in 18 AAC 15.

2. Permit Development Requirements

## Monitoring and Testing Requirements

Ambient air monitoring, emissions monitoring, and source testing, when necessary to assure compliance with emission regulations, New Source Performance Standards or meet the Prevention of Significant Deterioration (PSD) requirements, will be specified as conditions of the Permit to Operate for that facility. This section describes the requirements and conditions under which monitoring and testing will be specified in a permit.

The applicant may be required to establish and operate one or more ambient monitoring sites to predict and monitor the impact of the facility on ambient air quality, and install and operate continuous monitors to measure the concentration of pollutants in the exhaust stack or other parameters related to operation of an emissions control system. Source tests will usually be required to certify or verify compliance and may be required on a routine basis when continuous data is unavailable.

### Ambient Monitoring

In addition to possible pre-construction monitoring, the applicant may need to monitor meteorological parameters and ambient air quality during construction and for up to three years following startup. For facilities proposing to locate near an area listed in 18 AAC 50.021(c), monitoring of natural conditions and of any change in existing conditions may be required.

If the facility is projected to cause an impact greater than the levels listed in 18 AAC 50.510(b), ambient monitoring will be required to confirm the applicability of the modelling procedure. Normally, measurable impact will be considered to be 30% or more of an available increment or 5% or more of the air quality standard being exceeded.

The monitoring network may be revised, reduced or eliminated after evaluation of the data collected during the period following the startup of the new or modified facility. Instruments, siting, operation, calibration, and data reduction shall be in accordance with:

- U.S. EPA designated reference and equivalent methods and quality assurance requirements in 40 CFR 50, 40 CFR 53, and 40 CFR 58 (Appendices B and E)

- EPA - 450/4-80-012 November 1980, "Ambient Monitoring Guidelines for Prevention of Significant Deterioration"

- ADEC Air Quality Monitoring System Guidelines for Quality Control

- ADEC Procedures for Reporting Ambient Air Quality and Meterological Data

### Continuous Emissions Monitoring

The Department may require facilities under permit to monitor exhaust emissions or other parameters to determine compliance with New Source Performance Standards, other emission standards, or to determine the operating efficiency of control systems. The Department will specify the parameters to be monitored based on the source category, pollutant control system, ambient air quality, applicability or usefulness of the data, and pertinent regulations. The parameters are listed below in three groups - exhaust characteristics, process parameters and others. Examples of monitoring requirements for specific source categories are given with the conditions to be considered in determining which requirements are applicable.

A facility under permit may be required to install, calibrate, maintain and operate one or more continuous monitoring instruments in the exhaust stack(s). The parameters for which the department will require monitors will be specified in the permit. Examples include:

- opacity (transmissivity)
- sulfur dioxide
- nitrogen oxides ($NO/NO_2$)
- oxygen
- carbon dioxide
- temperature
- flow rate

A facility under permit may be required to install, calibrate, maintain and operate one or more continuous or totalizing instruments to measure control system or process parameters related to air contaminant emissions. The paramenters for which the department will require measurements will be specified in the permit. Examples include:

- fuel flow (volumetric or weight)
- chemical flow
- pH
- production rate
- pressure drop
- water pressure
- voltage
- frequency (of precipitator discharge, baghouse pulsing, or salient feature of other cyclical control devices)

A facility under permit may be required to periodically measure or test fuels or chemicals burned, sorted or transferred. Examples include:

- solids content
- moisture content
- sulfur content
- ash content
- volume in storage vessel
- temperature of storage vessel
- throughput

Monitoring equipment specification and calibration, testing procedures and data reporting and reduction shall be in accordance with 40 CFR 60 Appendix B, Performance Specifications 1 (opacity), 2 ($SO_2$, $NO_x$) and 3 ($CO_2$, $O_2$), and air quality control permit to operate requirements. ASTM, TAPPI, API or other appropriate national industrial testing methods may be used if approved by the department.

The criteria for determining the type of monitoring instrument include the source category, pollutant control system and ambient air quality. Examples of instrumentation which may be required for particular source categories are listed below. These include the applicable monitoring requirements specified in 40 CFR 60 (NSPS).

° Opacity (transmissivity)

  - Coal or wood-fired boilers of any size if a control system has been installed to comply with opacity or particulate matter emission regulations.

- Oil-fired or chemical-fired boilers, rated at or greater than 150mm BTU/hr or of any size if a control system has been installed to comply with opacity or particulate matter emission rate regulations.

- Incinerators rated at more than 2000 lb/hr; silo burners or air curtain incinerators will be excluded from this requirement.

- Oil-fired turbines or engines if the source has been cited in violations of visible emissions regulations in separate incidences over one year.

- Fluid catalytic cracking unit catalyst regenerator.

- Portland cement plant clinker cooler of kiln or a coal treating facility thermaldrier or pneumatic coal cleaner which has a particulate matter control system installed.

° Sulfur Dioxide

- Coal-, oil- or chemical-fired boilers, turbines or engines of any size if the sulfur content of the fuel will exceed 0.7%.

- Coal-, oil- or chemical-fired boilers of 100mm BTU/hr or greater if a control system will be installed to comply with $SO_2$ emission regulations.

- Process gas-fired heaters of any size if the fuel will contain more than 230 mg/scm $H_2S$.

The applicant may propose alternate monitoring schemes for approval, such as determining the sulfur content of the fuel or measurement of those parameters which control the sulfur dioxide emissions.

° Nitrogen Oxides

- Any facility with a total rated capacity of boilers, turbines and/or engines exceeds 4000mm BTU/hr must monitor $NO/NO_2$ if the ambient level of $NO_2$ in the airshed is greater than 50% of ambient standards.

- Any boiler, turbine or engine rated at 200mm BTU/hr or greater will be required to monitor $NO/NO_2$ emissions if source tests show emission rates are greater than 70% of applicable emission standards, or ambient levels of $NO_2$ in the airshed are greater than 50% of ambient standards.

° Oxygen, Carbon Dioxide, Temperature, Flow Rate

The department may require the owner/operator to monitor these parameters, to assure proper operation of the facility.

° Other Parameters

- The owner/operator of an incinerator must measure the quantity and type of wastes burned and quantity of auxiliary fuel burned in the incinerator and control system.

- The owner/operator of a fuel-burning facility must measure the quantity of fuel burned and may be required to test the sulfur, ash and moisture content of the fuel.

- The owner/operator of a refinery, crude oil or petroleum product storage and/or transfer facility may be required to measure storage temperature, tank level and throughput.

- The owner/operator of a facility which installs a particulate matter or sulfur dioxide control device to comply with regulations may be required to monitor operating parameters such as:

  Baghouse --pressure drop, pulse rate, exhaust temperature;
  Scrubber --water flow, water pressure, pressure drop, ph, exhaust temperature;
  Precipitator --voltage, discharge rate, water pressure, exhaust temperature;
  Mechanical Collectors (multiclones, mist eliminators, etc.) --pressure drop.

Source Testing

Generally, it is department policy that a compliance demonstration by source testing is not required for newly constructed sources, especially those sources which are too small to necessitate obtaining a permit to operate unless specifically mandated by state or federal laws or unless specific reasons exist to suspect noncompliance with either emission limitations or ambient standards. When required, testing is to be performed within 90 days following start up of source. Additional time may be granted to optimize operation of the facility and/or its control system but testing should be done within 180 operating days after startup.

Alternative testing or monitoring methods may be proposed by the owner or operator. The department will reduce costly testing, monitoring, or record keeping procedures which are not necessary to assure compliance with applicable emission limitations. However, EPA must approve alternative testing or monitoring programs recommended by the department. Alternatives such as determining the sulfur content of fuels, testing one of a group of similar sources and process monitoring instead of emission monitoring are types of alternatives which may be evaluated.

The department may require source tests on a routine basis or upon notification if necessary to monitor or confirm compliance with allowable emission rates during a compliance program, special evaluation or change in operating procedures, in lieu of continuous monitoring, or when the source has been observed in violation of, or is suspected of being in violation of applicable regulations. The department, with consent of permittee, may conduct source tests to confirm compliance, determine emission rates, or for educational/instructional purposes.

Due to the extreme difficulty and questionable validity of performing source tests on the exhaust plume of fuel burning flares for particulate and sulfur dioxide emissions, the emission limitations identified in 18 AAC 50.050 (b) and 18 AAC 50.050 (c) do not apply to fuel-burning flares.

Source tests will be performed in accordance with 40 CFR 60 Appendix A, Reference Methods 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, and 20 as amended November 1984.

REV. 11/84

3. Prevention of Significant Deterioration

## Basis of Program

In August 1977, the U.S. Congress passed amendments to the Clean Air Act. A major feature of these amendments were the requirements to prevent deterioration of ambient air quality, particularly in areas such as the majority of Alaska where the air is much cleaner than the Ambient Air Quality Standards. The Prevention of Significant Deterioration (PSD) requirements establish allowable incremental changes in air quality which may not be exceeded by industrialization and urbanization. In a PSD application, the owner/ operator of a major new or modified facility must determine the existing air quality and calculate the changes in air quality caused by other facilities constructed after January 1975 and/or growth in the area occurring after the baseline date triggered by the first complete PSD permit application in the area impacted by the proposed facility. The PSD applicant must also calculate the changes in air quality which will occur from operation of the proposed facility.

Also needed is an analysis of air quality standards and PSD increment consumption whenever a state relaxation of emission requirements for an existing or permitted facility results in an actual increase in emissions. If the relaxation of an emission standard or a limitation on the operation of one or more sources at a facility installed after August 7, 1980, leads to an increase in allowable emissions, a PSD applicability determination will be made. If the analysis affirms PSD regulations apply, the owner or operator of the facility must prepare a complete PSD analysis for the affected portion(s) of the facility.

The PSD requirements are of importance to Alaska because all new major industrial or power generating facilities must obtain a PSD permit before commencing construction. A project cannot be approved until the applicant has demonstrated the PSD increment will not be violated, and all of the procedural requirements have been satisfied.

The Department will assist the applicant as much as possible to minimize the applicant costs and the time required to review an application. Frequent consultation between the applicant and the Department will ensure an acceptable monitoring program is developed to provide sufficient data. The Department will notify the applicant of the information to be included in an application at the earliest possible time. Discussions of the various aspects of the project while the application is being prepared will help avoid undue delays during final review.

## PSD Regulations

The relationship between the regulation revisions and the PSD Program is outlined below.

- Ambient air quality increments and standards which are not to be exceeded by a project or series of projects; 18 AAC 50.020

- Identification of nonattainment areas, Class I areas, Class II areas, Class III areas, and areas protected from visibility degradation; 18 AAC 50.021(a), (b), and (c)

Procedures for reclassifying areas and limitations on reclassifications; 18 AAC 50.600

An owner/operator of specified facilities must apply for and obtain written approval from the Department prior to construction and modification; 18 AAC 50.300

Limitations on the use of stack height and dispersion techniques; 18 AAC 50.530

The owner/operator of a proposed or modified PSD facility to provide data so the Department can determine whether Best Available Control Technology (BACT) is being applied; 18 AAC 50.300(b)(4) and (c)(3)

The Department cannot grant a permit if PSD increments or ambient air quality standards are exceeded; 18 AAC 50.400(c)

The PSD applicant must demonstrate compliance with ambient air quality standards or increments using approved air quality models or their equivalent; 18 AAC 50.300(c)(2)

The Department cannot grant a permit if applicable regulations established under AS 46.03 are not met; 18 AAC 50.400(c)

The owner/operator of a proposed PSD facility must install and operate an ambient air monitoring network if required by the Department; 18 AAC 50.400(c)(1), 510, and 520

The owner/operator must submit a complete application including information necessary to determine compliance with regulations; 18 AAC 50.300

Regulations provide for public participation and describe public hearing procedures; 18 AAC 15.060
18 AAC 50.400

The owner/operator is required to comply with applicable requirements of law regardless of Department action or inaction by statute; AS 46.03.160(g)

PSD Analysis Procedure

The department will analyze the application, and request any additional information which may be required within thirty days after initial receipt of the PSD application.

Witnin thirty days after receipt of a PSD application and all required supporting information from the applicant, the department will make a preliminary determination whether construction should be approved or disapproved. Copies of this determination as well as the PSD application and other pertinent materials will be made available to the public through the appropriate regional office of the department. The public will also be notified they have thirty days to comment on the documents and the facility's air quality effect, and may request a public hearing, within the first fifteen days of the comment period Notification shall be in at least one newspaper of general circulation in the area affected by the facility's operation.

Copies of this public notice will be sent to the applicant, the EPA Regional Administrator, the EPA Alaskan Operations Office, and to the affected local, State and Federal agencies.

If the owner or operator uses a model not listed in OAQPS No. 1.2-080 or modifies an approved model to determine increment consumption or compliance with ambient air quality standards, the model or modification will be subject to public review as part of the public review process on the permit application. Approval of the model or modification must be obtained from the U.S.Environmental Protection Agency, Region X, which will be indicated in the department's final determination document.

If a public hearing is requested, notification of such and procedures during the hearing will be in accordance with procedures for holding a public hearing, 18 AAC 15, on file in the Lieutenant Governor's Office.

The public will have fifteen days after the public hearing to submit written comments to the department; at that time the application shall be deemed complete in accordance with the State regulation 18 AAC 15 and Alaska Statute 46.03.160. Within thirty days of this date, the department will make a final determination whether construction shall be approved or disapproved, and issue the permit or the reasons for denial. The facility will be notified in writing of the final decision and copies of this determination will be sent to all interested parties.

4. Nonattainment Area Review

Approval of the proposed facility will be granted if the requirements in 18 AAC 50.400(c)(1) and (c)(2) and the nonattainment requirements in 18 AAC 50.400(c)(4) are complied with.

All applicable regulations of Chapter 50 that relate to the specific facility locating in a nonattainment area are applicable to the facility. This could include the ambient air quality standards listed in 18 AAC 50.020, the approval needed to construct as required in 18 AAC 50.300 and the emission limits in 18 AAC 50.040, 050, 060, and 300.

Also, federal regulations require an analysis of air quality standards whenever a state relaxation of emission requirements for an existing or permitted facility results in an actual increase in emissions. If the relaxation of an emission standard or a limitation on the operation of one or more sources at a facility installed after August 7, 1980, leads to an increase in allowable emissions, a nonattainment determination will be made. If the regulations apply, the owner or operator of the facility must prepare a complete analysis of the affected portion(s) of the facility.

5. New Source Performance Standards

New Source Performance Standards (NSPS) are emission standards set for specific major stationary source categories to employ current control technology. Specific monitoring, testing and recordkeeping requirements are also included in these regulations.

The state will implement the delegated NSPS through the permit program described in the previous sections. Specific monitoring, testing, record-keeping and reporting requirements will be included in each individual permit based on the federal requirements specified in 40 CFR 60. In carrying out this program, the State intends to insure these requirements are implemented in a rational manner in Alaska, and minimize the number of agencies to which owners/ operators of sources in Alaska are responsible.

NSPS have been promulgated by EPA for many categories of sources. The State of Alaska is responsible for administering NSPS requirements for

° Incinerators with a charging capacity greater than 50 tons per day
° Municipal wastewater treatment plant sludge incinerators serving communities greater than 10,000 persons
° Asphalt plants
° Petroleum refineries
° Coal preparation plants
° Portland cement plants

In addition, control determinations equal to but not more stringent than the control required by NSPS can occur in the PSD analysis on a can-by-case basis. This includes source types not delegated to the state. The applicable monitoring and testing requirements would most likely be included also.

The specific regulations which implement each aspect of the New Source Performance Standards program for these source categories are:

° Regulations limit emissions from stationary sources including certain New Source Performance Standards (NSPS) source categories;
18 AAC 50.040, and 050

° Regulations require the owner/operator of facilities of certain sizes or categories submit information and obtain permits. The permit may include testing/monitoring requirements;
18 AAC 50.300, 400, 500, 510, and 520

° Applicable source testing, monitoring and reporting requirements will be specified in the permit; 18 AAC 50.400 and 500

Continuous monitoring, testing and reporting requirements are listed in Section IV.G.1. The specific requirements for each source category are in 40 CFR 60, which will be used to determine the monitoring and reporting requirements.

Existing NSPS sources listed above fall under state NSPS regulation when modified or changed so to be subject to a new review under 40 CFR 60.

6. Visibility Review

The December 2, 1980, Federal Register presented regulations for protection of visibility in Class 1 areas and in specified areas viewed from a Class I area which have scenic value. Two areas identified by the federal land manager of Denali (Mount McKinley) National Park are Mount Deborah and the Alaska Range East, as viewed from approximately the Savage River River Campground area, and Mount McKinley, Alaska Range and the Interior Lowlands, as viewed from the vicinity of Wonder Lake.

The strategy for maintaining these areas and any Class I areas in the state is to require stringent review requirements for new or modified facilities that may affect one of the areas by

° Continuing discussion between the state and applicable federal land managers including early notification of federal land managers after first contact of applicants, transmittal of the complete application for a proposed facility within 30 days of receipt, and 60 days notification of public hearings on the proposed facility. The state will consider the federal land manager's comments and address them in the notice of public input;

° The permit applicant must submit an analysis of potential visibility impairment and background monitoring through the application procedures described in Section IV.G. Monitoring of existing natural conditions and monitoring of the change caused by proposed facility may required. Natural conditions include naturally occurring phenomena that reduce visibility in terms of visual range, contrast or coloration; and

° 18 AAC 50.300(c)(4) states visibility must be addressed by the applicant. 18 AAC 50.300(c)(3)(c) states "Approval (of the proposed project) will be granted only if the applicant shows that allowable emissions from the facility and from associated growth will not adversely affect air quality related values, including noise, odor, visibility, vegetation, and soils of any area within the state."

These values would be considered differently depending on the proposed location of the facility. Locating near a populated area may require a more stringent review of visibility values, for example. Impacting an area listed in 18 AAC 50.021(c)(3) would require an analysis of the adverse impact on visibility as defined in 40 CFR 51.301(a) while impacting an area listed in 18 AAC 50.021(c)(1) or (c)(2) would require an analysis of the adverse impact on visibility as defined in 40 CFR 51.307(c).

The federal strategies of emission reductions, compliance schedules, and source retirement to eliminate existing visibility degradation do not apply since no facilities have been identified that affect the areas listed in 18 AAC 50.021(c). Construction activity mitigation and smoke management will be handled on a case-by-case basis to minimize visibility degradation.

The long-term strategy for maintaining the existing visibility includes a rigorous analysis of any new or modified major facilities that may affect these area; a mutual agreement between the state and federal agencies involved in forest management in proper smoke control techniques, and an annual review as provided for in Section IV.A.1.

7. Sources Under EPA Review

New sources subject to NESHAPS requirements or federal NSPS not delegated to the state and not otherwise subject to permit requirements in 18 AAC 50.300 will be evaluated by ADEC for increment consumption and compliance with air quality standards. The evaluation will take into consideration the type and rate of emissions, emission control system efficiency, and impact on ambient air quality standards.

These sources will be evaluated by the EPA upon notice by ADEC the source may be subject to these regulations.

If the EPA-written determination whether the source is under their control has not been received by the state and a state permit needs to be issued, the cover letter of the permit will contain the following statement: "Your facility may also be subject to federal control. Please contact Mike Johnston, EPA Region X, 1200 W. Sixth Avenue, Seattle, WA 99801, for information."

EPA has also kept control of the permit process on Indian reservations, as that is not delegatable to the states.

## H. PERMIT ISSUANCE REQUIREMENTS

The purpose for issuing an air quality control permit is to assure a facility maintains compliance with applicable air quality regulations. Every effort will be made to eliminate permit requirements not necessary to achieve this purpose. All permits will include a brief description of the operation of the facility and several standard conditions. Occasionally a permit may require specific testing procedures, notification prior to intermittent operations, maintenance specifications or other unique conditions . An example of a standard permit is shown in Figure IV.H-1.

For projects subject to a BACT determination, the permit conditions will require reanalysis of control technology for each affected source at the facility if construction has not begun within eighteen months following issuance of the permit. In this instance, the concept "begun construction" includes entering into contractual obligations of off-site fabrication or onsite construction which cannot be cancelled or modified without substantial loss to the owner or operator of the facility.

Generally, a source subject to BACT or LAER determination will contain source-specific emission limitations in their permit.

As a condition of each permit, the department will specify requirements needed for periodic reporting of operating hours/days, fuel consumption, production rates, operating parameters, maintenance work, monitoring or test data, and equipment failures or operating conditions which affect air contaminant emissions. Additional test data or written reports of equipment failures may be submitted at any time at the discretion of permittee.

The data required to be reported will be specified in an attachment to the permit. A report is required even if a facility did not operate during the reporting period. An example of data to be reported for a relatively complex facility is shown in Figure IV.H-2. Specific reporting requirements will be established for each permitted facility. The listing below indicates applicable reporting requirements to be selected, and includes those specified in 40 CFR 60 (New Source Performance Standards).

° Operations; Hours or days per month or quarter each source or the facility was in operation including periods during which a new source was tested prior to actual productive startup.

° Production rate; Daily average per month or quarter; maximum/minimum day in each month or quarter; annual total.

° Fuel consumption; Type of fuel or waste burned; daily average and total quantity per month, quarter or year.

° Source tests; A summary report of required source tests including date, testing method and sampling train, fuel burning or operating rate, % isokinetic sampling concentration or emission rate and stack exhaust gas flow rate, temperature and water vapor content.

° Continuous stack monitoring;

- opacity (transmissivity) -- daily average in %;

- sulfur dioxide -- weekly average, maximum and minimum day in applicable units such as ppm, lb/mm Btu fuel burned, lb/day, lb/ton of product;

- particulate matter -- weekly average, maximum and minimum day in units such as lb/day, lb/ton product, lb/1000 lb coke burn-off;

- NO/NO2 -- weekly average in units such as ppm, lb/mm Btu fuel burned;

- O2/CO2 -- monthly average in terms of % excess air or actual concentration;

- temperature -- monthly average.

° Ambient monitoring;

- meteorological parameters, sulfur dioxide, nitric oxide, nitrogen dioxide and other gases - hourly averages for each monitor submitted on magnetic tape or disk in SAROAD format;

- particulate matter -- twenty-four hour sample of total concentration sampled every 2, 3 or 6 days; permittee may be required to analyze one or more samples per month for chemical or physical characteristics such as lead, urea, phosphate, sulfate, fluoride, or size distribution.

° Control system parameters; weekly averages of those parameters which describe the operation of the particular control system.

° Fuel quality monitoring; monthly average sulfur or H2S content of fuel based on continuous monitoring, weekly or monthly testing; sulfur content by shipment if delivered less frequently than once a month; monthly average moisture and ash content of coal, woodwaste, solid waste or sludge based on weekly testing.

° Petroleum storage; type(s), typical Reid vapor pressure(s), date(s) stored, throughput per month or quarter, average storage temperature based on daily or weekly measurement.

° Equipment failures or operating conditions which may affect air contaminant emissions;

- an initial report shall be submitted verbally or in writing to the appropriate regional office of the department within 5 working days, 24 hours or such other time period specified in the permit.

- a complete report describing the incident must be submitted with the routine periodic report and include:
  - i) date
  - ii) duration of incident
  - iii) nature of the occurrence
  - iv) equipment failures
  - v) steps taken to minimize emissions
  - vi) measures taken to avoid recurrence
  - vii) available monitoring data, type and quantity of emissions.

FIGURE IV.H-1
EXAMPLE STANDARD PERMIT

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONTROL
PERMIT TO OPERATE

Permit No. 8310-AA000 Date of Issue: February 1, 1983

The Department of Environmental Conservation, under authority of AS 46.03 and 18 AAC 50.400, issues an Air Quality Control Permit to Operate to

ABC COMPANY, INCORPORATED
1111 FIRST AVENUE
ANYWHERE, ALASKA 99000

For the operation of three oil-fired turbines and one incinerator as described in the ABC Company, Incorporated permit application and supplementary information transmitted by letters dated November 25, 1982, and December 15, 1982.

The facility is located at the Tongass Municipal Utility Plant, two miles northwest of Anywhere, Alaska

The following conditions shall apply:

1. Permittee shall comply with the Ambient Air Quality Standards and Increments set by 18 AAC 50.020, and the applicable emission standards set by emission standards set by 18 AAC 50.040 and 050.

2. Permittee shall dispose of residue from the incinerator only at a solid waste disposal site approved by the Department.

3. Air Contaminant Emission Reports as described in Exhibit A shall be submitted to Southcentral Regional Office of the Department by within 30 days after the end of each calendar quarter.

4. Permittee shall operate and maintain all fuel burning equipment to provide optimum fuel burning efficiency during all operating periods.

5. Representatives of the department, with permittee's approval, are allowed access to permittee's facilities to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit and State environmental laws and regulations.

6. A copy of this permit shall be clearly displayed and the State Air Quality Regulations 18 AAC 50 kept on file at the permitted facility location.

This permit expires 30 January 1988 and may be revoked or suspended in accordance with 18 AAC 50.310.

REGIONAL ENVIRONMENTAL SUPERVISOR
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE IV.H-2
EXAMPLE PERMIT ATTACHMENT

EXHIBIT A
AIR QUALITY CONTROL PERMIT TO OPERATE 8310-AA000
AIR CONTAMINANT EMISSION REPORT

An Air Contaminant Emission Report shall be submitted to the department quarterly by April 30, July 30, October 30 and January 30 each year. The report shall include, but not be limited to, the following information:

NAME OF FIRM
LOCATION OF FACILITIES
PERIOD OF REPORT

| | Quarterly total |
|---|---|
| 1. DAYS OPERATED | Number of plant days; hours or days for each unit if different from total plant |
| Process boiler<br>Oil-fired boiler<br>Incinerator<br>Standby diesel generator | |
| 2. PRODUCTION | Tons product |
| Maximum day<br>Minimum day<br>Period average | |
| 3. FUEL CONSUMPTION | Indicate type of fuel consumed |
| Process boiler | Pounds chemical and average % solids |
| Oil-fired boiler | Barrels; indicate average sulfur content based on two or more analyses per quarter* |
| Incinerator | Pounds, waste, type |
| Auxiliary fuel | Gallons $X10^3$ |
| Standby diesel generator | Gallons $X10^3$ |

*Report any change in supplier or type of fuel oil.

4. EMISSIONS DATA, CHEMICAL BOILER

a. Sulfur oxides (continuous monitoring)

| | |
|---|---|
| Maximum day<br>Minimum day<br>Period average | 24-hour average lb $SO_2$/ton product |

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Exhibit A, Air Quality Control Permit to Operate 8310-AA000, (Continued)

| | Quarterly Total |
|---|---|
| b. Particulate matter | Summary results of 2 particulate matter source tests per month including: date, testing method and sampling train, firing rate of boiler, % isokinetic, concentration or emission rate, stack exhaust gas flow rate, stack temperature, and stack water vapor content |
| 5. EMISSIONS DATA, OIL BOILER | |
| a. Sulfur oxides (continuous monitoring) | Indicate date, average sulfur dioxide concentration and duration of any period during which the concentration exceeds 500 ppm for sixty minutes or more if monitor installed pursuant to 40 CFR 60.45(a) |
| b. Particulate matter (continuous monitoring) | Record weekly average opacity or transmissivity to nearest 5% if greater than 25%, if less than 25% indicate "25%" |

6. Additional source test data may be submitted at the discretion of permittee, if requested by the department, or to substantiate certification of compliance with applicable regulations.

| | |
|---|---|
| 7. AMBIENT AIR DATA | Hourly averages for each monitor.* Data may be submitted on magnetic tape or disk in SAROAD format. |
| a. Meteorological parameters | Continuous wind speed, wind direction and air temperature at 2 stations |
| b. Sulfur dioxide | Continuous concentration at 1 station |
| c. Particulate matter | Twenty-four hour sample of total concentration every six days at 1 station |

*Monitoring stations and parameters as described in the ABC Chemical Company letter dated January 29, 1973.

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Exhibit A, Air Quality Control Permit to Operate 8310-AA000, Continued

8. Attach a detailed description of equipment failures or operating conditions which may have adversely affected air contaminant emissions. A preliminary report of the incident shall be submitted within five working days to the Regional Office of the department (111-1111) in Anywhere, Alaska. A separate report is required for each incident.

   Include such information as: date of incident, duration, nature of occurrence, equipment failures, steps taken to minimize emissions, measures taken to avoid recurrence, available emissions and ambient air data, and a general description of the weather.

9. Attach a brief discussion of any change in operations, stack monitoring equipment, testing procedures, air quality or meteorological equipment or locations which may affect reported results, or failure which may have have affected the results or resulted in incomplete or lack of data for any given day.

10. Signature of authorized agent preceded by the statement: "I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete and accurate."

11. Date of report.

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# SECTION V

# AMBIENT AIR MONITORING

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SECTION V

## AMBIENT AIR MONITORING

### A. PURPOSE

The state air quality surveillance network is to provide:

1. an accurate and current definition of air quality throughout the state, as related to the time of year, meteorological and topographical conditions;

2. a means for evaluating the effectiveness of control strategies for achievement of ambient air standards, and maintenance of existing air quality;

3. data for activating emergency control measures, and

4. air quality trend data which may be related to industrial development, urbanization or other activities.

The statewide air monitoring network is operated cooperatively between the state and local air pollution control programs in Anchorage and Fairbanks. The department's central office in Juneau serves as a focal point for the collection of all statewide monitoring data. The following sections present a general description of the statewide air monitoring network, a summary of data collected thus far from all monitoring sites, and the quality assurance procedures to be followed for assuring accuracy of data.

Ambient air quality data is also collected, analyzed and submitted to the department by applicants for Prevention of Significant Deterioration permits. This data will aid substantially in quantifying ambient air quality conditions in nonpopulated areas, and will be added to the data collected by the agencies and evaluated in the annual summary. While the state will not perform site-specific ambient monitoring for PSD permit applicants, data from the state air monitoring network will be made available to the PSD applicants to the extent that it will aid in their air quality analyses. Monitoring requirements for permit applicants under the Prevention of Significant Deterioration requirements of the Clean Air Act are contained in Section V of Volume III of this plan.

The Alaska ambient air monitoring network, described in this section is designed to meet the provisions of the EPA regulation for monitoring air quality, 40 CFR Part 58.

## B. COMPLETED AIR MONITORING PROJECTS

Since 1973 the air monitoring network in the state has measured ambient concentrations of carbon monoxide, sulfur dioxide, nitrogen oxides, ozone, lead and total suspended particulates. Additional monitoring performed by the private sector in support of permits for the Prevention of Significant Deterioration program has delineated air quality conditions in other areas of the state. All monitoring collected by the state, local agencies and that submitted by the private sector is a public record and, as such, is available to the general public upon request. Itemized below is a brief description of the monitoring results for the specific projects conducted.

### 1. Carbon Monoxide

The majority of air monitoring for carbon monoxide has been performed in the cities of Anchorage and Fairbanks. Portions of each city have been declared nonattainment zones for this pollutant because exposures above the health standard have been recorded since the early 1970s. Section III of this plan presents an in-depth assessment of the observed exposures, sources of the pollutant and probable methods of correcting the present situation.

Transportation sources have historically been the primary source of this pollutant in Alaska. However, significant increases in residential wood burning for home heating purposes may result in the expansion of existing air quality problems or the creation of new problem areas.

Monitoring of carbon monoxide at Prudhoe Bay demonstrated very low concentrations.

### 2. Nitrogen Oxides

At the present time, no locations in Alaska have been identified as having high concentrations of nitrogen dioxide. While nitrogen dioxide can affect a person's health, other oxides of nitrogen, in addition to nitrogen dioxide, are precursors of ozone and acid rain. Presently, it is anticipated that the latter two situations are not a threat to the environment of Alaska. However, a monitoring project is currently underway in the Kenai Penninsula to measure oxides of nitrogen relative to the formation of acid rain.

Other monitoring projects for nitrogen oxides have been performed in Valdez and Prudhoe Bay. Levels in Valdez have been found to be relatively low. Concentrations measured at Prudhoe Bay prior to most of the oil development indicated very low exposures of nitrogen dioxide. However, computer model projections of ambient exposures when all oil development facilities are installed indicate a significant concentration of nitrogen dioxide. Future additional facilities at Prudhoe Bay may warrant actual monitoring of concentration levels.

3. Sulfur Dioxide

For several years a wet chemical method was utilized to measure sulfur dioxide every sixth day near the two pulp mills in southeast Alaska. All collected data indicated exposures well below the sulfur dioxide standards. These monitors have been replaced by an instrumental analyzer which continuously measures the ambient concentration. The instrument located near the pulp mill at Sitka again demonstrated very low values. Data is currently being gathered near the pulp mill at Ketchikan.

For several years monitoring of sulfur dioxide was performed at a number of locations around Valdez. Early computer projections indicated that operation of pipeline terminal facilities and emissions of oil tankers would result in violations of the standard. These projections were incorrect through actual monitoring. The monitoring demonstrated occasional elevated exposures of sulfur dioxide. However, the highest recorded concentration was 60% of the ambient standard.

Monitoring for sulfur dioxide is currently being performed in the Kenai Penninsula for an acid rain assessment project. In the city of Anchorage an instrument has been installed to measure the ambient impact of a coal burning power plant. Although data is now becoming available for both of these monitoring locations, it is anticipated that these monitoring projects will be active for two to three years.

4. Ozone

Monitoring of ozone has been conducted in Valdez and Prudhoe Bay. Essentially, these monitors have been measuring natural background levels. Measured values were very low throughout the year except during the spring. During this season values were elevated with a maximum of approximately 60% of the standard. Since these elevated values were associated with specific climatic conditions, it has been therorized that ozone-rich lenses of the stratosphere have intruded into the lower atmosphere under these specific weather regimes.

In other areas of the country, elevated values of ozone are usually attributed to atmospheric reactions of other air pollutants in the presence of warm temperature and intense sunlight. Presently, it is not anticipated that high ozone levels will occur in Alaska since ambient temperatures are lower and solar radiation is less intense. For purposes of verification, the Municipality of Anchorage is now operating an ozone monitor in the Anchorage area.

5. Total Suspended Particulates (TSP)

Although some areas of the state have experienced TSP concentrations above the national standards, most of the particulates are too large in size to be inhaled. These large particles, which are mostly made up of wind blown dust particles, do not constitute a health hazard, and TSP monitoring data will not necessarily indicate a health related problem unless a small-particulate source is nearby. The U.S. Environmental Protection Agency has recognized that these high TSP concentrations are not a health risk and therefore declared the state to be in attainment for total suspended particulates.

Recently, because of the resurgence of wood use for home heating purposes, some specific locales within the state have exhibited high TSP concentrations. Particulates emitted from wood burning are small in size and therefore do present a health risk when concentrations approach or exceed the standard. During November of 1982, several days in the Mendenhall Valley of Juneau were found to exhibit TSP exposures significantly above the state ambient standard. As a result of these high concentrations, several air quality alerts and three air quality emergencies were issued by the Department when high pollution concentrations were anticipated. The alert system, through the cooperation of the wood users, has effectively kept the TSP levels below state and federal standards. Through chemical analysis of the TSP samples and utilization of a computer technique called receptor modeling, an apportionment of the actual paticulate exposure generated by each source in the Mendenhall Valley was determined. This report entitled "Preliminary Source Apportionment of Winter Particulate Moss in Juneau, Alaska" is available upon request.

Ambient monitoring for total suspended particulates has been more widely performed than all other pollutants. Data is available for many of the smaller communities of the state, in addition to the cities of Anchorage, Fairbanks, and Juneau.

Through requirements of the Clean Air Act, the U.S. EPA has been mandated to establish a more appropriate method of measuring suspended particulate matter. This new method, which will more directly correlate to the human body's ability to inhale the particles, has not been developed as yet.

6. Lead

Ambient monitoring for lead has been conducted at two locations in Anchorage and three locations in Fairbanks. Upon the completion of a two-year data gathering project, exposure levels have been determined to be below state and federal standards (see Table III.H-1). The highest concentrations have been observed during the winter season. Monitoring will continue in both cities although at a reduced level to track any future trends in the human exposure to this pollutant.

## C. AIR MONITORING NETWORK

Several changes have been made in the state monitoring system using the original Air Quality Plan in 1972, because the purposes for which some of the sampling sites were originally selected have been satisfied. The discussion below describes the air monitoring network which should produce sufficient data to monitor Alaska's air quality conditions. This monitoring system will be reviewed annually by the Department to determine any modifications in the network. Any proposed changes to the State and Local Air Monitoring Station network will be approved by the Ambient Monitoring and Analysis Branch of the Region X office of the U.S. EPA prior to implementation. New monitoring equipment will be considered if other pollutants are identified or if potential problems with existing pollutants arise.

All continuous monitors will operate throughout the year. The particulate monitors will operate for 24 hours every sixth day, according to the schedule contained in the State Quality Assurance Handbook for Ambient Monitoring.

U.S. EPA criteria have been adopted by the State to describe how large of an area is to be represented by each monitoring site. These areas have been divided into "scales" of representativeness, and those of most interest in Alaska are as follows:

- Microscale - defines the concentrations in air volumes with dimensions ranging from meters up to about 100 meters.

- Middle scale - defines the concentrations typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

- Neighborhood scale - defines concentrations within an extended area of the city that has relatively uniform land use with overall dimensions in the 0.5 to 4.0 kilometer range.

- Urban scale - defines the overall, citywide conditions, with overall dimensions on the order of 4 to 50 kilometers. This scale would usually require more than one site for definition.

The State Quality Assurance Handbook for Ambient Monitoring describes the air monitoring network, its operation and how data is to be retrieved with a high degree of precision and accuracy.

### 1. Network Description

A full description of the monitoring network is available for public inspection at the Department's central office in Juneau and in each of the regional offices located in Juneau, Anchorage and Fairbanks. The network description will consist of the following for each station in the air quality surveillance network:

a) The SAROAD site identification form;
b) The identification of the monitoring method or analyzer;
c) The identification of any necessary method of sample analysis;
d) The sampling schedule;
e) The monitoring objective;
f) The spatial scale of representativeness.

2. Station Designations

Each station in the air quality surveillance network described in this section is identified as a "State and Local Air Monitoring Station." The purpose for the identification is to coincide with the U.S. EPA's intention to systematically evaluate the overall trends in pollution control throughout the United States. EPA and the State will select a number of sampling stations from the State and Local Air Monitoring Station Network for reporting data to satisfy EPA's requirement for nationwide trend data. This subset of stations will be called "National Air Monitoring Stations."

A third type of station is defined by EPA as a "Special Purpose Monitor." The Special Purpose Monitor is one that is not included in the State and Local Air Monitor Station network. Data from this type of station will not normally be submitted to EPA, and a Special Purpose Monitor will not necessarily need to meet the siting requirements or the monitoring requirements imposed upon the State and Local Air Monitoring Station network. The data collected form the special studies will be evaluated as part of the department's annual air quality report.

3. Air Quality Monitoring Procedures

Insofar as is possible, all ambient air monitoring stations in the State of Alaska's state and local air monitoring station network will be operated in accordance with the criteria established by Subpart B of 40 CFR Part 58, and will be sited in accordance with the siting parameters contained in Appendix E to 40 CFR Part 58.

Each continuous analyzer will be operated on a continuous basis and data reported as hourly averages. Each manually operated sampler will be operated for a full 24-hour period at six day intervals. All sampling methods used in the state network will be reference methods or equivalent methods as defined by EPA in 40 CFR Part 58.

The quality assurance procedures of Appendix A to 40 CFR Part 58 will be followed to the extent possible when operating the network and processing air quality data. ADEC will provide for auditing services for operators of all instruments designated as State and Local Air Monitoring stations.

All data will be submitted to ADEC for subsequent analysis and storage. The data handling and submission requirements are outlined in the State Quality Assurance Handbook for Ambient Monitoring.

4. Ambient Sampling for Specific Pollutants

This section describes general characteristics of the state air monitoring network. As changes are made to the network, they will be identified in the State Quality Assurance Handbook for Ambient Monitoring.

Carbon Monoxide

Monitors for carbon monoxide in Anchorage and Fairbanks will be placed so that the appropriate following measurement scales are represented in the State and Local Air Monitoring Station network:

a. One monitor in a microscale location downtown, to represent a maximum concentration. (not determined yet)

b. One monitor in a neighborhood scale location, to represent a maximum concentration in a neighborhood.

Total Suspended Particualtes (TSP)

The particulate monitoring data gathering will concentrate on measurement of particulates near industrial sources to make certain that potential ambient air problems do not develop. Particulate sampling in larger populated areas will be done to monitor area source emissions and the progress of dust control programs.

In Anchorage, the Anchorage Air Pollution Control Agency will operate particulate monitors in the National Air Monitoring Station network as follows:

a. One monitor located in a neighborhood scale site. (3000 E. 16th)

b. One middle scale site in the downtown area. (527 E. 4th)

c. One monitor located to represent a maximum concentration in a neighborhood scale area. (3500 Tudor Road)

Other samplers operated by the Anchorage Air Pollution Control Agency in the State and Local Air Monitoring Sation network are illustrated in the State Quality Assurance Handbook for Ambient Monitoring.

In Fairbanks, the Fairbanks North Star Borough will operate particulate monitors in the State and Local Monitoring Station network as illustrated in the State Quality Assurance Handbook for Ambient Monitoring. No National Air Monitoring Stations will be operated in Fairbanks.

Lead

Monitoring for ambient lead exposure will emphasize measurement near transportation right-of-ways. Previous studies indicated that vehicle emission of lead is the primary source of this pollutant in Alaska. Although current exposures are below the health standards and observed concentrations are anticipated to decrease, monitoring will continue in the cities of Anchorage and Fairbanks. For this purpose, one monitor will be maintained to measure middle scale exposures in Anchorage and Fairbanks. These monitors are designated as State and Local Air Monitoring Stations.

Nitrogen Oxides, Sulfur Dioxide and Ozone

Monitoring for these pollutants will be performed at specific locations when and if a potential problem for a pollutant is suspected. Current monitoring is outlined in part B of this section.

## D. EPISODE MONITORING

Development of episode monitoring plans is the responsibility of local agencies. The episode monitoring plan developed by the Anchorage air program is in Section III.B.10 of this volume. The episode monitoring plan developed by the Environmental Services Department of the Fairbanks North Star Borough is Section III.C.10 of this volume.

## E. ANNUAL REVIEW

The Alaska Department of Environmental Conservation will publish an annual review of the air monitoring system each June 30. The review will include the following:

1. A summary and evaluation of all data collected for the preceeding calendar year. Data will be used from State and Local Air Monitors and Special Purpose Monitor.

2. A determination of adequacy of the network. The network and the data collected will be examined to determine if there is a monitor in every location for which there is a need for data, or if all the stations in the network are necessary.

3. A schedule to add stations to the network, eliminate stations from the network or relocate sites will be established if necessary.

4. A summary of all ambient air data submitted as part of any PSD permit application.

10. Air Pollution Episode Plan

Air quality episodes can occur in the Anchorage area when the meteorological conditions are conducive to the buildup of carbon monoxide to levels where health of the general population becomes a significant factor. Under these conditions, this plan is designed to promote a systematic method to inform the public of the hazard, and to provide a rapid short term reduction of the emission levels and allow the pollutant to disperse to safe levels.

Primary responsibility for the control of air pollution episodes rests with the Anchorage Air Pollution Control Agency (AAPCA) Director, (Health Department Director) who will work in cooperation with federal and state agencies to improve a problem situation. To accomplish this objective, this plan of action details below what will be implemented immediately to provide an effective means for rapid reduction in emissions. In addition, this plan is designed to provide information on an orderly basis to the public, as required, so that individual appropriate personal actions may be taken to provide relief from the stressful situation.

General Instructions

As a matter of routine, AAPCA personnel will make periodic visits to each CO continuous monitor to compile data and service equipment.

During periods of high vulnerability, visits will be conducted at least once daily to analyze current air quality and more frequently in periods where level exceed 15 PPM over an eight hour average to assess the trend in pollutant buildup. In addition, current meteorological data will be analyzed. These analyses will be used to develop a synoptic situational picture of pollution potential for a suspended episode by the agency manager, or his appointed representative. Should conditions warrant the action, an air episode will be declared when in the opinion of the Director, or the Manager, that the sustained concentration of carbon monoxide has reached or is predicted to reach certain levels as described by the following paragraphs. These actions are:

9 ppm - 15 ppm (10-17 milligram per cubic meter)
8 hour average - episode potential state

° Moitor all CO analyzers at least once per day. CO data will be analyzed for trends and indications that the potential is building into episode threat.

° periodically check national weather service upper air meteorological data for changes which would cause higher carbon monoxide buildup.

° Notify Agency Director of air quality situation.

° Consider recommending a call for an air episode if forecast meteorological conditions warrant.

° Pass CO information to public media via Municipal Public Information Office.

15 ppm - 30 ppm (17-34 milligram per cubic meter)
8 hour average - air alert

- Assess new CO information as required.

- If meteorological conditions warrant - recommend to Director that an air episode be initiated.

- Manager acts as episode coordinator - defines affected area.

- Director alerts the Mayor through chief Administrative Officer - Operations. Upon evaluation of situation and approval of the Mayor, an alert is called.

- All concerned agencies (ADEC, EPA, etc.) alerted by manager via telephone.

- Spot announcements are made stating that persons with cardiovascular conditions should avoid areas identified as areas with high concentrations of carbon monoxide.

- Agency personnel called in as required. Other environmental engineering personnel needed to provide assistance will be called in as required.

- Open burning ban (if applicable) is announced by Director.

- All fleet vehicle operations contacted and asked for cooperation in reducing traffic activity in high carbon monoxide areas.

- Director to meet with other agencies for areawide coordination (ie: Highway Department; Municipal and State Police).

30 - 40 ppm (34-46 micrograms per cubic meter)
8 hour average - air warning

- The Director requests the Mayor to cut tapes appropriate for radio and televison to ask for help and cooperation in avoiding affected area.

- Contact high air pollution stationary CO sources and request voluntary shutdown.

- Request the Municipal Police Department become involved in making requests that citizens not leave unattended idling vehicles within the high carbon monoxide areas.

- AAPCA personnel will take portable carbon monoxide analyzers to schools within high carbon monoxide areas to determine carbon monoxide levels inside the school.

The information obtained will be reviewed with school officials in connection with two problems:

Exposure of school children to carbon monoxide, and

Exposure of athletes during sports that involve strenuous activity.

Mayor closes schools or postpones sport activities if conditions warrant such action.

- Release of public information notice to the press via the Municipal Public Relations Office.

- Director confers with Mayor and other pertinent officials on strategies to be implemented <u>only</u> in the high carbon monoxide areas specifically defined by the Air Pollution Agency. These include:

  Stagger employee quitting times for federal, state and local governmental employees, and

  If levels greater that 35 PPM are predicted for the next day, excuse governmental employees not performing essential services from working that day.

40 ppm (46 milligrams per cubic meter) and above - air emergency

- With the concurrence and approval of the Mayor, the Agency begins additional action by:

  Issuing press releases through the Municipal Press Officer and contacting all pertinent agencies on dangers of air episode situation;

  Evaluating episode and establishing anticipated projections of air quality and meteorological conditions; and

  Taking legal action as required to reduce carbon monoxide concentrations by restricting the emissions from major stationary source contributors.

<u>Special Criteria - 50 ppm and above</u>

Whenever this level is reached, and conditions are expected to deteriorate even further, a Crisis Management Task Force will be formed. The Task Force will be comprised for the following municipal officals:

Mayor
Municipal Manager
Chief Administrative Officer, Operations
Municipal Attorney
Director, Health and Environmental Protection
Health Department Medical Officer

Duties of Task Force: The duties of the Task Force will be to take actions necessary to stabilize and reverse the deteriorated air quality situation.

If CO levels decrease to below 25 ppm for an 8 hour average, and are expected to continue below 25 ppm for the next 24 hours, then:

Any legally implemented restrictive limits which required an injunction will be lifted.

If CO levels decrease to below 15 ppm for an 8 hour average, and are expected to continue below 15 ppm for the next 24 hours, then:

- ° Local strategies will also be discontinued
- ° The air episode will be declared over.

ANCHORAGE AIR POLLUTION
EPISODE PLAN

(Carbon Monoxide)

This plan was prepared by:

Robert A. (Bert) Hall, Director
Department of Health and
Environmental Protection

Reviewed by:

Ronald A. Garzini, Chief
Administration Officer,
Operations

Approved by:

George M. Sullivan
Mayor

ANCHORAGE AIR POLLUTION CONTROL AGENCY
January 1980

## C. FAIRBANKS TRANSPORTATION CONTROL PROGRAM

Detailed information on all aspects of the air quality plan are contained in Volume II, Fairbanks North Star Borough Air Quality Attainment Plan, 1982. This Volume is incorporated into this SIP by reference. It is available for inspection at the Fairbanks North Star Borough offices and at the Juneau ADEC offices.

### 1. Planning Process

Interagency Coordination

The Fairbanks North Star Borough has areawide planning responsibilities for the entire borough and has, therefore been designated as the lead agency by the governor in accordance with the Clean Air Act. As lead agency the Borough has the responsibility for attaining the carbon monoxide standards by 1987 in Fairbanks and North Pole.

Additionally, the Fairbanks Metropolitan Area Transportation Study (FMATS) Policy Committee was established and supervises preparation of the air quality plan for the Fairbanks area. This committee is made up of the following individuals:

° Fairbanks North Star Borough Mayor

° City of Fairbanks Mayor

° Commissioner, Alaska Department of Transportation and Public Facilities

° Commissioner, Alaska Department of Environmental Conservation

° Presiding Officer, Fairbanks North Star Borough Assembly

° City Manager, City of Fairbanks

Citizen Participation Program

The Clean Air Act Amendments of 1977 require that there be adequate public participation during all stages of plan development. Accordingly, the Fairbanks North Star Borough has sponsored a series of public meetings and hearings in order to keep the public informed about the status of this planning process and to receive appropriate public comment. Copies of all public comment received at these meetings along with copies of newspaper advertisements and articles concerning the attainment planning process, are available from the Borough. The most recent important hearings and meetings are summarized below.

Wednesday, June 2, 1982; 2:00 PM

This meeting was held to present the FMATS Policy Committee with the Fairbanks Air Quality Attainment plan. Four members of that group attended.

Wednesday, June 9, 1982; 8:00 PM

This public hearing was held by Borough staff. Approximately thirty people attended the hearing. A brief presentation was made by the staff on the attainment plan and the staff's technical recommendation. The meeting was then opened up for questions and comments from the public.

A summary of the public comments is presented below.

° No matter what strategies are eventually chosen, the implementation of those measures should be accompanied by a substantial public education program which stresses the benefits, in addition to carbon monoxide reduction, of the various strategies.

° The preheater strategy is viewed as very wasteful of energy. Additionally, it was felt that a better strategy would be to require the installation of electrical receptacles and the provision of electricity (possibly subsidized by local government) but made the plugging-in a voluntary program which would be promoted by a substantial public education program.

° It is felt that voluntary programs or mandatory programs which utilize incentives would be more palatable to the public.

° A centralized inspection and maintenance (I/M) program is greatly preferred over a program where the individual garages are licensed to perform inspections. There is concern that the I/M program might be coupled to a safety inspection program.

° There are many unknowns involved in the gasohol strategy which need to be investigated prior to adopting that measure.

° A representative from the Environmental Protection Agency stated that even if the "do nothing" strategy is chosen the Borough still needs to proceed with the attainment planning process and submit a plan to the State of Alaska to be included in the State Implementation Plan submittal to EPA.

Tuesday, June 29, 1982; 9:00 AM

This was an FMATS Policy Committee meeting. The committee adopted a resolution selecting an I/M program as the primary attainment strategy contingent on the program being shown to be effective.

Speakers Bureau

A speakers bureau was also arranged to provide talks on the air quality situation and the planning process. Over fifty talks involving air quality issues are given per year to various school classes around the Fairbanks area. These classes range from elementary school on up through the college level. In addition to these talks other presentations on the air quality planning process were given to various civic groups and clubs.

Fairbanks North Star Borough Organization and Authority

The Fairbanks North Star Borough has operated a local air pollution control program since 1972 through its Environmental Services Department. The program is entirely funded by the $2 per capita state revenue sharing funds for having an air or water pollution control program (70%), and a continuing federal program grant from the U.S. EPA.

Much of the early efforts were concerned with establishing an ambient air monitoring network and enforcing its regulations concerning open burning, visible emissions and dust control. The Environmental Services Department's air quality efforts have become increasingly centered on air quality planning and finding ways to reduce carbon monoxide ambient concentrations. The Borough has relied on the State to control large stationary emission sources within the Borough.

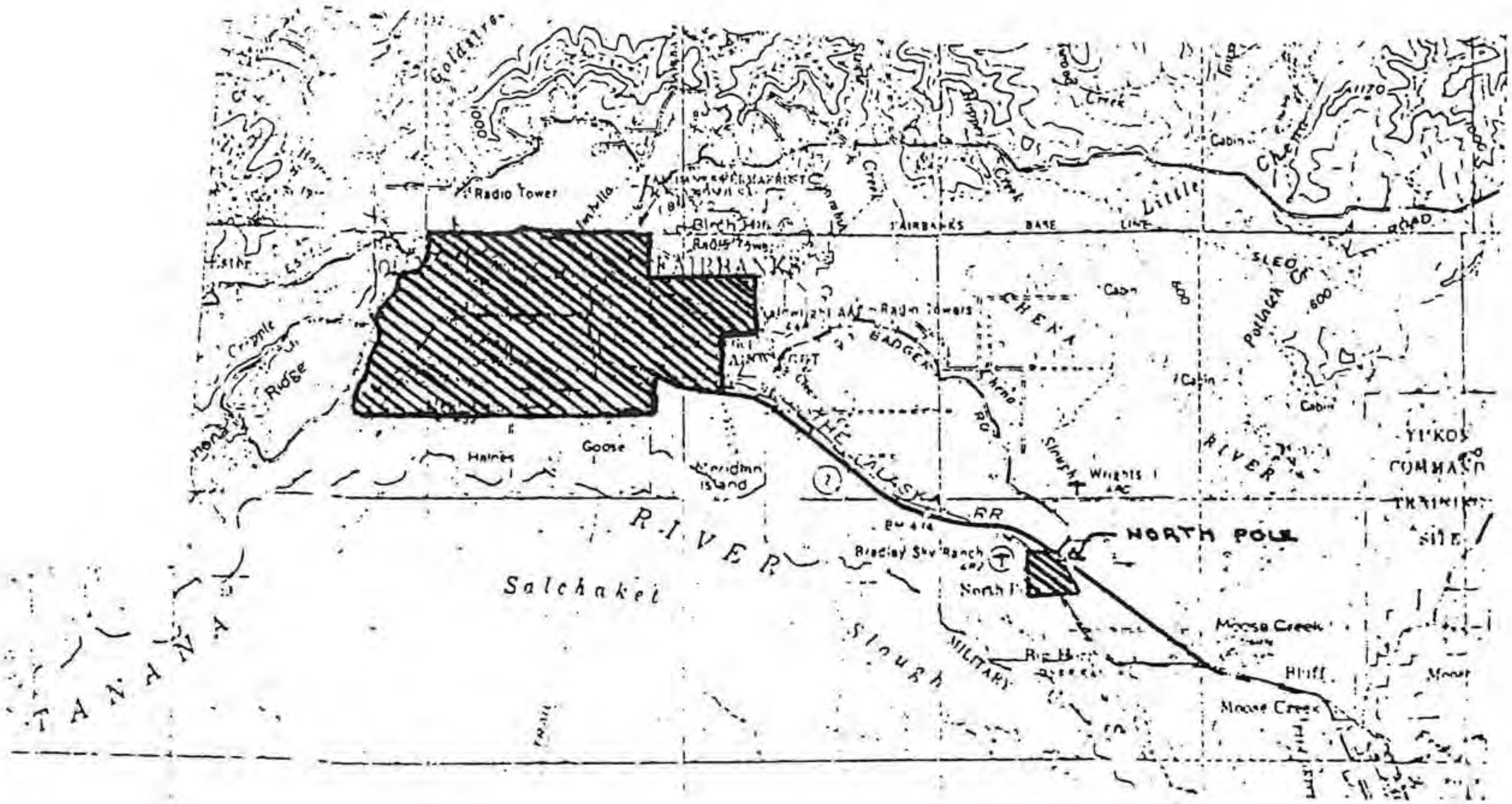
The legal authority for establishing local air pollution control programs is found in Alaska Statutes 46.03.210 LOCAL AIR POLLUTION CONTROL PROGRAMS. The Fairbanks North Star Borough's air pollution control regulations cover open burning, visible emissions from stationary sources, and emergency procedures. These regulations have not undergone any major revisions in the past several years.

2. Nonattainment Boundaries

As required under the 1977 Clean Air Act Amendments that portion of the Fairbanks North Star Borough which has shown past violations of the National Ambient Air Quality Standard for carbon monoxide has been designated as being in nonattainment of the carbon monoxide standard. Boundaries for the nonattainment area have been established (Figure C.2-a). These boundaries are subject to change as more air quality data is collected from the Fairbanks area. Presently most of the Fairbanks and North Pole urban areas and the Fort Wainwright military post are included in the nonattainment area. The legal description of the nonattainment area is as follows:

> Township 1 South, Range 1 West, Section 2 through 23, plus the portion of Section 1 west of the Fort Wainwright military reservation boundary and the portions of Section 24 north of the Old Richardson Highway, and west of the military reservation boundary to the south of the Old Richardson Highway. Also, Township 1 South, Range 2 West, Sections 13 and 24, plus the portions of Sections 14 and 23 which lay south~~west~~ East of the Chena River. Also, Township 1 South, Range 1 East, Sections 2, 8 and 18, plus the portion of Section 19 which is north of the New Richardson Highway (Fairbanks and Fort Wainwright).
>
> 7
>
> Township 2 South, Range 2 East, those portions of Sections 9 and 10 which lay south~~east~~ west of the New Richardson Highway (North Pole).

The air quality planning area can be different from the actual nonattainment area. For the purposes of obtaining a more accurate emission inventory for the area, the boundaries were adjusted slightly to coincide with existing transportation planning boundaries. This greatly reduced the work necessary to quantify vehicle emissions from the study area.




·cale: 1" = 4 miles

Figure C.2-a Fairbanks Nonattainment Boundaries

3. Air Quality Emissions Data

Emissions Inventory

A comprehensive emission inventory for the 1980 SIP submission was prepared for the study area and is available at the Borough or DEC. It is contained in the Fairbanks North Star Borough Air Quality Attainment Plan, Volume II, 1982. This inventory consists of two parts; a point source inventory and an area source inventory. The seasonal climatic variations result in large changes in monthly carbon monoxide emissions. Therefore, it is necessary to document these emissions for each month rather than on just an annual basis. The inventory contains a monthly listing.

Emissions from all point sources were calculated by multiplying the monthly fuel usages by the appropriate emission factors (obtained from EPA's AP-42 handbook). Area source emissions come from three principal sources; motor vehicles operations, aircraft operations, and business and residential heating fuel consumption. Motor vehicle emissions can be separated into three categories; start-up emissions, parking lot emissions, and stable-mode trip emissions.

A computerized traffic model operated by the Alaska Department of Transportation and Public Facilities was utilized to generate total vehicle mileage counts for all roadway segments throughout the nonattainment area. Vehicle miles traveled (VMT) figures were then calculated for each FMAT zone. These figures were then multiplied by the appropriate emission factors to obtain stable mode automobile originals from each FMAT zone. These data were used to calculate automobile start-up emissions and parking lot emissions. Emissions from aircraft operations were calculated by multiplying landing-takeoff (LTO) cycles obtained from the Fairbanks International Airport and the Fort Wainwright Military Airfield by appropriate emission factors contained in AP-42. Business and residential heating fuel consists of three primary types; fuel oil, coal, and wood. Emissions from the combustion of all three types of fuel were calculated similarly; an estimate of the actual fuel burned in each of the FMATS zones was multiplied by the appropriate emission factor. Table C.3-a shows the contribution of each type of source to the total emission burden for the entire nonattainment area.

The city of Fairbanks was established in the early 1900s as a trading post serving gold prospectors in the area. During the first part of this century the population peaked and waned according to the price and availability of gold. During the 1940s the Alaska Highway was completed and this, plus increased military activity in the area due to World War II, combined to cause considerable growth.

Continued military spending and increasing governmental growth resulted in more economic activity and population growth in the 1950s. By 1960 the population of the Fairbanks Census District had grown to 43,412. In the 1960s the military influence in the Fairbanks area leveled off while increased oil exploration in Northern Alaska accounted for a 15% increase in the population during the decade. During the 1970s the construction of the trans-Alaska oil pipeline resulted in a large population influx into this area which peaked in 1976 at 81,073. With completion of the pipeline the population fell dramatically to 62,064 by 1979.

Table C.3-a

1979 Areawide CO Emissions

| Source Type | | | |
|---|---|---|---|
| POINT SOURCES | | 182 | 0.3% |
| Vehicle Start-up | 22406 | | 40.7 |
| Vehicle Parking Lot Activity | 17387 | | 31.5 |
| Vehicle Travel | 13043 | | 23.7 |
| Vehicle Operation Subtotal | | 52837 | 95.9 |
| Aircraft Fuels | | 1006 | 1.8 |
| Fuel Oil Combustion | 57 | | 0.1 |
| Coal Combustion | 23 | | 0.1 |
| Wood Combustion | 1012 | | 1.8 |
| Heating Fuels Subtotal | | 1092 | 2.0 |
| AREA SOURCES | | 54935 | 99.7 |
| TOTAL EMISSIONS | | 55117 | 100.0% |

The potential construction of the natural gas pipeline through the Fairbanks North Star Borough will have a significant impact on population growth within the nonattainment area. Because of the uncertainty of a construction date for the pipeline it is difficult to accurately assess that impact. In their population projection ADOT & PF assumed that the construction of the pipeline will begin in 1981 and be completed by 1983. Northwest Pipeline Company estimates that a labor force of 7000 will be employed during the peak construction period. For every temporary construction job it is estimated that 0.34 permanent positions will be created in the Fairbanks area. Additionally the pipeline will create a permanent work force of 650. Each of these permanent pipeline jobs is estimated to create an additional 0.5 positions. Adding these permanent positions to the base population for 1987 gives a revised 1987 population of 50,389 within the FMATS study area.

Additional assumptions which affect population projections within the nonattainment area include:

° Other than the gas pipeline construction only moderate activity will take place in oil, gas and agricultural development in this area during the forecast period.

° The military population will remain unchanged during this period.

° The impact of the University of Alaska will increase in direct proportion to the Fairbanks population.

° Any state or local government land disposal programs will have no effect on the population within the study area.

If any of these assumptions are proven invalid at a later date the growth rate of this area would change. These assumptions represent ADOT & PF's best estimate at this time; however, they are revising them based on the latest Northwest Gas Pipeline projections.

At present there are no 201 or 208 water quality programs within this area so no consistency determination was required between population projections used in those programs and the estimates used herein.

Although there was a significant decrease in population from 1976 to 1980 it appears that vehicle miles traveled within the non-attainment area did not decrease correspondingly. An analysis by ADOT & PF showed that monthly traffic volumes across the Chena River Screenline have remained fairly constant over the same period. Since approximately 1/3 of all trips made within the nonattainment area cross this screenline these monthly volumes should be an excellent indicator of total miles traveled.

In addition to the decrease in population during this time period there was a dramatic increase in gasoline prices and the local transit system showed a five-fold increase in ridership. It is therefore surprising that traffic volumes remained constant.

ADOT & PF completed a land use inventory in 1978. This inventory was used to project future years population by use of housing density figures and vacancy rates. A civilian population projection of 36,377 for the entire FMATS study area for 1978 was obtained by this means. This projection was compared to two other independent population estimates and agreed within 2.5% of both figures.

The historical growth rates from 1970 to 1978 for various sectors of the Borough include rates of 3.78% for the entire Borough, 3.0% for the FMATS study area, and 1.67% for the City of Fairbanks. Averaging these rates give an annual growth rate of 2.8%. This is the figure that was used by ADOT & PF to represent future annual growth within the FMATS area excluding external factors such as the gas pipeline construction. Using this growth rate the base population for 1987 is projected to be 46,641.

Emission Reduction Target

The 1979 emissions inventory showed an annual areawide total of 55,117 tons of carbon monoxide. Therefore, in order to reach attainment emissions would have to be reduced to 55,117 x (1.0 - 0.452) = 30,204 tons. Projected 1987 emissions are 38,226 tons so 8,022 additional tons of CO must be eliminated to attain the 9ppm standard. This is equivalent to an 21.0 percent reduction in projected 1987 emissions. Therefore, 21.0 percent is the figure used as the design value for this attainment plan.

4. Carbon Monoxide Monitoring Network Plan

A critical part of the entire attainment process is the establishment of a feedback mechanism to monitor the success of the attainment plan. Progress toward attainment will be monitored in three primary areas; ambient CO concentrations, surveillance data from in-use vehicles, and I/M program effectiveness.

Ambient carbon monoxide data will continue to be collected at the Borough's downtown (SAROAD SITE IDENTIFICATION NO. 020160014G01) and residential area (SAROAD NO. 020160020G01) monitors. This data will be compared to the expected reductions in CO concentrations to determine progress in ambient reductions.

Because of the uncertainties in projections of emissions from future-year vehicle fleets, there is a strong possibility that the 1987 emission levels may be overpredicted. Therefore, a system will be set up to obtain EPA surveillance data on in-use vehicles and an attempt made to use such data to update the 1987 projections on a yearly basis.

The data generated at the inspection facilities in the I/M program will be collected, and program effectiveness will be calculated using these data.

5. Transportation Control Strategies

The Clean Air Act contains a list of nineteen strategies which nonattainment areas are required to consider for inclusion in their air quality attainment plan. These strategies, along with some developed locally, were examined for their applicability to the Fairbanks problem. After initial rejection of the grossly unsuitable strategies it was decided to perform an in-depth analysis on the following strategies.

° Transportation system management plan
° Transit plan
° Parking management plan
° Electric preheater usage at warmer temperatures
° Automatic starting devices
° Carpooling program
° Inspection and Maintenance (I/M) program
° Low temperature automotive emissions standard
° Idling restrictions
° Gasohol and other alternative fuels
° Restricted delivery hours
° "Do Nothing"

The following strategies were initially rejected.

° Bus preemptions of traffic signals
° Traffic flow changes during certain time of day.
° Light rail transit
° Fringe parking (park and ride)
° Heavy-duty vehicle restrictions
° Selective vehicle entry
° Vapor recovery
° Bicycle lanes and storage facilities

The urban population of the Fairbanks area is less than 50,000 people. We are dealing with a small city that has a big city problem; i.e. high ambient carbon monoxide concentrations during the winter months. Therefore, some of the big city strategies just are not practical in Fairbanks and would have very small air quality benefits. Strategies rejected for these reasons included the bus preemption of traffic signals, the traffic flow changes during the day, light rail transit and fringe parking (park and ride). In addition, both the light rail transit and the park and ride strategies would be extremely costly to implement.

Since most of the carbon monoxide problem in Fairbanks is due to cold-start automobile emissions (they account for more than sixty percent of the wintertime CO emissions), strategies which only reduce the warm idle emissions would have very small air quality benefits. The fringe parking strategy would also fall in this category.

Heavy-duty vehicle restrictions were rejected since the current truck routes and the resticted delivery times strategy under review will achieve the same effect. Selective vehicle entry will be considered as a component of a vehicle-free zone strategy.

Vapor recovery strategies pertain only to areas with a hydrocarbon pollution problem. Therefore this strategy was rejected for the Fairbanks carbon monoxide attainment plan. Additionally bicycle lanes and storage facilities were rejected as a strategy because the use of bicycles is not feasible during the period of the year when Fairbanks experiences violations of the carbon monoxide standard, i.e. in the wintertime.

Upon completion of the analysis of the individual control measures five strategy packages were developed. These packages contain the following individual control measures, respectively.

<u>Package 1</u>

Transit
Parking Management
Electric Preheaters
Carpools
I/M
Idling Restrictions
Restricted Delivery Hours

<u>Package 2</u>

Transit
Parking Management
Carpools
I/M
Idling Restrictions
Gasohol
Restricted Delivery Hours

<u>Package 3</u>

Transit
Parking Management
Electric Preheaters
Carpools
I/M
Idling Restrictions
Gasohol
Restricted Delivery Hours

<u>Package 4</u>

Electric Preheaters
Gasohol

<u>Package 5</u>

Transit
Parking Management
Electric Preheaters
Gasohol

These packages were then analyzed for cost, transportation, energy usage, air quality, institutional, and socio-economic impacts. These analyses are available at the Borough and DEC. Package 1 does not result in nearly enough reduction to reach attainment so it has been rejected. An analysis of the costs of the other packages show that the annual cost for these packages would range from 3.3 to 3.9 million dollars per year.

CO reductions are estimated to be 20.8 % for Package 2, 25.0% for Package 3, 19.9 % for Package 4, and 20.0% for Package 5. These estimates assume no reduction in cold-start emissions due to an I/M program. This assumption was made because the results of the State of Alaska's METFac research program on I/M effectiveness was unknown and 0% effectiveness represented the most conservative estimate.

Because of the uncertainty over I/M effectiveness, it was also decided to analyze a package consisting solely of an I/M strategy. This package would have an annual cost of approximately $535,000 per year and a selected stringency factor adjusted to attain the design value of 21.0%. The results of the METFac study program do show that an I/M program could achieve an overall emissions reduction of at least 21%, depending on the stringency factor chosen. Therefore, this package is a viable alternative to the other packages.

The cost analysis shows a wide disparity between Package 6 (I/M program only) and the other packages. Although no definition exists, to our knowledge, of what is considered reasonable (in terms of "reasonably available control measures"), it is felt that excessive cost is one measure of unreasonableness. For this reason the mandatory control measures, other than an I/M program, are rejected as unreasonable. This is especially true since the presently available data shows that the Fairbanks area will attain the standard if an I/M program is the only mandatory strategy implemented.

However, it should be pointed out that the I/M program will not be the only effort aimed at reducing areawide CO concentrations. Other measures are currently underway to help reduce such emissions. The Borough transit system will continue to be operated, and expanded as needed. The City of Fairbanks and the State of Alaska have instituted a number of traffic flow improvements over the past few years, and will continue to do so. The 1987 emission projections assume that by that date two major highway projects will be constructed within the current nonattainment area. These projects, the 30th Avenue Expressway and the Geist Road Extension, are designed to relieve the present and projected traffic congestion problems on the two major east-west routes currently in service within this area. Because these projects will improve traffic flow they should not worsen carbon monoxide levels within the nonattainment area and may lead to an improvement in air quality.

Additionally, the City of Fairbanks is continuing work on a district heating system which will reduce CO emissions from residential heating. Such a system will significantly retard the trend toward residential wood combustion (RWC) in the Fairbanks area and could therefore result in a substantial reduction in CO from residential heating sources.

The Borough will also continue an extensive effort to reduce cold-start CO emissions by preheating vehicles at warmer temperatures. As part of this program, the Borough will begin to turn on its electrical receptacles at +20°F and will actively seek to have all other government agencies in the Fairbanks area to do likewise. This effort will be accompanied by a significant public eduction program to get people to voluntarily plug-in beginning at +20°F.

Basic Transportation Needs

This attainment plan will not restrict the mobility of the people of the Fairbanks area. In order to insure that there is no interference with mobility, the Borough's transit system will continue to be operated to provide an alternative mode of transportation to anyone wishing to use the system. The system is currently underutilized and has ample room for significant increases in ridership. The Borough is committed to continued funding of the transit system to provide such an alternative to other modes of transportation.

6. Reasonable Further Progress

The concept of Reasonable Further Progress (RFP) is intended to insure that a nonattainment area will begin reducing pollutant levels immediately after plan adoption and will continue to do so until attainment is reached. Therefore, RFP requires nonattainment areas to achieve a per year reduction at least equal to the reduction attained by drawing a straight line from the base year concentration to the 9 ppm concentration in 1987. For Fairbanks, the required straight line reduction is shown in Table C.6-a. This table also shows the reductions in CO emissions (in tons/year) required to achieve attainment. Table C.6-b shows the expected yearly reductions resulting from both the I/M strategy and the lower emissions from future model year vehicles.

The Fairbanks North Star Borough has provided the following information concerning Reasonable Further Progress and their planning process:

FAIRBANKS NORTH STAR BOROUGH
ATTAINMENT PROGRESS

During the period of July 1, 1982 to June 30, 1983 the Fairbanks North Star Borough continued to progress toward implementation of a vehicle emissions inspection and maintenance program. This progress can be shown at two levels; policy and technical.

At the policy level the Borough Assembly passed two resolutions (copies attached) which, taken together, endorsed the concept of a mandatory I/M program and created a committee to develop and implement such a program. These resolutions also stated that implementation of an I/M program would not commence until receipt of initial funding from the State of Alaska. This, coupled with the State administration's decision not to provide such funding, has resulted in the present status of a non-implementable I/M program.

However, work is proceeding at the technical level through the Committee on I/M Program Development. The Committee has held a number of meetings (minutes attached) and will be working closely with the contractor who the State will be retaining to develop I/M program designs for both Anchorage and Fairbanks. As part of this program design the committee will develop a financing scheme acceptable to the Borough Assembly.

The committee has chosen to leave the decision concerning a centralized or decentralized program to the Assembly. Design is proceeding for both programs.

Table C.6-a REASONABLE FURTHER PROGRESS-REQUIRED REDUCTIONS

| YEAR | CONCENTRATION | EMISSIONS |
|---|---|---|
| 1979 | 15.6 | 55,117 |
| 1980 | 14.8 | 52,002 |
| 1981 | 13.9 | 48,888 |
| 1982 | 13.1 | 45,773 |
| 1983 | 12.3 | 42,659 |
| 1984 | 11.5 | 39,545 |
| 1985 | 10.6 | 36,430 |
| 1986 | 9.8 | 33,315 |
| 1987 | 9.0 | 30,201 |

*Second highest eight-hour average

Table C.6-b EXPECTED REDUCTION

| YEAR | I/M PROGRAM | ANNUAL EMISSIONS (TONS OF CO) | SECOND-HIGHEST CONCENTRATION |
|---|---|---|---|
| 1979 | NONE | 55,117 | 15.6[1] |
| 1980 | NONE | 53,758 | 16.0[1] |
| 1981 | NONE | 52,405 | 14.9[1] |
| 1982 | NONE | 49,966 | 14.3 |
| 1983 | NONE | 47,168 | 13.6 |
| 1984 | PART OF YEAR | 44,703 | 13.0 |
| 1985 | FULL PROGRAM | 34,093 | 9.9 |
| 1986 | FULL PROGRAM | 31,819 | 9.4 |
| 1987 | FULL PROGRAM | 29,865 * | 8.9 |

[1] Actual measured concentration

By: B. B. Allen
Jerry Norum
Paul Chizmar
Introduced: 04/28/83
Amended: 05/02/83
Adopted: 05/02/83

RESOLUTION NO. 83-19

A RESOLUTION AUTHORIZING THE DEVELOPMENT OF A VEHICLE EMISSIONS INSPECTION AND MAINTENANCE PROGRAM FOR THE FAIRBANKS NORTH STAR BOROUGH

WHEREAS, the Clean Air Act requires that the National Ambient Air Quality Standards be attained by 1987, at the latest; and

WHEREAS, the National Ambient Air Quality Standard for carbon monoxide is designed to protect susceptible members of the general population from harmful health effects of carbon monoxide; and

WHEREAS, the Fairbanks area exceeds the National Ambient Air Quality Standard for carbon monoxide on occasion; and

WHEREAS, the Fairbanks Air Quality Attainment Plan has been presented to the Fairbanks North Star Borough Assembly; and

WHEREAS, a mandatory Vehicle Emissions Inspection and Maintenance (I/M) program has been identified in Alaska's State Implementation Plan as the only currently available and economically feasible method to attain the National Ambient Air Quality Standard for carbon monoxide by 1987; and

WHEREAS, legislation authorizing and implementing the selected method for attaining the National Ambient Air Quality Standard must be enacted by July, 1 1983, or such federal sanctions may be implemented; and

WHEREAS, the State of Alaska, in the past, has indicated a position of responsibility for a portion of the initial capital cost, such as land, building and equipment, initial program start up costs for planning and development technician training and public information:

NOW, THEREFORE, BE IT RESOLVED By the Fairbanks North Star Borough Assembly, that the following actions be recognized and implemented:

1. Recognizing the need for a plan that demonstrates attainment, the concept of a mandatory Inspection and Maintenance (I/M) program is approved.

2. The Borough will be responsible for development, implementation, and management of this program.

3. The Assembly will develop criteria for the program and the administration shall develop a fiscal note that will be forwarded to the State of Alaska.

4. The program shall be developed so as to allow for cancellation in the event that:

   a. another, more desirable, method of attainment is implemented, or

   b. attainment is reached and can be maintained in the absence of this program.

5. The Borough administration will submit an annual report to the Assembly by July 1st of each year which will evaluate the program's effectiveness and the carbon monoxide trends in the Fairbanks area. This report will be accompanied by a recommendation on whether or not to continue the program.

6. The I/M program will be cancelled on December 31, 1988, unless reenacted by the Borough Assembly prior to that date.

7. The implementation of this I/M program shall commence upon receipt of the initial funding from the State of Alaska.

PASSED AND APPROVED THIS 2ND DAY OF MAY,1983.

Jerome W Nolan

Presiding Officer

ATTEST:

Gary J. Patrick

Clerk of the Assembly

Resolution No. 83-19
Page 2 of 2

By: B. B. Allen
Introduced: 03/03/83
Amended: 03/03/83
Defeated: 03/03/83
Reconsidered: 03/10/83
Amended: 03/10/83
Adopted: 03/10/83

RESOLUTION NO. 83-11

A RESOLUTION AUTHORIZING THE DEVELOPMENT OF AN AIR QUALITY ATTAINMENT PROGRAM FOR THE FAIRBANKS NORTH STAR BOROUGH

WHEREAS, the Clean Air Act requires that the National Ambient Air Quality Standards be attained by 1987, at the latest; and

WHEREAS, the Clean Air Act further requires the U.S. Environmental Protection Agency and the U.S. Department of Transportation to implement certain federal sanctions against those areas which do not attain those standards by that date; and

WHEREAS, the National Ambient Air Quality Standard for carbon monoxide is designed to protect susceptible members of the general population from harmful health effects of low levels of carbon monoxide; and

WHEREAS, the Fairbanks area exceeds the National Ambient Air Quality Standard for carbon monoxide; and

WHEREAS, the Fairbanks Air Quality Attainment Plan has been presented to the Assembly; and

WHEREAS, legislation authorizing and implementing the selected method for attaining the National Ambient Air Quality Standard must be enacted by July 1, 1983, or such federal sanctions will be implemented.

NOW, THEREFORE, BE IT RESOLVED by the Assembly of the Fairbanks North Star Borough that a committee shall be formed to provide local input into the development and implementation of the plan. This committee will consist of two members of the Borough Assembly appointed by the Presiding Officer; two members of the Borough's Pollution Control Commission to be appointed by the Borough Mayor and confirmed by the Borough Assembly; and three members of the general public, one of which will reside in the City of Fairbanks, one from the City of North Pole and one at large residing in the borough to be appointed by the Borough Mayor and confirmed by the assembly.

PASSED AND APPROVED THIS 10th DAY OF MARCH, 1983.

Bruce W. Wammell
Presiding Officer

ATTEST:

Mary J. Patrick
Clerk of the Assembly

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING
JUNE 15, 1983
5:30 PM
ENGINEERING CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
Frank Abegg, Pollution Control Commission
John Hargesheimer, Pollution Control Commission
Ken Brewer
Steve Kailing (for Lee Leonard)

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities

Others:

Jack Cotts

Items of Discussion:

1. Committee Organization

The committee members discussed the selection of a chairperson and decided to postpone such action until the other two members of the committee are appointed and in attendance. Until that time, Donald Moore will serve as chairman.

2. Decision on Centralized/Decentralized I/M Program

It was moved by Frank Abegg, and seconded by John Hargesheimer, that the committee adopt a resolution in favor of a centralized I/M program. Discussion ensued on the relative merits of the two types of programs. Robert Blake stated that he was in favor of a centralized program due to the size of the Fairbanks vehicle fleet. Ken Brewer also indicated a centralized program would be better.

Donald Moore asked the committee members whether they wished to have some proponents of a decentralized program address the committee. After discussion, it was agreed that the staff should invite representatives from the automobile dealerships to the next meeting.

The next meeting was scheduled for Wednesday, June 22nd, at 5:30 pm.

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING

June 22, 1983

NOEL WEIN LIBRARY CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Ken Brewer
Steve Kailing (for Lee Leonard)

Staff Present:

Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Kelly McMullen, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities
Charlie Howard, Federal Highway Administration

Others:

Ralph Seekins, Seekins Ford Lincoln Mercury
Robbie Ginther, Tip Top Chevrolet
John Emmel, Gene's Auto Service
Van Bowman, A & B Auto Sales
Tom Alexander, A & B Auto Sales
John Hill, Auto Service Company
Don Seelinger, Don's Union
Ron McMahan, American Tire Warehouse
Jim Looney, Jim's College Texaco
Richard Entwhistle, Sunshine Rae Motors
Jack Coutts

Items of Discussion:

Representatives of private automobile repair facilities in the Fairbanks area had been invited by the committee to attend the meeting to discuss the option of a centralized/decentralized I/M program. A general discussion ensued between staff, the committee, and these representatives. The concensus of the repair industry is that:

1. They prefer a decentralized program.

2. There is adequate capacity in the existing facilities to conduct a decentralized program.

The next meeting will be held on Wednesday, July 6th, at 5:30 p.m., in the Engineering Conference Room.

cc: Committee Members
Tom Moyer, D.E.C.
John Martin, D.O.T./P.F.
Mayor Allen

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

COMMITTEE ON I/M PROGRAM DEVELOPMENT

COMMITTEE MEETING

JULY 6, 1983

BOROUGH ENGINEERING CONFERENCE ROOM

Committee Members Present:

Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Frank Abegg, Pollution Control Commission
Ken Brewer
Lee Leonard

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, Alaska Department of Environmental Conservation
John Martin, Alaska Department of Transportation/Public Facilities
Kathy Pazera, Environmental Protection Agency/Alaska Operations Office

Others:

Jack Coutts

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Items of Discussion:

1. Committee Organization

   Selection of a chairperson was again deferred until a second assemblyperson was in attendance. Donald Moore will continue as acting chairman.

2. Centralized/Decentralized Program

A discussion ensued on the relative merits of centralized and decentralized programs. The committee discussed the potential objectives of an I/M program in the Fairbanks area and how well each type of program achieved those objectives. Potential objectives included:

a. designing program to reduce ambient carbon monoxide levels to attain the federal standard;

b. designing program most acceptable to the public, with the greatest personal convenience;

c. designing lowest cost program;

d. designing program which requires the least government involvement; and

e. designing program which gives adequate data base on emission reductions and other program parameters.

Issues pertinent to the centralized/decentralized question were also discussed. These included:

a. whether or not, in a decentralized program, to allow vehicles to be inspected and repaired at the same licensed facility;

b. which type of program would be most convenient to the public, based on the answer to (a);

c. the results of ADEC's Air Quality survey, as they related to this question; and

d. how well a decentralized program would fit with the public's winterization habits.

After much discussion Mr. Blake moved that the committee recommend a centralized I/M program to the Borough Assembly. This motion was seconded by Mr. Leonard. The committee approved the motion 4-1 with Mr. Brewer dissenting.

3. ADEC I/M Program Design Study Status

Richard Joy stated that the state had received four proposals in response to their Request for Proposals for design of I/M programs in Fairbanks and Anchorage. He and Tom Moyer will take part in an evaluation session next week in Anchorage to select the best proposal.

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The committee agreed to meet again on Wednesday, July 20th, at 5:30 p.m., in the Borough Engineering Conference Room. Agenda items will include a presentation by staff of the contents of the selected proposal.

Committee on I/M Program Development

COMMITTEE MEETING

September 14, 1983
4:30p.m.

Engineering Conference Room

Committee Members Present:
Robert Blake, Borough Assembly
Mike Ribar, Borough Assembly
John Hargesheimer, Pollution Control Commission
Frank Abegg, Pollution Control Commission

Members Absent:
Ken Brewer
Lee Leonard
Bill Green

Staff Present:
Heather Stockard, FNSB
Richard Joy, FNSB
Len Verrelli, ADEC, Juneau
Tom Moyer, ADEC, Fairbanks
John Martin, ADOT/PF

Others:
Gary Rubenstein, Sierra Research
Jack Coutts

Items of Discussion:
The Committee again discussed the need for a chairman, Robert Blake nominated Mike Ribar for the position. This was seconded by John Hargesheimer. Mike was elected chairman by a unanimous vote. The committee then discussed the reconsideration of the type of I/M program to be considered. After much discussion Robert Blake moved that the committee recommend a centralized-type program to the Borough Assembly. This was seconded by Frank Abegg. The committee unanimously (4-0) approved this recommendation. Reasons for this recommendation include:

1. A centralized program would be easier to stop at any time in the future.

2. A centralized program will do the best job of collecting a valid, adequate data base regarding the effectiveness of an I/M program in the Fairbanks area.

3. A properly designed and operated centralized program will be the most effective type of I/M program in reducing CO emissions in the Fairbanks area.

4. A centralized program can be designed so that no capital outlays are required by any level of government to construct inspection facilities. The Contractor hired to operate the program would also be responsible for acquiring such facilities.

Mike Ribar then asked that Sierra Research furnish the committee with a preliminary list, by next Wednesday, September 21st, of future decisions which will need to be made during the program design. The next committee meeting will be held on Thursday, September 29th, at 4:30p.m., in the Engineering Conference Room. The purpose of this meeting will be to discuss this list.

RJ/ld

## VEHICLE INSPECTION AND MAINTENANCE PROGRAM RECOMMENDATIONS

prepared by

COMMITTEE ON I/M PROGRAM DEVELOPMENT

Mike Ribar, Borough Assembly
Robert Blake, Borough Assembly
John Hargesheimer, Borough Pollution Control Commission
Frank Abegg, Borough Pollution Control Commission
Ken Brewer
Lee Leonard
Bill Green

### OBJECTIVES

I. Design program to reduce ambient carbon monoxide levels to attain the federal carbon monoxide standard.

II. Design program most acceptable to the public, with the greatest personal convenience.

III. Design lowest cost program.

IV. Design program which requires the least government involvement.

V. Design program which gives adequate data base on emission reductions and other program parameters.

### RECOMMENDATIONS

I. The program should be a centralized-type program involving one central inspection facility owned and operated by a private contractor.

Reasons:

1. A centralized program would require less government involvement than a decentralized program.

2. An adequate data base would be easier to ensure in a centralized program.

3. A properly designed and operated centralized program will be the most effective in reducing CO emissions in the Fairbanks area.

4. A centralized program would be easier to stop at any time in the future.

Working Draft

Date of Recommendation: July 6, 1983

Voting Record:

For: Robert Blake, John Hargesheimer, Frank Abegg, Lee Leonard

Opposed: Ken Brewer

Reconsidered: September 14, 1983

Voting Record (Reconsideration):

For: Robert Blake, Mike Ribar, Frank Abegg, John Hargesheimer

Opposed: None

Absent: Ken Brewer, Lee Leonard, Bill Green

fairbanks north star borough
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Committee on I/M Program Development

COMMITTEE MEETING

September 29, 1983

4:30 P.M.

Engineering Conference Room

Committee Members Present:

Mike Ribar, Borough Assembly
Robert Blake, Borough Assembly
John Hargesheimer, Pollution Control Commission
Ken Brewer
Lee Leonard
Bill Green

Members Absent:

Frank Abegg, Pollution Control Commission

Staff Present:

Donald Moore, Fairbanks North Star Borough
Heather Stockard, Fairbanks North Star Borough
Richard Joy, Fairbanks North Star Borough
Tom Moyer, ADEC, Fairbanks

Others:

Bill Allen, Borough Mayor
Jack Coutts
Margaret Nelson, Fairbanks Daily News Miner

Items of Discussion:

Mayor Allen made a presentation to the Committee outlining the basic framework of his proposal for a mandatory decentralized I/M program in the Fairbanks area. A general discussion then ensued concerning the proposal, independent of the centralized/decentralized issue. The Committee unanimously agreed that they supported the other aspects of the Mayor's proposal, although several members felt that the technical details of the program needed to be worked out after more information was received from Sierra Research.

A long debate then ensued on the centralized/decentralized question. After much discussion, three members (Ribar, Blake, Hargesheimer) favored a centralized program while three (Green, Brewer, Leonard) favored a decentralized program. Although the Committee has formally voted twice in favor of a centralized program, Chairman Ribar ruled that, because of the large minority of members favoring a decentralized approach, this decision should be left to the Borough Assembly.

Therefore, he instructed the staff to set up a joint work session with the Committee and the Assembly, in order to address the centralized/decentralized issue.

The meeting was adjourned at 6:00 P.M.

fairbanks north star borough
p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

October 31, 1983

Mr. Leonard Verrelli
Air Program Manager
Alaska Department of Environmental Conservation
Pouch O
Juneau, Ak 99811

Dear Mr. Verrelli:

On October 27, 1983 The Fairbanks North Star Borough Assembly voted to direct the Borough administration to contract with Sierra Research to develop a decentralized Inspection and Maintenance Program for the Fairbanks area in addition to their centralized program development which is being funded by the State of Alaska. These parallel program analyses will give the Borough Assembly the maximum technical information available on which to base their ultimate decision as to program type. During this process the I/M Development Committee will continue to serve as the local technical review committee for Sierra Research's work and will provide input into the development of both centralized and decentralized program formats.

Borough staff is currently waiting on a Letter of Proposal from Sierra Research for this additional work and will then enter into a contractual arrangement with the firm. I would therefore request that the State allow Sierra to continue to work on the centralized analysis for Fairbanks and Sierra will be instructed by the Borough to begin the decentralized analysis as soon as the contractual arrangements are finalized.

Thank you for your patience and cooperation in resolving this issue. Hopefully we can now proceed to develop these programs for their submittal to the Assembly. I would anticipate action on this matter as early as February 1984.

Sincerely,

Michael Ribar, Chairman
I/M Development Committee

MR/ja

7. Conformity

The metropolitan planning organization which oversees transportation planning in the Fairbanks area is the FMATS Policy Committee. This committee also has responsibility for overseeing development and approval of the air quality attainment plan. This committee will ensure that all transportation plans conform to the attainment plan prior to their approval. The Borough technical staff will review such transportation plans prior to their consideration by the committee and will recommend for or against approval based on the conformity question. Conformance will be determined by the following procedure.

a. The plans will be reviewed for projects that qualify as Transportation Control Measures (TCM) or clearly support transportation strategies presented in the attainment plan.

b. A determination will be made if any of the proposed transportation projects will adversely affect the TCMs contained in the attainment plan.

c. Projects will not be approved which:

   ° reduce the effectiveness of the planned TCMs; and

   ° delay further progress in reaching attainment by 1987.

8. Modeling

Design Concentration

In order to determine the reduction in projected emissions required to reach attainment by 1987 a simple rollback model is used. The basic premise of such a model is that ambient pollution concentrations are directly proportional to emissions from the area in which the concentrations are measured. This technique should be particularly valid for wintertime Fairbanks conditions since the absence of significant wind fields and the presence of very strong temperature inversions result in minimal pollutant transport into or out of the area.

Analysis of the data reveals the following second-highest annual maximum eight hour carbon monoxide concentrations for 1979, 1980 and 1981.

| | | |
|---|---|---|
| 1979 | - | 15.6 ppm |
| 1980 | - | 16.0 ppm |
| 1981 | - | 14.9 ppm |

In order to calculate the correct second-high concentration to be used in figuring the design value, the following equation is used:

(2nd high CO conc.) (relative emission factor) (relative growth factor)=design conc.

Since 1979 is the year of the baseline emissions inventory, the relative growth and emission factors for that year will equal 1.0. These factors can be calculated for the other two years by the use of indicators which represent these factors. Composite emission factors, from MOBILE 2, are used to calculate the relative emission factor. Annual average daily traffic counts from a fixed recorder on Cushman Street at the Chena River are used to figure the relative growth factor. Thus, the following design concentrations can be calculated.

| Year | 2nd High | Emission Factor (EFyr/EF79) | Growth Factor (AADTyr/AADT79) | Design Conc. |
|---|---|---|---|---|
| 1979 | 15.6 | 1.0 | 1.0 | 15.6 |
| 1980 | 16.0 | 0.948 | 0.990 | 15.0 |
| 1981 | 14.9 | 0.903 | 1.028 | 13.8 |

EF79 = 202.15 gm/mile AADT79 = 12,615 vehicles/day
EF80 = 191.67 gm/mile AADT80 = 12,485 vehicles/day
EF81 = 182.55 gm/mile AADT81 = 12,963 vehicles/day

To calculate a design value an appropriate background concentration for the Fairbanks area must be estimated. The natural background for CO is commonly set at 1.0 ppm. Another factor which might affect the background concentration is area sources which cannot be reduced, such as residential heating sources, particularly wood stoves. An examination of the 1979 emission inventory shows residential heating sources to account for two percent of total CO emissions. This equates to about 0.3 ppm of the design concentration. Also, the City of Fairbanks currently has a district heating program in the preliminary stages which could reduce emissions from these sources. Therefore, a total background of 1.0 ppm is assumed for the Fairbanks area.

Air Quality Projection

The following equation is then used to calculate the reduction needed in 1979 emissions to attain the 9.0 ppm standard.

$$PRN = \left[ 1 - \frac{STD - B}{DC - B} \right] 100\%$$

Where:

PRN = percent reduction needed
STD = standard = 9.0 ppm
B = background = 1.0 ppm
DC = design concentration = 15.6 ppm

Therefore:

$$PRN = \left[ 1 - \frac{9.0 - 1.0}{15.6 - 1.0} \right] 100\% = 45.2\%$$

The 1979 emissions inventory showed an annual areawide total of 55,117 tons of carbon monoxide. Therefore, in order to reach attainment emissions would have to be reduced to 55,117 x (1.0 - 0.452) = 30,204 tons. Projected 1987 emissions are 38,226 tons so 8,022 additional tons of CO must be eliminated to attain the 9ppm standard. This is equivalent to an 21.0 percent reduction in projected 1987 emissions. Therefore, 21.0 percent is the figure used as the design value for this attainment plan.

Projected emissions for 1987 are contained in Table E.8-a. A more detailed description of the assumptions used to obtain those projections is in the Fairbanks air quality attainment plan. Using the method outlined above, results in a necessary reduction of 21.0% for a maximum eight-hour average by 1987. Analysis of the projected emissions shows that motor vehicles remain the overwhelming source of CO emissions within the Fairbanks nonattainment area.

Table C.8-a

1987 Areawide CO Emissions

| Source Type | | | |
|---|---|---|---|
| POINT SOURCES | | 182 | 0.5% |
| Vehicle Start-up | 15522 | | 40.6 |
| Vehicle Parking Lot Activity | 11023 | | 28.8 |
| Vehicle Travel | 8824 | | 23.1 |
| Vehicle Operation Subtotal | | 35369 | 92.5 |
| Aircraft Fuels | | 1282 | 3.4 |
| Fuel Oil Combustion | 75 | | 0.2 |
| Coal Combustion | 25 | | 0.1 |
| Wood Combustion | 1294 | | 3.4 |
| Heating Fuels Subtotal | | 1393 | 3.6 |
| AREA SOURCES | | 38044 | 99.5 |
| TOTAL EMISSIONS | | 38226 | 100.0% |

Vehicle start-ups and parking lot activity will account for over sixty-nine percent of the total areawide emissions with warm-mode vehicular traffic contributing another twenty-three percent of that total.

Although non-automotive area source emissions will increase significantly between 1979 and 1987 the total magnitude of these emissions is so small that this increase in emissions will not substantially affect the total emissions in the Fairbanks area. One area which will have to be watched closely is the emissions from residential and commercial heating with wood. Conservative estimates used to predict the growth of wood heating show that 3.4 percent of the area's CO emissions will be caused by that source by 1987. In actuality this figure may be even higher.

9. Contingency Plan

If the monitoring program shows that Reasonable Further Progress is not being made, the reason for this failure will be determined. A contingency plan, to be implemented if necessary to maintain RFP, will consist of a two-step approach. First, the I/M program will be analyzed to determine if it is feasible and desirable to increase its effectiveness. If this action is not feasible then a decision will be made to implement one of two additional strategies, either the preheater or the alternate fuel strategy.

10. Air Pollution Episode Plan

As part of our goal to protect the health and safety of inhabitants of the Fairbanks North Star Borough we have an emergency avoidance plan designed to keep high concentration of carbon monoxide from ocurring. This plan contains the following strategies.

The carbon monoxide levels monitored by the infra-red carbon monoxide analyzers at two locations - the Borough Office Building (Fourth and Lacey site) and the new State Office Building - are averaged to obtain an eight-hour carbon monoxide level for the downtown area. This mean value is used in the plan. The actions in each step of this plan are taken if the CO concentrations are expected to remain the same or rise over the next twenty-four hours.

<u>Less than 15 ppm CO</u>

During the winter months two daily forecasts are made: at 6:30 a.m. and 4:00 p.m.

- These are made on the basis of meteorological data and dispersion forecasts received from the National Weather Service and on carbon monoxide data recorded by our CO analyzers.
- These forecasts are taped onto a phone message tape and called into all the local radio stations.
- These forecasts contain the previous day's maximum eight-hour average, the current eight-hour average and the predicted eight-hour maximum for the day.

<u>15 ppm CO (alert level)</u>

- It is announced on the daily forecast that an air quality alert has been called and the public is asked to eliminate unnecessary vehicle idling and driving.
- If needed an open burning prohibition can be announced by the Environmental Services Director.
- An event log is kept for each alert episode.
- Fares on the borough transit system are eliminated for the duration of the alert.

<u>20 ppm CO</u>

- The Environmental Services Department Office is manned around the clock until the CO levels decrease.
- Persons with cardiovascular conditions are asked on the forecast to avoid congested areas.

25 ppm CO

- Either the Environmental Services director or the Environmental Engineer will be present in the forecast office.

- Personnel are dispatched into the field with portable carbon monoxide analyzers to define the boundaries of the high CO areas.

- All vehicle fleets are contacted and asked for cooperation in reducing traffic activity into the high carbon monoxide areas.

- All concerned agencies are alerted:

    - National Weather Service
    - Alaska Department of Environmental Conservation
    - U. S. Environmental Protection Agency

- The School District's Transportation Officer is notified.

- Radio stations are asked to run P.S.A.'s every fifteen minutes requesting the public to reduce vehicle idling and driving as much as possible.

30 ppm (warning level)

- Requests for voluntary actions are repeated.

- Vehicles are asked to not enter high carbon monoxide areas.

- Downtown employers and employees asked to carpool or use the transit system.

- City police asked to ticket any unattended idling vehicles within the high CO areas.

35 ppm

- The Borough mayor and other pertinent officials will direct the implementation of the following mandatory strategies in the areas where CO levels exceed 30 ppm of carbon monoxide:

    - Excuse nonessential government employees from work;
    - Order public to cease vehicle idling; and
    - Ask large employers in the areas to excuse their employees from work and to close their businesses until the carbon monoxide abates.

- A meeting of the Borough's Pollution Control Commission will be held within twenty-four hours of the issuance of any mandatory orders.

40 ppm (emergency level)

- Local actions are continued.

- EPA takes appropriate actions based on the severity of the problem.

CO Levels Decrease to Below 20 ppm and are Expected to Remain Below 20 ppm for the next 24 Hours

- Any EPA implemented strategies will be discontinued.

- Local strategies for over 20 ppm will be discontinued.

Basically this plan calls for voluntary actions to reduce CO levels during the initial alert stages. If such actions have no effect and the concentrations continue to rise then certain mandatory strategies may be implemented. Since adoption of an initial version of this avoidance plan in January, 1975 we have not gone beyond the 25 ppm step.

## D. TOTAL SUSPENDED PARTICULATE MATTER

Total Suspended Particulate Matter is discussed in Section V of this volume.

## E. ICE FOG

Ice fog is a cold weather phenomenon which occurs at temperatures of about -35°F whenever water vapor or drops are emitted into the air. However, it only becomes a problem if there are many water vapor sources within a small area, such as in Fairbanks. At such cold temperatures the water vapor, which is formed in any combustion process, almost immediately forms ice crystals which have the potential of greatly reducing visibility.

Ice fog can be generated from many sources, such as motor vehicles, home heating furnaces, power plants, municipal utilities systems, sewer treatment facilities, cooling ponds, and open sections of local rivers.

There are no national ambient air quality standards for ice fog. There also is very little quantitative data known on whether ice fog is a substantial health hazard, although it certainly presents a safety hazard when it occurs.

The State has the authority to require potential stationary sources in areas of potential ice fog to obtain a permit to operate and to reduce water emissions (18 AAC 50.090).

## F. OPEN BURNING

Control of open burning incidences for smoke pollution is the responsibility of the Department. Open burning is defined as "the burning of a material which results in the products of combustion being emitted directly into the ambient air without passing through a stack or flare." All open burning in the state, whether requiring written approval from the Department or not, must be done in a way that maintains maximum combustion efficiency throughout the burning period. Achieving maximum combustion efficiency means the following are attempted:

- material is dried through covering or storage;
- noncombustibles are separated before burn;
- natural or artificially induced draft is included;
- combustibles are separated from grass layer or peat layer (a noncombustible firebreak is made to contain the fire); and
- combustibles are not allowed to smolder (burn and smoke without flame).

Open burning is prohibited if the material burned is:

- pesticides, halogenated organic compounds, cyanic compounds or polyurethane products burned in a way that gives off toxic or acidic gases or particulates; or
- putrescible garbage, animal carcasses, or petroleum-based materials burned in a way that causes odor or black smoke to have an adverse effect on nearby persons or residences.

Open burning at landfills is also controlled by solid waste disposal regulations, 18 AAC 50.060.

Who needs written approval?

Certain types of open burning require written approval from the Department prior to the incident. These are the burning of

- petroleum-based materials or other materials in a way that gives off black smoke, including fire fighter training;
- material from land-clearing operations for agricultural or development purposes of 40 acres or greater, based on the total amount of land to be cleared over the life of the project; or
- material for the management of forest land, vegetative cover, fisheries of wildlife habitat, except burning to combat a natural wildfire.

If human safety may be endangered or to protect the environment for example during an oil spill about to enter a watershed, verbal approval is adequate with a followup letter.

Approval application requirements

Persons seeking approval to open burn may be required to submit a plan addressing the following smoke control concerns:

1. Location and inclusive dates considered for fires to the extent possible. The plan should state the expected duration the fire would be allowed or expected to burn.

2. The location of all sensitive population centers, ground travel routes, airport or other activities that should not be impacted by smoke.

3. Where the weather forecasts will be obtained and how they will be used to prevent smoke problems.

4. How weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition.

5. What the considerations are for visibility impacts.

6. How coordination with air quality authorities having jurisdiction will be accomplished.

7. The procedures that will be used to coordinate with other concerned agencies such as the FAA, State Troopers, military, adjacent land managers, etc.

8. How the public will be informed prior to, during and after the burning.

9. What will be done to validate predicted smoke dispersal conditions such as a test fire, smoke bomb, etc.

10. What will be done to validate predicted smoke dispersal conditions such as a test fire, smoke bomb, etc.

11. For fires other than for fire fighter training an evaluation of alternatives to open burning, demonstrating open burning is the only feasible alternative.

Persons with approved open burning plans should work directly with the National Weather Service Fire Weather Forecasters to obtain spot weather forecasts for expected smoke conditions at each specific burn site. The forecaster should be requested to give the reliability of the forecast. Persons with approval must curtail their fire if their portion of the airshed is becoming overloaded or local weather factors would create smoke problems, even though no other restrictions have been imposed, i.e., wind moving directly into sensitive areas, inversions, etc. The final responsibility for smoke control problems rests with applicant.

It is also the responsibility of the applicant to show all possible alternatives to open burning have been analyzed and why open burning is the only feasible alternative.

Written approval is not automatic but must be evaluated for conformance with these guidelines:

FIRE TRAINING

Fire fighter training must conform to 18 AAC 50.030(b)(1)--public notification. This can be waived in writing by the Department for burns conducted in remote areas, where the news media is not generally available or where no public will be affected. Alternatives can be allowed such as a monthly or yearly announcement of burns if the requirements of 18 AAC 50.030(b)(1) cannot be met.

INDUSTRIAL

Open burning of oil or gas well flow tests must conform to 18 AAC 50.030(b)(2). It is the intent of the Department to eliminate open burning of liquid hydrocarbons because alternative measures are generally available. If alternatives become indisposed through equipment breakdown or inclement weather, this does not constitute the non-availability of alternatives.

~~LAND CLEARING~~ RESOURCE MGMT.

Prescribed burning, intentionally set fires to burn off ground and forest cover is usually, but not always, done by land management agencies. Each applicant will have an operational plan of action documenting the weather conditions under which the use of prescribed fire will be authorized, and contingency actions to follow if prescriptive conditions are exceeded. Plans for burning that may impact sensitive areas such as population centers or airports will require more specific detail than plans for remote areas. A complete burn plan is required for each prescribed fire.

Since prescribed burning is the burning off of ground cover, the normal requirements of "maximum combustion efficiency" does not completely apply. Applicants should discuss in detail how they are to conduct the burn. Lack of achieving "maximum combustion efficiency" will not, in itself constitute a reason to deny an application.

~~RESOURCE MANAGEMENT~~ LAND CLEARING

Open burning of slash material by farmers and developers is subject to obtaining written approval if the intent is to clear 40 acres or more over the life of the project. A complete burn plan is required for the burns planned for each year.

Open burning should be done as rapidly as safety and other considerations permit to develop maximum heat energy per unit time and and vent the smoke to the highest elevation possible.

Burning of dried material is favored because:

- higher heat energy with a related tall convection columns can be developed;
- cured material produces less smoke per unit volume than green material; and
- the medium size and larger fuels can be more effectively burned when cured and thus more satisfactorily remove the fire hazard.

Approval Issuance

The following conditions as modified to fit the specific open burning situation may be included in the
letter of approval:

- The applicant may be required to obtain meteorological information for the burn day, specifically wind speed, wind direction and ceiling level, both for the start of the burn and forecasted for the duration of the burn. If the wind directin would allow smoke to impact on sensitive areas, burning may be denied for that period.
- If the department determines that the airshed is being overloaded with smoke, a termination of the existing and proposed burning may be required. Limitations may have to be placed on the burn for easy shutdown..
- Notification at least one day in advance of burning attempts should be provided to the department's regional office. If burning is not conducted for that day, renotification is required on the day burning commences.
- A summary report listing tyes of fuels and quantities burned, days burning occurred, and the meteorological conditions during the burn should be sent to the department.
- The approval letter must be sent out within thirty days after receipt of a completed application.
- The approval letter must have a date of expiration.

Smoke

There is a need for the development of an Alaska Smoke Management Plan to control open burning. Due to the interagency concerns over such a document, the Smoke Management Working Group of the Alaska Interagency Fire Management Council should assist in developing the document for inclusion into this section.

Open Burning Prohibition

Open burning can be prohibited on an area-by-area basis if an air quality advisory is broadcast on a radio or television covering the area of concern. This advisory can be for a maximum of twenty-four hours but may be renewed daily. The advisory will be based on an assessment that inadequate air ventilation is available which would inhibit the dispersal of pollutants, such as inversions and low wind speeds.

## G. WOOD SMOKE POLLUTION CONTROL

### 1. Problem Description

Use of residential wood-fired heating devices has been demonstrated to cause air quality problems in locales where atmospheric ventilation is low, wood use per capita is high and the populations density is moderate to high. State and federal 24-hour standards for total suspended particulate matter (TSP) have been exceeded several times in portions of the Mendenhall Valley of Juneau.

Although TSP is the pollutant of primary concern, a potential for exceeding the eight-hour carbon monoxide standard does exist when particulate exposure is significantly above the health standard.

Wood use and hence wood smoke occurs in a large number of cities and communities throughout Alaska. However, climatic conditions are usually sufficient to disperse the pollution from the area. Although the Juneau area is presently the only known location to exhibit unhealthful air quality due to wood burning, this pollution problem will most likely increase in portions of the state where wood resources are plentiful.

Administrative procedures to maintain ambient air quality standards in locations where emissions from residential wood burning activities threaten public health are outlined in the following pages of this section.

### 2. Problem Assessment and Initial Control

The Department will install and operate air quality monitors in locations where wood smoke pollution is considered significant. If measured exposures approach or exceed the ambient standards, the relative impacts of all local activities will be assessed towards their respective contribution to the ambient exposure. If exposures are anticipated to reach or exceed the air quality alert value of 375 micrograms per cubic meter (ug/m$^3$) [see 18 AAC 50.610(a)(1)(B)], the Department will issue an air quality alert and enforce the requirements of 18 AAC 50.085(1). Additional air quality alerts will be issued when similar atmospheric and wood stove use conditions recur that may cause exposures above the ambient air quality standards.

Should exposures reach or exceed 150 ug/m$^3$ when wood smoke pollution is considered to be the major contributor, additional chemical analysis, approved chemical mass balance techniques and receptor models will be utilized to discern the actual impact of all local sources to the ambient exposure.

### 3. Local Government

Wood smoke pollution problems tend to be very characteristic of specific conditions such as frequency and severity of air stagnations, local terrain features, seasonal and daily wood use patterns, and type and quantity of wood and wood-burning appliances.

Because of these factors, adverse air quality conditions are best managed by the local government entities. The Department will assist communities in the development of appropriate and adequate air quality management plans. Volume III of this document contains the ordinance 83-63 of the City and Borough of Juneau.

4. Designation of Wood Smoke Control Areas

Specific locations based upon natural airshed boundaries may be designated as Wood Smoke Control Areas, allowing enforcement of stricter standards. Upon designation, the requirements of 18 AAC 50.085(3) are implemented. Boundaries for designated areas shall be defined as the natural, physical boundaries which establish the airshed or a portion of the airshed if sufficient technical information warrants designation of the smaller area. Additional control strategies to curb the existing and future emission quantities may also be needed. These additional strategies are best defined and implemented by local government. However, they can be developed and implemented by the Department.

Prior to designation as a Wood Smoke Control Area, two requirements must be met:

° Ambient exposures of TSP from residential wood-burning activities alone must have reached or exceeded 150 ug/$m^3$ on a minimum of two separate days using the analytical techniques outlined above in (2);

° The proposed designation requires a public notice and comment period.

5. Boundaries of Designated Wood Smoke Control Areas

Designated Wood Smoke Control areas include the Mendenhall Valley of Juneau, which is described as the area located between the terminus of the Mendenhall Glacier and the tidewaters of Gastineau Channel and Fritz Cove. This area is bounded on the east by the 500-foot elevation contour of Heintzleman Ridge, (Thunder Mountain and contiguous foothills), extending south from the Mendenhall Glacier to a point directly north of the eastern terminus of the runway for the Juneau International Airport. The western border of the area is defined as the northern border of Section (S) 6, Township (T) 40S, Range (R) 66E of the Copper River Medidian (CRM) beginning at its northeast corner and heading westerly to the northwest corner of S1, T 40S, R65E, CRM (approximately beginning at the 500-foot level of the Mendenhall West Glacier Trail and heading 2 miles directly west) and thence southerly along the western borders of Section 24 (a north-south line from the approximate southwest base of Mount McGinnis along the east side of Auke Lake to approximately 0.3 mile east southest of the southern shore of Auke Lake). At this point, the boundary is described be a westerly heading along the northern border of S26, T40S, R65E, CRM to a location directly north of the knoll named Pederson Hill. A direct southerly heading forms the described position through the top of Pederson Hill to the tidewaters of Fritz Cove serves as the final portion of the western boundary (boundary essentially divides the Mendenhall Peninsula along the north-south ridge line).

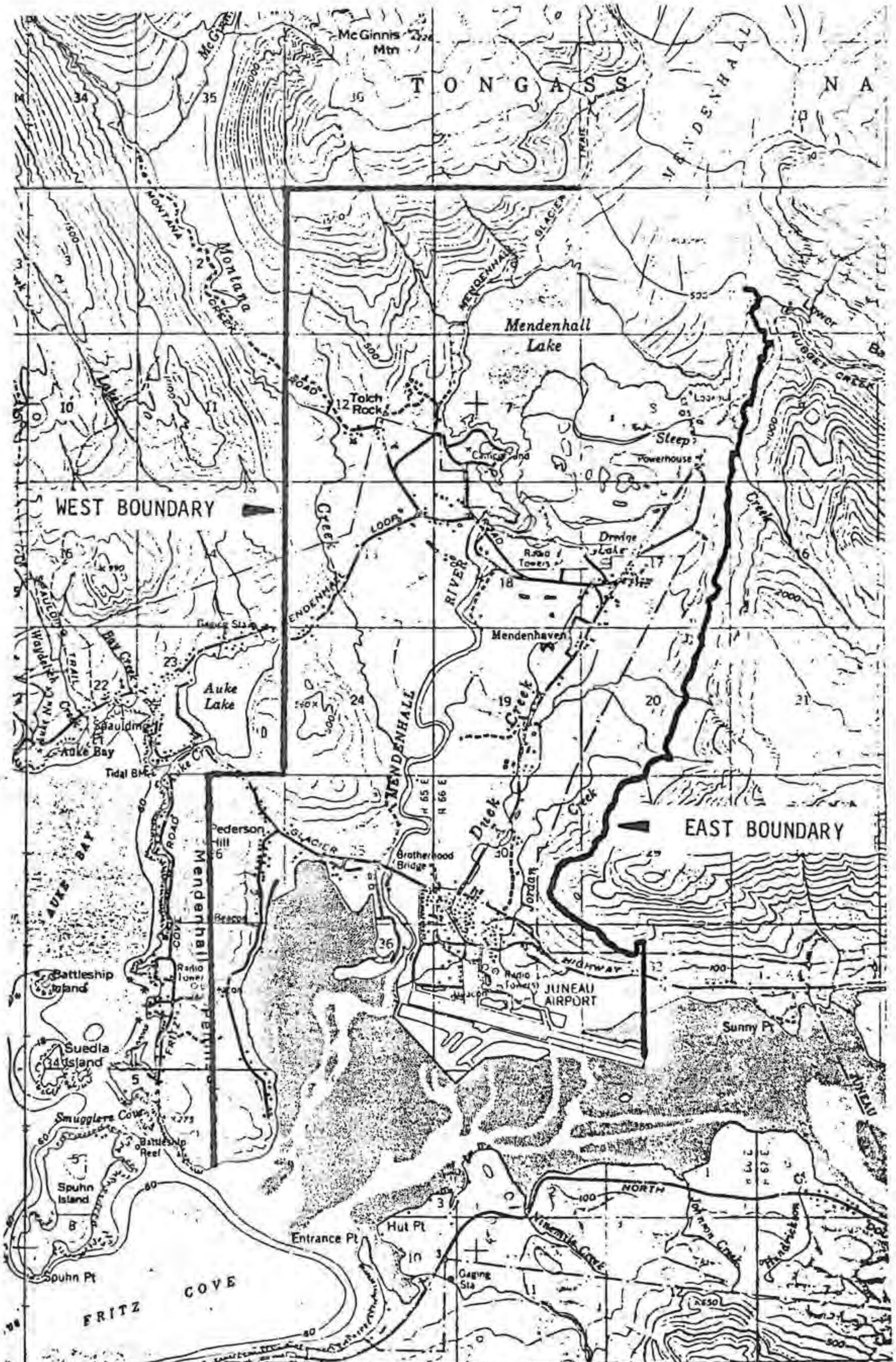


Figure III. G-1

MENDENHALL VALLEY WOOD SMOKE CONTROL AREA

## H. LEAD POLLUTION CONTROL

### 1. General

Existing exposures of lead in the ambient air are generated primarily through the use of lead contained in gasoline. Because of the carbon monoxide problem in Anchorage and Fairbanks from vehicular traffic, an air monitoring program was initiated in both cities to measure ambient concentrations of lead. Data collected for the period of March 1980 through March 1982, shown in Table III.H.1, indicate that exposures are below the specified ambient standard of 1.5 micrograms per cubic meter of air (quarterly arithmetic mean exposure). Other areas of the state are projected to exhibit even lower exposures since vehicular activity is less. At the present time, no industrial or mining activities occur which emit sufficient quantities of lead to adversely affect the air quality. Phasing out automobiles which utilize leaded fuel and diminishing the lead content of gasoline will continue to diminish lead exposures. Additional support documents regarding the assessment of this pollutant in the Alaska environment are presented in Section III.H of Volume III of this document.

### 2. Sources of Lead Emissions

Two small lead acid battery manufacturing plants located in Anchorage and Fairbanks produce approximately 50 and 20 batteries per day respectively. These facilities emit approximately 280 and 112 lbs. of lead per year at each respective location. Other than these minor sources, all emissions of lead are emitted either directly to the air from vehicle tailpipes or indirectly as re-entrained road dust. Projected vehicle emissions at each of the cities are presented in Table III.H.-1.

### 3. Control of New Emission Sources

Several criteria are established in Article 3 of the State Air Quality Control Regulations to prevent new facilities or other industrial activities from creating an ambient air quality problem for lead. Although each of these criteria are established for specific types of activities, the combined effect is to ensure that all proposed facilities that may emit large quantities of lead are reviewed by department personnel prior to issuance of a permit to operate.

Table III.H-1

ALASKA AMBIENT LEAD DATA
-Quarterly Arithmetic Mean Values
April 1980-March 1982

| | | Fairbanks Nordale School SAROAD ID# 020160017G01 | | Fairbanks Borough Bld #2 SAROAD ID# 020160016G01 | | Fairbanks State Office Building† SAROAD ID# 020160010F01 | | Anchorage 8th & L Street SAROAD ID# 020040020I01 | | Anchorage City Fire Station SAROAD ID# 020040005I01 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Calendar Quarter | Sample Days | Ave [Pb] ug/m$^3$ | Sample Days | Ave [Pb] ug/m$^3$ | Sample Days | Ave [Pb] ug/m$^3$ | Sample Days | Ave [Pb] ug/m$^3$ | Sample Days | Ave [Pb] ug/m$^3$ |
| 1980 | 2 | 15 | 0.18 | 12 | 0.18 | | | 15 | 0.33 | 15 | 0.60 |
| | 3 | 11 | 0.15 | 13 | 0.31 | | | 16 | 0.32 | 16 | 0.57 |
| | 4 | 7 | * | 7 | * | | | 14 | 1.08 | 15 | 1.25 |
| 1981 | 1 | 13 | 0.90 | 14 | 1.07 | | | 14 | 0.44 | 15 | 0.67 |
| | 2 | 11 | * | 13 | 0.30 | | | 15 | 0.29 | 15 | 0.49 |
| | 3 | 9 | * | 13 | 0.29 | 13 | 0.27 | 15 | 0.27 | 13 | 0.47 |
| | 4 | 15 | 1.02 | 13 | 0.87 | 10 | 1.17 | 13 | 0.56 | 13 | 0.73 |
| 1982 | 1 | 10 | * | 14 | 1.08 | 10 | 0.88 | 13 | 0.47 | 14 | 0.78 |

† Lead analysis of TSP samples at this site began June of 1981.

* Insufficient data from which to calculate an arithmetic mean value (i.e. minimum 10 sample days with at least 2 samples in each month.

Table III.H-2

PROJECTED LEAD EMISSIONS

1977 - 1987

TONS PER YEAR

| YEAR | ANCHORAGE | | | FAIRBANKS | | |
|---|---|---|---|---|---|---|
| | VEHICULAR | | POINT SOURCE | VEHICULAR | | POINT SOURCE |
| | tailpipe | road dust | | tailpipe | road dust | |
| 1977 | 17.13 | 22.96 | <1 | 3.63 | 3.50 | <1 |
| 1978 | 15.67 | 24.11 | <1 | 3.28 | 3.67 | <1 |
| 1979 | 13.93 | 25.36 | <1 | 3.38 | 3.86 | <1 |
| 1980 | 8.97 | 8.86 | <1 | 2.18 | 1.35 | <1 |
| 1981 | 5.78 | 9.40 | <1 | 1.40 | 1.42 | <1 |
| 1982 | 4.99 | 9.87 | <1 | 1.21 | 1.49 | <1 |
| 1983 | 4.53 | 4.35 | <1 | 1.10 | 0.66 | <1 |
| 1984 | 4.06 | 3.81 | <1 | 0.99 | 0.57 | <1 |
| 1985 | 4.07 | 3.43 | <1 | 0.99 | 0.52 | <1 |
| 1986 | 4.47 | 3.60 | <1 | 1.08 | 0.54 | <1 |
| 1987 | 4.88 | 3.78 | <1 | 1.18 | 0.57 | <1 |

SECTION IV

POINT SOURCE CONTROL PROGRAM

REVISED 10/30/83

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ALASKA AIR QUALITY CONTROL PLAN

# SECTION IV

## POINT SOURCE CONTROL PROGRAM

### A. SUMMARY

The objective of the Air Quality Control Program is to ensure ambient air quality does not adversely affect the health or general welfare of the public. One way is to limit the rate or quantity of pollutants discharged to the air at industrial, governmental and commercial sources. This section describes the permit and compliance program developed to assure major sources of air pollutants maintain compliance with regulations.

Section IV.B is a discussion of the State Air Quality Control Regulations as revised concurrently with this Plan.

Section IV.C discusses the role of the local air programs in Anchorage and Fairbanks in assuring air quality compliance of Alaskan facilities.

Section IV.D includes a general description of the types of sources in Alaska and which pollutants are emitted from them. Technologies applicable to control these pollutants are also described. A summary of the state's emission inventory for the major facilities in the state which emit air pollution is included, along with a detailed description of the status of facilities which have requested variances from the State regulations.

Section IV.E describes the point source control program in general.

Section IV.F is a discussion of permit application procedures.

Section IV.G describes the application review and permit development. The procedural aspects, permit requirements and monitoring/testing requirements are presented in detail. A major subpart is a description of the review procedures of the Prevention of Significant Deterioration section of the permit program.

Section IV.H presents the permit issuance procedures.

1. Annual Review Report

The Alaska Department of Environmental Conservation will publish an annual review of the state air permit program. The review will include the following:

- A listing of the PSD activity during the previous year including the number and description of PSD permits granted and under review;
- The level of PSD increment consumption in each area of the state;
- Visibility status of each Class I area and other areas identified in 18 AAC 50.021(c); and
- A nonattainment status report for each area in nonattainment with the limits listed in 18 AAC 50.020.

## B. STATE AIR QUALITY CONTROL REGULATIONS

The Alaska Air Quality Control Regulations 18 AAC 50 underwent major revisions during 1979 to incorporate new source emission standards, and more comprehensive and streamlined permitting requirements. These revisions also included the mandatory federal requirements relating to several New Source Performance Standards and Prevention of Significant Deterioration, so that Alaskan stationary sources could comply with applicable air quality requirements through the State Permit to Operate system.

The air quality regulations were revised in 1982 to include the changes made by the August 1980 amendments in the federal regulations, the incorporation of the visibility control program, and assumption of several NSPS regulations.

The 1983 revisions included the changes to the wood smoke control section of the regulations and the incorporation of the recent version of the State Implementation Plan into the regulations.

The most recent version of the regulations are contained in a yellow booklet available from any regional office of the department.

## C. LOCAL POINT SOURCE CONTROL PROGRAMS

The Department of Environmental Conservation currently has full responsibility for controlling stationary source emissions within local jurisdictions by carrying out the Permit to Operate system requirements in 18 AAC 50.300 and 18 AAC 50.400 and all other point source control activities. A local program may request delegation of the permit system if it has regulations at least as stringent as the applicable state regulations and has demonstrated the capability to adequately carry out all aspects of the program, including the requirements set out by Alaska Statutes section 46.03.210-230.

As of November, 1983, no delegation of point source control has occurred to any local programs in the state.

## D. DESCRIPTION OF SOURCE CATEGORIES AND POLLUTANTS

### 1. Typical Point Sources

Sources in the southeastern Alaska region are primarily related to timber processing. Several sawmills and two pulp mills are currently in operation. Particulate matter is generated by burning bark, sawdust and woodwaste in boilers or incinerators with oil used to help burn the material. Mechanical collectors remove soot and ash, but fine salts which permeate the logs during storage and transport in salt waters are not removed by these devices. At the pulp mills, the salt emissions from the chemical recovery boilers are also significant. High efficiency control units have been recently developed to control these emissions including sophisticated wet electrostatic precipators, mist eliminators, and scrubbers.

Sulfur dioxide results from combustion of high sulfur fuel oil with woodwaste in power boilers and from red liquor in the chemical recovery boilers. The chemical recovery system removes sulfur dioxide from the exhaust gas to make the acid needed for the pulping process. The particulate control systems also remove sulfur dioxide from the exhaust.

Sources in the southcentral and Cook Inlet Alaska regions are primarily related to oil and gas production, transportation, and processing. Electricity generation is another major industry. The primary emissions from both power generation and oil and gas industrial sources are oxides of nitrogen. Nitric oxide (NO), a nondesignated pollutant, constitutes over 90% of these emissions. However, it is often converted to the pollutant gas nitrogen dioxide ($NO_2$) by complex reactions in ambient air. This conversion depends on many factors, including available sunlight, and does not always occur. Recent developments in oxides of nitrogen control technology require changes in the fuel combustion process.

Where oil is used for fuel, sulfur dioxide is also emitted. Union Chemicals ammonia/urea plant emits ammonia in large quantities and has a prill tower which is the major industrial source of particulates in the Kenai area. At the Alyeska Pipeline terminus in Valdez a pollution source is the tanker traffic. Fuel oil containing an average of 1.5% sulfur powers the oil tankers and ballast discharge pumps and sulfur dioxide is generated.

Sources in the northern Alaska region are primarily related to oil production and transportation. At Healy and in Fairbanks, energy is produced at coal-fired utility plants. These coal-fired boilers, major sources of particulate matter, are controlled by multiclones. The emissions at Healy are controlled by a high efficiency fabric filtration unit.

Sources of air pollution on the North Slope are primarily large gas turbines used for gas and seawater injection into the ground to increase the amount of oil available, for pumping of oil and gas, for electricity generation, and for building heat. Well testing and other types of flaring also burn natural gas, gas liquids and oil carryover, creating black smoke that can travel for miles. Large quantities of nitrogen oxides are emitted from these sources. Most of these emissions consist of nitric oxide (NO).

In all regions, diesel engines are used for generating power for towns and cities. Oxides of nitrogen are major pollutants. Particulate matter, carbon monoxide and some sulfur dioxide are also emitted. Asphalt plants operate each summer at temporary and permanent locations in the state. Baghouses or high efficiency scrubbers remove most of the particulate matter.

2. Summary of Major Emitting Facilities

TABLE IV.D.2-1
MAJOR AIR POLLUTION-EMITTING FACILITIES IN ALASKA-
CALENDAR YEAR 1978

| PARTICULATES | TONS/YR |
|---|---|
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 3252 |
| Golden Valley Electric Association, Healy | 2200 |
| Louisiana Pacific, Ketchikan Pulp Co. | 1795 |
| Union Chemicals Division, (Collier Carbon) | 1246 |
| Fort Wainwright | 992 |
| Municipal Utilities System, Fairbanks | 352 |
| Clear Missile Early Warning Site | 225 |
| GVEA, North Pole Units | 103 |
| Chugach Electric Association, Beluga Station | 100 |

| SULFUR DIOXIDES | TONS/YR |
|---|---|
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 2989 |
| Louisiana Pacific, Ketchikan Pulp Co. | 1454 |
| Municipal Utilities System, Fairbanks | 629 |
| Golden Valley Electric Association, Healy | 613 |
| Eielson Air Force Base | 466 |
| GVEA, North Pole Units | 385 |
| Clear Missile Warning Site | 328 |
| University of Alaska Power Plant, Fairbanks | 239 |
| North Pole Refining | 109 |

| OXIDES OF NITROGEN | TONS/YR |
|---|---|
| Union Chemical Division, (Collier Carbon) | 7690 |
| Chugach Electric Association, Beluga Station | 2926 |
| ARCO, Central Compressor Plant, Prudhoe Bay | 2453 |
| Shemya Air Force Base | 2051 |
| Phillips Petroleum Company, LNG Plant | 1628 |
| Alaska Lumber & Pulp Co., Inc., Sitka Pulp Mill | 1608 |
| GVEA, North Pole Units | 1399 |
| Golden Valley Electric Association, Healy | 1329 |
| Louisiana Pacific, Ketchikan Pulp Company | 1214 |
| SOHIO Central Power Station | 1200 |
| Municipal Utilities System, Fairbanks | 1143 |
| Fort Wainwright | 952 |
| Eielson Air Force Base | 918 |
| Kodiak Electric Association | 763 |
| Elmendorf Air Force Base | 757 |
| Alyeska Pump Station 1 | 695 |
| Union Oil Co., Grayling Platform | 685 |
| Shemya Air Force Base | 653 |
| ARCO, King Salmon Platform | 641 |

| CARBON MONOXIDE | TONS/YR |
|---|---|
| Chugach Electric Association, Beluga Station | 815 |
| ARCO, Central Compressor Plant, Prudhoe Bay | 675 |
| Anchorage Light & Power, Ship Creek | 493 |
| Kodiak Electric Association | 464 |
| Shemya Air Force Base | 388 |
| SOHIO, Central Power Station, Prudhoe Bay | 334 |
| GVEA, North Pole Units | 317 |
| Adak Naval Station | 256 |
| Alyeska Pump Station 1 | 204 |

3. Facilities Under Permit

When the 1972 Alaska State Implementation Plan was written, it was estimated that 80 to 100 permits would be issued to owners of facilities capable of emitting 25 tons per year particulate matter or sulfur dioxide or 100 tons per year nitrogen oxides, carbon monoxide or hydrocarbons. During the ensuing six years, 349 applications for permits were processed. Of these, 37 were for petroleum product storage tank farms located in various towns and cities. Since the regulation setting a state ambient air quality standard for hydrocarbons was rescinded by the state in 1974, no permits were issued for this category.

Of the 312 sources which received permits, 42 were for the temporary facilities associated with construction of the Alyeska Pipeline, and 40-45 were issued to small facilities which installed a diesel-electric generator set larger than 250 kilowatt generating capacity. Neither of these source categories had been included in the original estimate.

The 1980 revisions to the regulations eliminated small facilities from requiring a permit. At this time, approximately 120 facilities are under permit.

TABLE IV.D.3-1
NUMBER OF PERMITTED FACILITIES, BY CATEGORIES AND REGION
IN THE STATE OF ALASKA - 1983

| CATEGORY | SOUTHCENTRAL | NORTHERN | SOUTHEASTERN | TOTAL |
|---|---|---|---|---|
| INDUSTRIAL | | | | |
| Asphalt | 17 | 8 | 6 | 37 |
| Oil Industry | 8 | 46 | - | 54 |
| Construction | 2 | 1 | 1 | 4 |
| Forest Products | - | - | 6 | 6 |
| Incineration | 2 | - | - | 3 |
| CITY FACILITIES | 3 | 1 | - | 3 |
| POWER/HEATING | | | | |
| Federal | 4 | 3 | - | 7 |
| Municipal | 3 | 4 | 1 | 7 |
| Institutional | - | 1 | - | 1 |
| Industrial | 4 | 1 | - | 1 |
| TOTAL: | 43 | 63 | 14 | 120 |

Six variances from the Alaska Air Quality Plan are in effect as of November, 1983.

TABLE IV.D.3-2
CURRENT VARIANCES

| | |
|---|---|
| Alaska Lumber & Pulp Co., Inc. | |
| Sitka Pulp Mill | Variance No. 5B |
| Wrangell Lumber Mill | Variance No. 3B |
| Herring Bay Lumber Company | Variance No. 12A |
| Ketchikan Pulp Company | Variance No. 4B |
| Mitkof Lumber Company, Inc. | Variance No. 2D |
| Union Chemicals Division | Variance No. 11B |

None of these variances from emission standards will result in violations of applicable ambient standards. All affected areas have been designated in attainment with particulate matter standards, and none of the variances will interfere with the maintenance of that designation.

Following are brief descriptions of the variances and a discussion of compliance activities:

Alaska Lumber & Pulp Co., Inc. -- Variance No. 5. There are six sources at the pulp mill near Sitka which emit air contaminants subject to the regulations. Three chemical recovery boilers burning red liquor and two power boilers burning oil and wood waste are major sources of both particulate matter and sulfur dioxide. One caustic liquor incinerator is a source of particulate matter.

Recovery Boiler No. 1 is equipped with a wet electrostatic precipitator (hydroprecipitrol) which has reduced particulate matter emissions from approximately 3500 pounds per day to less than 500 pounds per day.

Recovery Boiler No. 2 is equipped with a high efficiency wet scrubber to reduce particulate matter emissions from approximately 3500 pounds per day to less than 700 pounds per day.

Recovery Boiler No. 3 will be equipped with a similar wet scrubber by July 1, 1980, to reduce particulate matter emissions from approximately 5000 pounds per day to less than 1000 pound per day.

Packed towers are utilized on all recovery boilers to recover sulfur dioxide and produce the acid necessary for the pulping process. In 1973-1976, Recovery Boilers Nos. 1 and 2 were in compliance, each emitting approximatly 2300 pounds of $SO_2$ per day. In June of 1977 and 1978 the towers were repacked with more efficient material which probably reduced the emissions of $SO_2$ by 50% or more. To date no source tests have been run to confirm this. Recovery Boiler No. 3 was built in 1975 and emits approximately 275 pounds of $SO_2$ per day. The total emissions from the process are therefore about 10-20% of allowable emissions for $SO_2$.

Power Boiler Nos. 1 and 2 are equipped with high efficiency multiclones to remove soot, ash and sand from the exhausts. This type of control unit is less effective in removing the fine salts which are emitted. In mid-1978, the secondary wastewater treatment plant was started up. The wet sludge from this water pollution control system cannot be disposed of at a landfill, and ALP is attempting to burn it. The material significantly reduced the combustion efficiency of the boilers, increasing particulate matter emissions.

Fuel oil is burned in the boilers to supply the energy required to meet total steam demand. Some of the energy is needed to evaporate the water in the wood waste and the sludge. Sulfur in the oil is converted to sulfur dioxide and emitted at an average rate of about 5500 pounds per day from each boiler. These emissions vary depending upon the quality of fuel oil purchased and the amount burned each day.

The caustic liquor incinerator was installed in 1977 as part of the wastewater treatment program. Particulate matter emissions from this facility are controlled by a combination high efficiency scrubber and mist eliminator to about 40 pounds per day.

On January 22, 1979, Alaska Lumber & Pulp Co., Inc. of Sitka requested that the expiration date of Air Quality Control Regulation Variance No. 5 be extended from 1 July 1980 to 1 July 1984. Following public hearing in Sitka on May 2, 1979, the variance was extended to 30 April 1981 to allow completion of the recovery boiler emission project as previously scheduled, and additional time to evaluate techniques for minimizing the impact of secondary sludge on boiler operation and emissions.

Alaska Lumber & Pulp Co., Inc. -- Six-Mile Mill (formerly Alaska Wood Products) - Variance No. 3. There is one source at this sawmill near Wrangell which emits air contaminants subject to the Alaska Air Quality Control Regulations. The bark and wood waste boiler is a source primarily of particulate matter. The boiler has been repaired and the emission control system replaced. The new control unit has reduced particulate matter emissions from about 3000 pounds per 24-hour day to 1750 pounds per day. Current limited operating hours have reduced emissions to about 750 pounds per day. During winter months, the boiler has been operated at about 10% over design capacity resulting in twice the normal emissions.

One other source of particulate matter at the mill was a tepee burner, which is no longer in use. This source emitted particulate matter at about 5000 pounds per 24-hour day, and was shut down in 1976.

On February 22, 1979, Alaska Lumber & Pulp Co., Inc. requested renewal of Air Quality Control Regulation Variance No. 3. This variance was originally granted for operation of a tepee burner which ceased operation in 1976. The variance, granted on June 27, 1979, allows operation of a wood waste boiler at its maximum designed operating rate of 30,000 pounds steam per hour until the comprehensive program for power generation in Sitka and Wrangell by Alaska Lumber & Pulp Co., Inc. is completed.

The tepee burner emitted approximately 200 pounds particulate matter per hour. At maximum firing rates, the boiler emits about 75 pounds per hour compared with 65 pounds per hour when in compliance. The mill now operates only one shift per day due to limited wood supply and depressed market conditions. Thus daily emissions are about 750 pounds compared with maximum allowable emissions of about 1600 pounds per full operating day. Due to poor market conditions, the mill was shut down in November 1982.

Herring Bay Lumber Company - Variance No. 12. This small sawmill located near Ketchikan has a wood waste burner which emits about 15 tons particulate matter per year, and is not able to comply with visible emission requirements. The U.S. EPA issued a compliance order to the company in September 1975, which recently expired.

On March 23, 1979, Herring Bay Lumber Company requested a variance for operation of the tepee burner. The variance, granted on June 27, 1979, allows operation of the tepee burner until the company can determine the economic viability of the sawmill following settlement of pending legal actions and can implement an alternative method of wood waste disposal.

At normal operating rates, the burner emitted approximately 30 pounds particulate matter per hour. The mill is currently operating at about 10% of normal rate due to limited timber supply, significantly reducing annual emissions if not hourly emissions.

On July 30, 1983, a variance renewal was granted to allow time to search for appropriate landfill or other waste disposal schemes.

Ketchikan Pulp Company - Variance No. 4. There are six sources at the pulp mill in Ketchikan which emit sulfur dioxide and particulate matter. Two power boilers, each burning oil and woodwaste, exhaust through a common stack. Four chemical recovery boilers, each burning red liquor, now also exhaust through a common stack. Originally, each pair of boilers exhausted through separate recovery system stacks.

In June 1978 the recovery boiler particulate matter emissions control project was completed. The system reduced total particulate matter emissions from 7500 pounds per day to less than 200 pounds per day.

Sulfur dioxide emissions from the recovery systems each averaged about 2000 pounds per day, well within the allowable emissions. The new particulate matter control system probably reduced these emissions by an additional 50% or more, but data to confirm this is not available.

The power boilers are equipped with high efficiency multiclones to remove soot, ash and sand from the exhausts. However, this type of unit is not effective in removing very fine particulate matter such as salt. Higher steam and power demands, an increase in wood wastes to be burned, and the wet material from waste water control systems have affected boiler operations and increased emissions from these boilers. The emissions amount to about 9000 pounds per day. One of two additional particulate matter control units was installed during 1979. These units will remove much of the larger particles of ash, increasing the efficiency of the multiclones. Particulate matter emissions are expected to be less than 3500 pounds per day when this project is completed in early 1980.

Sulfur dioxide is produced by combustion of fuel oil in the power boilers. Average emissions of about 6000 pounds per day vary with the sulfur content of the oil and the quantity of oil burned.

The original variance was granted in 1975 to allow for design and installation of the recovery boiler emissions control system and improved control of the wood waste boilers. The recovery boiler control project is completed, but increased wood waste burning, the addition of primary clarifier wastes, overloading of the new multiclones and increased steam demand make compliance with particulate matter emission standards more difficult. On May 1, 1979, Ketchikan Pulp Company requested a ten month extension of the variance to install new soot-blower mechanisms and the second primary particulate control unit. An additional three years was also requested to study the impact of secondary wastewater treatment plant sludge on boiler operation and to take any necessary control measures needed. In 1979 a variance was granted to allow Ketchikan Pulp to complete these projects.

Current emissions of particulate matter at maximum production rates are approximately 520 pounds per hour. By April, 1980, emissions will be further reduced to about 160 pounds per hour. No estimate of the possible increase in emissions due to secondary sludge is available.

Mitkof Lumber Company, Inc. - Variance No. 2. The only source of concern at this Petersburg sawmill is the wood waste burner. Between 1972 and 1976, the original tepee burner was repaired and modified. However, the visible emissions from the burner were not sufficiently controlled. In 1976 a refractory brick silo burner was installed which maintains a much higher temperature and has improved combustion. Estimated particulate matter emissions were reduced from 6-10 tons per year to 3-5 tons per year. In 1979, Mitkof Lumber Company requested a variance extension to complete modifications improving combustion efficiency and to allow sufficient time to develop alternative methods for disposing of wood wastes. The rebuilt burner has a greater capacity for fuel, improved air supply and distribution and additional fuel oil burners. The variance, granted on June 27, 1979, allows visible emissions in excess of those specified in 18 AAC 50.050(a) during startup and burndown.

The burner emits about 5-20 pounds particulate matter per hour depending on the type and quantity of fuel burned and the combustion air flow. Visible emissons are within the standards about 80% of each operating day, exceeding the standards for 30 to 40 minutes at startup and burndown. However, particulate emissions may not increase during these periods. The change in visibility reduction may result from a lower air flow and condensing water vapor as the exhaust air cools down.

On July 29, 1983, Mitkof was granted a three year extension to explore their proposal to build a new mill.

Union Chemicals Division, Union Oil Company of California (previously known as Collier Carbon and Chemical Corp.) - Variance No. 11. The urea prill tower at the original Kenai plant is a source of particulate matter. The plume of very fine material exceeds visible emission standards. Changes in operating conditions reduced emissions by 20% in 1976, but did not achieve compliance with opacity requirements.

Union Chemicals Division, Union Oil Company of California requested and was granted on June 22, 1979, an extension of Air Quality Control Regulation Variance No. 11 from 30 October 1979 to 30 October 1982. The extension allowed the continuation of testing programs to develop a control system to reduce particulate matter emissions from the urea prill tower and comply with visible emission requirements. During this time, a scrubber was added to the prill tower inlet stream from the crystal drier. This action resulted in a reduction of the prill tower emission rate from 260 pounds per hour to 120 pounds per hour. However, the visible emissions from the tower still are above the regulation, in spite of a relaxation of the standard for the prill tower from 20% opacity to 30% opacity in 1982.

Consequently, Union Chemicals requested and was granted on November 18, 1982, a second extension of Variance No 11 to October 30, 1985. The variance places a limit of 55% opacity on the urea prill tower exhaust. The compliance schedule emphasizes changes in production and operations, instead of the addition of expensive control equipment, to achieve the opacity limits. Union Chemicals is exploring the various parameters such as melt temperature, prill rate, and ambient air temperature, and how they relate to the opacity levels from the prill tower.

The source is presently in compliance with the particulate matter emission concentration standards. Allowable emissions are about 200 pounds per hour, and current emissions are about 120 pounds per hour.

## E. POINT SOURCE CONTROL PROGRAM

### 1. Introduction

The department maintains control of air pollutant emissions of new or modified sources of pollution by review of proposals submitted for analysis. At that time, a determination will be made whether a permit must be issued as required by 18 AAC 50.300.

The State Air Quality Control Permit to Operate system, in existence since 1972, covers new and existing facilities by:

- Preconstruction design review and issuance of a Permit to Operate. This includes departmental assistance to applicants to ease their fulfilling application and data submittal requirements as quickly as possible, and to make certain the proposed undertaking can comply with air quality requirements before a permit is issued.

- Once a permit has been issued, source surveillance and periodic inspection is done by departmental field personnel, to assist source operators in maintaining compliance with air quality requirements. Specific operating conditions and requirements are identified as permit conditions, which are used as the basis for subsequent inspections.

- As inspections and surveillance indicate operating problems needing correction, permit conditions are modified to re-establish compliance as soon as reasonably possible. Depending on circumstances, compliance schedules may be attached as conditions to permits.

The State has by regulation set ambient air quality standards to protect the public health and welfare. Emission standards encourage proper operation and maintenance of equipment, require effective emissions control technology, and minimize ambient air quality effects of stationary sources, but allow industrial growth. The Permit to Operate system, established through 18 AAC 50.300 and 18 AAC 50.400, is one of the means to assure compliance with standards.

The 1980 and 1982 revisions to the Air Quality Control Regulations 18 AAC 50:

- incorporated Federal New Source Performance Standards (NSPS) and Prevention of Significant Deterioration Regulations (PSD) so the State can administer these mandatory programs, reducing the number of governmental entities to which the source owner is responsible;

- reduced the number of facilities requiring permits to large facilities whose impact is of concern, facilities which require emission control equipment to comply, and facilities subject to NSPS and PSD review.

- simplified the permit requirements to require only testing, monitoring, data gathering and reporting necessary for assurance of continued compliance with air quality standards and increments and emission standards;

- incorporated the changes made to the PSD program as a result of successful lawsuits against the regulatory interpretation of the PSD section of the Clean Air Act; and

- added the nonattainment area permit program, and added the visibility regulations protecting Class I areas and other designated areas from visibility degradation.

Section IV.F.1 includes a list of who needs a permit from the Department and what is to be contained in an application.

Section IV.F.2 describes the permit application procedures. Included are copies of the basic permit application, a detailed list of the information necessary to completely describe the facility, and a discussion of additional information which may be required such as ambient air monitoring. This does not include applicants subject to PSD review.

Section IV.F.3 describes the extensive information required from an applicant subject to review under Prevention of Significant Deterioration.

Section IV.F.4 describes the additional information needed from an applicant subject to the provisions of nonattainment pollutant control.

Section IV.G.1 describes the departmental procedures for reviewing a permit application.

Section IV.G.2 discusses the monitoring and testing required to be gathered for preparing a permit application.

Section IV.G.3 describes the Department's program to administer the Prevention of Significant Deterioration (PSD) requirements of the Clean Air Act through the State's Permit to Operate system.

Section IV.G.4 describes the Department's program to issue the permits for those facilities wishing to locate in a nonattainment area listed in 18 AAC 50.021(a).

Section IV.G.5 describes the Department's New Source Performance Standards (NSPS) program. These standards are mandatory federal emission requirements for certain new or modified sources. Specific monitoring, testing, and record keeping requirements are also included in these regulations.

Section IV.G.6 describes the Department's visibility review for the areas designated as sensitive to visibility impairment.

Section IV.G.7 discusses the procedures for handling sources still under EPA regulation.

Section IV.H describes the permit issuance procedures. A standard permit is presented. Also included are categories of information from which reporting requirements appropriate to each specific facility will be determined. An example of a permit attachment is given which describes the reporting requirements of a complex facility.

AMENDMENTS TO VOLUME II, SECTION IV

POINT SOURCE CONTROL PROGRAM

SUBPART F "FACILITY REVIEW PROCEDURES"

**Allowable and Actual Emissions**

Determination of the quantity of emissions from a new or existing facility or from a modification of an existing source or facility is a very important part of the decision whether or not a facility requires review under the Prevention of Significant Deterioration (PSD) provisions of the regulations. A number of terms have been used to describe emissions from a facility, but only the two terms "actual" and "allowable" have regulatory meaning. The distinction between actual emissions and allowable emissions is very critical.

This discussion presents each reference to actual or allowable emissions in the Alaska Air Quality Control Regulations 18 AAC 50. Then there is a discussion of a number of terms which have been used to describe the quantity of emissions from a source or facility, and a description of how that term may relate to the two regulatory terms. There are also examples of the use of the various terms.

Allowable emissions are most frequently used to describe the quantity of emissions from an existing facility or from a new source or facility, and are the quantity of emissions permitted. Actual emissions are those emitted during a particular period of time, and are most often used when "trading" emissions from existing sources at a facility to allow for the increase in emissions from a new source at the facility without going through the lengthy PSD review procedure.

The definition of actual emissions is found at 18 AAC 50.900(1) and reads as follows:

> "actual emissions" means the average rate, in tons per year, that the facility actually emitted during the most recent two years of normal operation; facility-specific allowable emissions may be considered actual emissions.

The definition of allowable emissions is found at 18 AAC 50.900(4) and reads as follows:

> "allowable emissions" means the calculated emission rate of a source or facility using the maximum rated capacity and enforceable limitations and conditions on emissions or operations.

The terms "actual" and "allowable" emissions are used in the regulations in several places. The facilities required to apply for a permit to operate are described in 18 AAC 50.300(a).

A new "major" facility is described in 18 AAC 50.300(a)(5)(A) and (6)(A) as:

(5)(A) - "a facility which has **allowable emissions** of 100 tons per year or more . . . installed after November 1, 1982;" or

(6)(A) - "a facility not listed in (5) of this subsection which has **allowable emissions** of 250 tons per year or more . . . installed after November 1, 1982."

A major modification of an existing "minor" facility is described in 18 AAC 50.300(a)(5)(B) and (6)(B) as:

(5)(B) - "a facility which is listed in (A) of this paragraph, with **allowable emissions** of less than 100 tons per year . . . and is modified after August 7, 1977, causing an increase in **allowable emissions** of 100 tons per year or more"; or

(6)(B) - " a facility which is not listed in (5) of this subsection which has **allowable emissions** of less than 250 tons per year . . . and is modified after August 7, 1977, causing an increase in **allowable emissions** of 250 tons per year or more."

A "significant" modification of an existing "major" facility is described in 18 AAC 50.300(a)(5)(C) and (6)(C) as:

(5)(C) - "a facility which is listed in (A) of this paragraph, with **allowable emissions** of greater than 100 tons per year . . . and which is modified after . . . causing an increase in **actual emissions** equal to or exceeding the emissions listed in (6)(C)(i) - (xvii) of this subsection"; or

(6)(C) - "a facility which is not listed in (5) of this subsection which has allowable emissions of more than 250 tons per year . . . and which is modified after . . . causing an increase in **actual emissions** equal to or exceeding any of the following: [quantities are listed in (i) - (xvii)]."

A new or modified existing facility located in a "nonattainment" area is described in 18 AAC 50.300(a)(7)(A) as:

"a source or facility installed, reconstructed, or modified after . . . located within an area identified in 18 AAC 50.021(a) . . . and causing an increase in **actual or allowable emissions** of the nonattainment air contaminant, whichever is greater, . . . of 100 tons per year or more."

A facility offering to reduce emissions to offset the increase in emissions due to the operation of a new or modified existing facility located in a "nonattainment" area is described in 18 AAC 50.300(a)(7)(B) as:

> "a source or facility for which the owner or operator has requested that the Department approve physical or operational limitations to provide **actual emission** reductions to offset the increase in emissions from a facility . . .."

The criteria for issuance of a permit are identified in 18 AAC 50.400.

The criteria for issuing a standard (non-PSD) permit in an area where the air quality is better than the ambient air quality standards are listed in 18 AAC 50.400(c), including :

> (c)(1) "**allowable emissions** from the facility and associated growth will not prevent or interfere with the attainment or maintenance of ambient air quality standards . . .."

The criteria for issuing a PSD permit are also listed in 18 AAC 50.400(c) , including:

> (c)(3)(B) "in an area designated . . . as in attainment . . ., **allowable emissions** from the facility and from associated growth will not . . ." exceed the increments or contribute to ambient air quality concentrations in a non-attainment area by more than a specified amount.

The criteria for issuing a permit to a major facility in an area where the ambient air quality standards are exceeded and issuing a permit to any facility providing offsets for the increase in emissions from the major facility are also listed in 18 AAC 50.400(c), including:

> (c)(4)(A) "the **allowable emission** increase...will not exceed the **actual emission** reduction specified in one or more permits issued . . ." to one or more facilities which have offered to reduce emissions to offset the increase from another facility.

The terms "allowable emissions" and "actual emissions" are the only terms used when discussing permit decisions. However, throughout the regulations, the term "emissions" is often used alone, without the adjectives "actual" or "allowable." In many references used in describing air quality issues, particularly in federal guidance and regulations, other adjectives are associated directly, or indirectly with the term emissions. This terminology may be descriptive and is useful in some circumstances, but great care must be taken when translating one of these to, or substituting one for, the two regulatory terms. These other terms include:

*Actual Emissions*
*Allowable Emissions*
*Associated Emissions*
*Controlled Emissions*
*Emissions from Associated Growth*
*Fugitive Emissions*
*Potential Emissions*
*Potential to Emit*
*Secondary Emissions*
*Uncontrolled Emissions*

In order to assist permit applicants and the permit writers in the Air Quality Control Program, this subsection contains a description of several of these "types" of emissions, and a discussion of the appropriate use of each when making decisions related to the issuance of a permit. Please note that in each discussion, comments and examples may be specific to one type of permit review and are not intended to be used in all circumstances.

## POTENTIAL EMISSIONS

**Potential emissions** are an estimate, frequently used prior to making a permit decision, of the total quantity of emissions from a source. This estimate is normally based on operation of the source at maximum rated capacity for 8760 hours per year with the maximum emission rate of an air contaminant anticipated, after an emission control device, if proposed. This estimate is used to determine which subparagraph of 18 AAC 50.300 applies to a proposed new source or facility, or a proposed modification of an existing source at the facility.

Potential emissions are not allowable emissions since they are merely an estimate of emissions and do not necessarily represent the amount of emissions permitted. Potential emissions are used as though they were allowable emissions to describe the "size" of a facility or modification in order to determine which permit application and review procedures are applicable. Potential emissions described in a permit application do not automatically become allowable emissions when the permit is issued. Potential emissions become allowable emissions only if they are established with enforceable measures in the permit when it is issued.

**Potential to emit** is terminology which may be synonymous with potential emissions, and is often useful because of the grammatical structure of the sentence. However, this term is more frequently used to describe the uncontrolled emission rate.

Potential emissions are usually based on emission factors published by EPA in AP-42, assuming the source runs at maximum capacity or rating for 24 hours per day and 365 days per year, usually is adjusted for the control efficiency of an emissions control device or system. In many older documents, especially those written prior to the Alabama Power Company v. Costle case, this term is used to describe the uncontrolled emission rate.

The emission factors listed in AP-42 often assume no control technology has been added to reduce emissions; however, updated tables may include emission factors based on a range of control unit efficiencies. The AP-42 data is based on a number of source tests of a variety of sources within any given category. Some tables include data that was acquired more than 5 to 10 years ago, and may not be appropriate for estimating emissions from new sources.

If a control unit or process is to be installed for the purpose of controlling emissions, the manufacturer's design or guaranteed efficiency would be used to adjust the uncontrolled emission rate. Alternatively, the manufacturer's design or guaranteed emission rate would be used to determine potential emissions.

Potential emissions are most frequently used to determine the "size" of a proposed new facility. The results of this calculation are used to determine whether or not the potential (i.e., new, estimated or projected) emissions from the proposed facility are subject to PSD review. That is, potential emissions are used to determine whether or not the potentially "allowable" emissions from the new facility may be greater than 100 tons if on the list of 26 facility types identified in 18 AAC 50.300(a)(5)(A), or the facility is one which has the potential to emit ("allowable emissions" of) an air contaminant at a rate which is greater than 250 tons per year.

A related circumstance requiring the calculation of potential emissions involves review of a proposed modification of an existing facility which has a permit establishing allowable emissions of one or more air contaminants below the applicable threshold of either 100 or 250 tons per year. It is necessary to determine whether the emissions of any other air contaminant from the facility, for which no allowable emissions of that air contaminant are established in the permit, exceeds 100 or 250 tons per year. Allowable emissions exist for those air contaminants specified in the permit, but the potential emissions of any other air contaminants would be used as though they were allowable for determining the size of the existing facility.

Another circumstance where potential emissions would be used is to determine whether or not a change at (modification of) an existing facility will result in an increase in emissions that would make the total emissions from the facility exceed 100 or 250 tons per year for any air contaminant. It would be necessary to use potential emissions from the existing facility to determine its original "size" since it is unlikely that, for a small facility, allowable emissions are specified in a permit; thus, the allowable emissions prior to modification have not been established.

A fourth circumstance requiring the determination of the potential emissions is to decide whether or not emissions will exceed one of the thresholds specified in 18 AAC 50.300(a)(6)(C)(i)-(xvi) from a new source installed at an existing facility for which allowable emissions greater than 100 or 250 tons per year have been established for one or more air contaminants. A variation of this would be to determine if some other type of modification of an existing facility will increase emissions by more than any threshold.

*Please note, potential emissions are NOT necessarily the allowable quantity of emissions from an existing facility. Potential emissions are only an estimate which is used to determine which subparagraph of 18 AAC 50.300 applies to a proposed new source or facility or a proposed modification of an existing source at the facility. Potential emissions are used as though they were allowable emissions for this purpose, but unless they are established as allowable emissions in a permit, remain merely an estimate of emissions which may be allowable. In those cases where the allowable emissions have not been established, potential emissions may be used to estimate the size of an existing facility for which a modification is proposed.*

*It should be recognized that, unless otherwise specified in the permit, the permittee may emit the maximum quantity of potential emissions estimated when the permittee submitted his original application and the department issued the permit. The department has essentially determined that the emissions of those regulated air contaminants not specified in the permit are "allowed," but by not listing them and setting enforceable limits, has not made the potential emissions "allowable" emissions. Any change or fluctuation in the quantity of the emissions of these air contaminants from year to year would not require control technology review as long as the facility or source is not modified or the type of raw material or fuel is not changed. However, any increase in actual emissions after a baseline date has been triggered may need to be reviewed to determine consumption of the available increment for the particular air contaminant.*

## ALLOWABLE EMISSIONS

**Allowable emissions** are one of the two measures of the quantity of emissions from an existing facility defined in the regulations, and are established as a result of the Department's permit decision.

Allowable emissions must be facility-specific and enforceable. This means that there must at least be an emission standard specified in the regulations; for example, the standard of 500 ppm $SO_2$ for an industrial process or fuel-burning source found in 18 AAC 50.050(c), and a requirement to comply with that standard set out in a condition of the permit for a facility.

a. the permittee has not ordered a different type (grade) of fuel, but the sulfur content of the oil gradually increases from 0.2 percent to 0.4 percent;

b. the permittee decides to install a new source at the facility which will emit sulfur dioxide; or

c. the permittee decides to increase operations from the six-months-per-year schedule to a twelve-month schedule.

In the first instance, the permittee has not modified the facility, and the actual increase in sulfur dioxide emissions is within the facility's allowable emissions which is limited only by the 500 ppm standard in 18 AAC 50.050(c). If the baseline date for the increment had been triggered by a major new facility or modification prior to the increase in sulfur content of the fuel, it would be appropriate to require an increment analysis because of the increased quantity of actual sulfur dioxide emissions. It may be necessary to restrict the sulfur content of the fuel in order to assure compliance with the increment specified in 18 AAC 50.020(b). This illustrates that the ambient air quality standards and increments may be the basis for setting allowable emissions for a facility.

In the second instance, the permittee has modified the facility, and the increase in actual emissions from the new source is not within the previously allowed quantity of emissions. In determining the allowable emissions of $SO_2$ for the facility, rather than using the 500 ppm limit specified in the regulations and the exhaust volume, the calculation would be based on the 0.2 percent sulfur content of the fuel, since that type of fuel was "assumed" to be allowed, and has resulted in an actual emission rate. Absent a limit on operating hours or rates, the design fuel burning rate and 24-hour, 365-day operations are appropriate, since these have always been allowable operating parameters. This, then, would be the basis for establishing the total allowable emissions of $SO_2$. The increase in sulfur dioxide emissions from the modification is an increase in "allowable" emissions and needs to be checked to determine the applicability of the subsections of 18 AAC 50.300(a) to the modification.

An enforceable limit on the sulfur dioxide emissions from the new source would be specified in the permit. Usually the permit would specify two or more limits for the sulfur dioxide resulting from fuel combustion. In this example, one limit on the fuel quality would be an annual average of 0.2 per cent sulfur. The second would be a maximum limit set for any individual shipment of perhaps 0.3 per cent. In some cases it may be appropriate to set different standards related to the short term averaging periods for the corresponding ambient air quality standard, for example 500 ppm for three hours, based on the regulatory standard and the averaging time for the shortest term ambient standard.

Once the quality of the fuel oil is limited, the potential emissions resulting from either a change in the type of fuel or an increase in sulfur content beyond the limit would be considered a modification for the purposes of PSD review.

In the third instance, the change in hours of operation from a six-month-per-year schedule to a twelve-month schedule would not be a modification. The increase in total quantity of sulfur dioxide emissions per year would be within the allowable emissions for the facility. However, if the increment baseline date had been triggered prior to this change in schedule, the permittee should be required to perform an analysis for compliance with the annual increments for $SO_2$, $NO_x$, and particulate matter due to the increase in the total quantity of these air contaminants.

When a permit is issued in which the emission concentration or rate and the annual quantity of emissions are specified, the estimated "potential" emissions may have been established as the quantity of allowable emissions. However, it is possible that the allowable emissions may be set at a quantity less than the potential emissions originally proposed by the applicant as a result of the permitting decisions involving control efficiency, operating rate, or operating time.

**ACTUAL EMISSIONS**

Actual emissions are defined as those emissions which occurred during the two most recent years of normal operations of a facility. Actual emission rates must be determined by the best information available; usually, this means source test data or records from a continuous monitoring system. The annual total actual emissions data must be based on the average operating rate and total hours of operation for the two-year period.

When reviewing a request for permit amendment which involves any type of modification, whether or not the modification is expected to result in an increase in emissions, the actual emissions should be determined. These should be compared with the allowable emissions, if established in the permit, to confirm compliance with the allowance before evaluating any net change in emissions resulting from a modification.

Actual emissions would be used for the purposes of making a permit decision when an applicant wishes to avoid going through PSD review for an increase in actual emissions associated with installation of a new source by proposing to reduce actual emissions from an existing source to limit the increase in emissions by reducing operation of that source or by installing more efficient controls. When establishing such a trade, the emission increase must be concurrent with the emission reduction. The trade must be based on the net result of the increase in allowable emissions and the decrease in actual emissions of the same air contaminant at the facility.

Typically, the quantity of allowable emissions will not be set out in a permit for a facility which has had a permit for many years and has never undergone PSD review or requested a PSD avoidance permit as provided for by 18 AAC 50.300(e). Although the allowable emissions have not been overtly established for this facility, there are specific, enforceable emission limits in the regulations which, when combined with the premise that the permit authorizes operation of each source for 8760 hours per year at maximum rated capacity, establish the quantity of allowable emissions for that air contaminant at that facility.

Preferably, facility-specific allowable emissions should be clearly established in the permit. This is done by referring to the specific applicable regulation(s) in a condition of the permit which requires compliance with that emission standard. If requested by, or agreed upon by the permit holder, there may also be a limit on the operating rate of a particular source, established in another condition of the permit. Similarly, there may be a limit on the quality or quantity of the fuel burned in a particular source, or the entire facility, if requested by, or agreed upon by the permit holder. Or the permit holder may have requested or agreed to an emission concentration less than that specified in the regulations.

An exhibit of the permit, usually Exhibit B, would contain a list for each source or group of similar sources identifying, by air contaminant, the emission standards (regulations) or limits (requested or agreed upon) which apply to that source or group. Any limit which is based upon limited test data should include an allowance for normal operating variations which may be expected, but should not exceed 50 percent of the actual test data. Each standard or limit should be expressed in terms which indicate the averaging period for determining compliance, whether it be a one hour or an annual average. Different limits for the same air contaminant are often set for different averaging periods, or in the case of fuel, for a single shipment. The annual quantity of allowable emissions, in tons per year, should also be established, based on the limit for the annual average emission rate.

The quantity of allowable emissions may be determined in several ways. The determination of allowable emissions when making a permitting decision must be done very carefully.

The quantity of allowable emissions, in tons per year, is usually used either to

a. define the size of a new facility to determine if the proposed facility is subject to PSD review, or

b. to determine the size of an existing facility in order to determine whether or not the allowable (potential) emissions from a proposed modification of an existing facility are subject to PSD review [see 18 AAC 50.300(a)(5)(A) and (B), and (a)(6)(A) and (B)].

One way to determine allowable emissions is to base the calculation on the applicable emission standards in the regulations. In the general case these would be 0.05 gr/scf in the case of particulate matter, and 500 ppm $SO_2$ in the case of sulfur dioxide. Of course there are other standards specified in 18 AAC 50.040, .050, and .060, which must be used in specific cases. Again, the maximum operating rate and 24-hour and 365-day operations would be assumed.

*Please note, if there is no emission standard in the regulations or in the permit, the potential emissions described in the permit application are NOT the allowable emissions for the facility, they are merely an estimate. In most cases emissions standards for $NO_x$, CO, or VOCs are not specified in the regulations. The exceptions to this are for specific sources found only at petroleum refineries, and are found in 18 AAC 50.050(d)(2). In issuing a permit the Department "allows" the emissions of these estimated quantities; however, they do not become "allowable emissions" since there are no enforceable standards set out in the permit.*

The second way to determine allowable emissions is to base the calculation on the applicable limits specified in the permit for the facility. Such limits are normally established when a facility or modification of a facility has undergone PSD review. In many such permits limits have been established for only one or two air contaminants of concern. Often these limits were applied only to the new or modified source, not to each existing source at the facility.

When a PSD permit is issued for operation of a new facility or a new source at an existing facility, or for any other modification of an existing facility, an emission standard is usually established following a BACT determination. This is usually the basis for also establishing a limit on the total tons of that air contaminant allowed.

*Please note, if the permit establishes a limit on the total annual tons of an air contaminant from a source or group of sources, that limit IS the allowable emissions for that air contaminant from that portion of the existing facility. In most circumstances no other calculation should be necessary.*

A third way to determine allowable emissions would be based on the original permit application (or subsequent amendments) and the operating history of the existing facility.

> As an example, consider a case where the original permit application for a fuel oil burning facility indicated that the typical fuel would have a sulfur content of 0.2 percent sulfur. The resulting permit did not specify the fuel quality, nor did it specify the number of operating hours per year. The facility actually has a history of burning 0.2 percent sulfur fuel, has no source test data, and has averaged operating at 80 percent capacity for six months per year. Three types of changes could occur at this facility which would require an evaluation to determine whether or not an increase in emissions is in addition to the allowable emissions.

Many AP-42 emission factors are for sources without controls. These uncontrolled emission factors must be corrected to account for the efficiency of a proposed control system when determining allowable emissions. If no control is proposed, but in the permit decision process the Department were to require a control unit, then the potential (uncontrolled) emissions would be used to determine the size of the facility, but the permit would specify as allowable emissions, the controlled emissions.

It would be appropriate to base allowable emissions on controlled emissions when renewing a permit for an existing, unmodified facility which has installed a control unit capable of reducing emissions well below the applicable regulatory standard. Since the lower rate of emissions is not specified in the regulations and the facility is not subject to PSD review, the permit writer would need to confer with the permittee and elicit his concurrence with the proposed limit. The total allowable emissions, expressed in tons per year, would be calculated based on the controlled emissions rate. The rate set should be somewhat greater than the actual or guaranteed rate, but normally it should not be more than 50 percent greater. In the permit it should clearly stipulate that this rate is to be met over an annual averaging period and the short-term limit should be set equal to the applicable regulatory standard.

> An example of this would be an existing coal-fired boiler which has installed a baghouse or electrostatic precipitator to control particulate emissions. The source tests show emissions are actually 0.035 grains/dry standard cubic foot of exhaust. The applicable regulatory requirements are 0.1 gr/dscf, and 20 percent opacity. When renewing the permit, it would be reasonable to set the emission limits in the permit at 0.05 gr/dscf on an annual basis and 0.1 gr/dscf on a 24-hour basis. The 0.05 is about 40 percent greater than the source test and equal to the "general" regulatory requirement for new fuel burning sources. The annual total allowable emissions would be based on 0.05 gr/dscf. Compliance with this limit could only be determined by a continuous monitor or by a large number of source tests. However, if the results of any one test were greater than 0.05 gr/dscf, it would be cause to investigate whether the control unit were failing. Compliance with the 0.15 gr/dscf regulatory standard for one set of tests would always be the maximum emission rate allowed.
>
> It would also be appropriate to set two opacity limits, 20 percent opacity not to be exceeded for more than three minutes in any hour, and a 24-hour average of 10 percent transmissivity as measured by a continuous monitor averaging every XXX seconds.

The "allowable" emissions, expressed in tons per year, would be calculated based on the 0.05 gr/dscf at 100 percent fuel burning capacity and 8760 hours per year.

## FUGITIVE EMISSIONS

The definition of fugitive emissions found in 18 AAC 50.900 is "those emissions of a regulated air contaminant which cannot reasonably pass through a stack, chimney, vent, or other functionally equivalent opening." Fugitive emissions most often encountered include those emissions of particulate matter or VOCs which are released from conveyors, pumps, stock piles, transfer points, open storage vessels, roadways and other similar points.

Fugitive emissions are counted toward potential emissions for determining applicability of PSD review only of facilities listed on pages IV.F.1-5 through 1-8 of the Air Quality Control Plan. Emissions released from a flare would be counted in the same way the quantity of emissions from a stack or other typical exhaust point would be counted when determining potential emissions from a facility, and are not considered to be fugitive emissions.

When issuing a permit for a facility where there are fugitive emissions, it may be appropriate to impose conditions specific to the fugitive emissions, to enhance ambient air quality or deal with the nuisance factor. These emissions may be listed in the source inventory and assigned an "allowable" annual emission quantity; however, this might be difficult to enforce since measuring techniques may not be available.

## ASSOCIATED EMISSIONS

Emissions not released from a facility, but which must be considered during review of a PSD permit application are known by several terms. **Associated emissions**, or **secondary emissions**, are those which are caused by operation of a facility, but which are not from the stationary sources which comprise the facility. Consideration of these emissions is most important when assessing the ambient impact of a facility in or near a non-attainment area or a Class I (PSD) area. Emissions from the vehicles which are used by the employees of the facility, or those which are used to transport raw material to the facility, haul material around at the facility, and to transport product from the facility, are **associated emissions**. It may be necessary to include requirements to control associated emissions in the permit. If a major new facility were constructed in a small town and a new school with a heating plant were required, emissions from that new stationary source would be called **emissions from associated growth**. The impact of these emissions must be reviewed as part of the increment analysis.

*Please note, this example and the discussion which follows concern only a facility proposing a trade and requesting that the permit be designed to preclude PSD review, by limiting emissions from specific sources or by limiting or prohibiting operation of some sources as provided for in 18 AAC 50.300(a)(8) and 18 AAC 50.400(d)(4).*

If there is no emission standard in the regulations and no emission limit is specified in the permit, the actual emission rate should be used in conjunction with the operating rate and total number of hours in a year. The actual emissions may be adjusted to represent year-round operation rather than the actual operating hours, but not in the case of a source clearly identified as an emergency or standby unit even if there is no hourly restriction in the permit. This would yield the value of "allowable" emissions for the air contaminant which had not been previously assigned in a permit.

If there is a standard in the regulations or permit, you would determine the actual emissions and adjust them in the same manner. Allowable emissions which are specified in the permit would be used for a trade only if actual (adjusted) emissions were approximately the same as the quantity in the permit.

For example, there may be an engine which drives a firewater pump and which is tested for about 2 hours once a month to be sure it is available for use in an emergency. The actual emissions from this source would be those that result from 24 hours of use per year. When establishing allowable emissions for this source it would be appropriate to assume 10 hours operation per month to allow for more extended operation after an overhaul of the engine or similar non-routine, but not unusual events. It would be inappropriate to set allowable emissions as though the source were operated for 8760 hour a year and then "trade" this quantity for the increase in emissions from a new source which is intended for year round operation.

In the preceding example, the new emissions are an increase in "allowable" emissions, but the credit must be given for a reduction in "actual" emissions. If the original permit indicated that the source providing the decrease in emissions had allowable emissions, the allowance must be removed from the permit. Actual emissions, adjusted to maximum allowable hours of operation, rather than the maximum allowable emissions are used for the trade, even though the allowable emissions are specified in the permit, to conform with the intent of 18 AA 50.300(a)(5)(C) or (a)(6)(C).

For example, suppose that, at a facility which has allowable emissions of 325 tons NOx per year, one of the sources were permitted for full operation at maximum load, and the allowable emissions of NOx for this source were 150 tons per year. The owner proposes to install a new source with potential emissions of 90 tons $NO_x$ per year. He also proposes to shut down the existing source. The owner has a history of running the existing source at 67 percent load and 8000 hours per year. The actual emissions available for the trade would be 100 tons per year, based on 67 percent load and 8760 hours per year. The emissions "trade" itself would be a reduction of 10 tons per year. However, the reduction in allowable $NO_x$ emissions for the facility would be 60 tons per year! The permit must be adjusted to show the new total allowable emissions.

*Please note, the quantity of emissions available for the trade is the actual emissions, with perhaps a minor adjustment to account for full-time operation if the source's actual operations were essentially continuous and near full load. The entire amount of allowable emissions associated with the "retired" source must be removed from the facility's allowable emissions. The new size of the facility then would be the allowable emissions from all existing sources other than the shut-down source plus the ninety tons of new allowable emissions from the new source, a net decrease of 60 tons per year. The actual reduction of 10 tons per year due to the trade was first used to determine whether or not PSD review is required. This 10-ton reduction is also available in the "account" to determine whether a subsequent modification would be subject to PSD review; for the contaminant $NO_x$, PSD review would be required when a modification would result in a total increase in emissions of more than 50 tons per year.*

## CONTROLLED EMISSIONS

Controlled emissions are essentially the same as actual emissions, in that they are the rate of emissions from a source including a control unit to reduce the potential emissions. The concept differs in that controlled emissions represent the actual rate of emissions anticipated for a year rather than the quantity of emissions during a year. The quantity of actual emissions, adjusted for maximum load and maximum hours would yield the quantity of controlled emissions.

It may be useful to establish, in a permit, annual allowable emissions based on controlled emissions, particularly if the control unit is so efficient that the resulting rate of emissions is far less than the applicable regulatory standard. If this were done, it is important to provide an allowance for "normal" wear. This may result in two emission limits, one the annual average rate and the second, a short term limit equal to the applicable regulatory standard.

The annual quantity of allowable emissions would be determined based on the emission rate actually anticipated, at the maximum design capacity. The short term allowable emission rate would usually be based on the regulatory standard. This means that if an applicant proposes to install a control unit to reduce the potential emission rate, the annual quantity of allowable emissions would be based the total quantity of controlled emissions.

## EMISSIONS, ALLOWABLE and ACTUAL

*Potential to Emit*
*Potential Emissions*
*Allowable Emissions*
*Actual Emissions*
*Controlled Emissions*
*Uncontrolled Emissions*
*Fugitive Emissions*
*Associated Emissions*

### POTENTIAL EMISSIONS

Potential emissions are estimated emissions from a source. They are usually based on emission factors published by EPA in AP-42, assuming the source runs at maximum capacity or rating for 24 hours per day and 365 days per year. If the information is available, a more appropriate emission rate to use would be based on manufacturer's data, usually a guaranteed emission rate.

In most cases, AP-42 assumes no control technology has been added to reduce emissions. The AP-42 data is based on a number of source tests of a variety of sources within any given category; in some cases the data was acquired more than 5 to 10 years ago.

If a control unit or process is to be installed for the purpose of controlling emissions, the manufacturer's design or guaranteed efficiency would be used to adjust the uncontrolled emission rate. Alternatively, the manufacturer's design or guaranteed emission rate would be used to determine potential emissions.

Potential emissions are used to determine the "size" of a proposed new facility. You would use the results of this calculation to determine whether or not the proposed facility is subject to PSD review. That is, to determine whether or not emissions from the new facility are greater than 100 tons if on the list of 26 facility types identified in 18 AAC 50.300(a)(5)(A), or is a facility which has the potential to emit more than 250 tons per year of an air contaminant.

Another circumstance where you would use potential emissions is to determine whether or not a change at (modification of) an existing facility will result in an increase in emissions that would make the total emissions from the facility exceed 100 or 250 tons per year.

The third circumstance requiring you to determine the potential emissions is to determine whether or not emissions from a new source installed at an existing facility already larger than 100 or 250 tons per year will exceed one of the thresholds specified in 18 AAC 50.300(a)(6)(C)(i)-(xvi). A variation of this would be to determine if some other type of modification of an existing facility will increase emissions by more than any threshold.

See 1990, revision

*Please note, potential emissions are NOT to be used to define the quantity of emissions from an existing facility.*

**ALLOWABLE EMISSIONS**

Allowable emissions are one of the two measures of emissions from an existing facility. The quantity of emissions may be determined in several ways. Use of allowable emissions when making a permitting decision must be done very carefully.

The quantity of allowable emissions, in tons per year, is usually used to define the size of the existing facility in order to determine whether or not the potential emissions from a proposed modification of an existing facility are subject to PSD review.

One way to determine allowable emissions is to base your calculation on the applicable emission standards in the regulations. In the general case these would be 0.05 gr/scf in the case of particulate matter, and 500 ppm $SO_2$ in the case of sulfur dioxide. Of course there are other standards specified in 18 AAC 50.040, .050, and .060, which must be used in specific cases. Again, the maximum operating rate and 24-hour and 365-day operations would be assumed.

*Please note, if there is no emission standard, the potential emissions described in the permit application are NOT the allowable emissions; in most cases emissions standards for $NO_x$, CO, or VOCs are not specified. The exceptions to this are for specific sources found only at petroleum refineries, and are found in 18 AAC 50.050(d)(2).*

The second way to determine allowable emissions is to base your calculation on the applicable limits specified in the permit for the facility. Such limits are normally established when a facility or modification of a facility has undergone PSD review. In many such permits you will find limits established for only one or two air contaminants of concern. You will probably find that the limits were applied only to the new or modified source, not each existing source at the facility.

When a PSD permit is issued for operation of a new facility or a new source at an existing facility, or for any other modification of an existing facility, an emission standard is usually established following a BACT determination. This is usually the basis for also establishing a limit on the total tons of that air contaminant allowed.

*Please note, if the permit establishes a limit on the total annual tons of an air contaminant from a source or group of sources, that limit IS the "allowable emissions" for that air contaminant from that portion of the existing facility. In most circumstances no other calculation should be necessary.*

A third way to determine allowable emissions would be based on the operating history of the existing facility.

As an example, consider a case where the original permit application for a fuel oil burning facility indicated that the typical fuel would have a sulfur content of 0.2 percent sulfur. The resulting permit did not specify the fuel quality, nor did it specify the number of operating hours per year. The facility actually has a history of burning 0.2 percent sulfur fuel, has no source test data, and has averaged operating at 80 percent capacity for six months per year. In determining allowable emissions of $SO_2$ for this facility, rather than using the 500 ppm limit specified in the regulations and the exhaust volume, you would base your calculation on the 0.2 percent sulfur content of the fuel, since that type of fuel was "assumed" to be allowed, and has resulted in an actual emission rate. Absent a limit on operating hours or rates, you would use the design fuel burning rate and 24-hour, 365-day operations, since these have always been allowable operating parameters. This then is the basis for establishing allowable emissions of $SO_2$.

Thus, the potential emissions resulting from a change in the type of fuel (an increase in sulfur content) would be considered a modification for the purposes of PSD review. An increase in emissions resulting only from a change in hours of operation from a six-month-per-year schedule to a twelve-month schedule would not be a modification.

When a permit is issued in which the emission concentration or rate is established and the annual quantity of emissions is specified, the potential emissions become the allowable emissions. The allowable emissions may be less than the potential emissions originally proposed as a result of the permitting decisions involving control efficiency, operating rate, or operating time.

**ACTUAL EMISSIONS**

AP-42

Actual emissions are defined as those emissions which occurred during the two most recent years of normal operations of a facility. Actual emission rates must be determined by the best information available, usually this means source test data or records from a continuous monitoring system. The annual total actual emissions data must be based on the average operating rate and total hours of operation for the two-year period.

When reviewing a request for permit renewal, particularly if it involves any type of modification, whether or not the modification is expected to result in an increase in emissions, the actual emissions should be determined. These should be compared with the allowable emissions, if identified in the permit, to confirm compliance with the allowance before evaluating the net change in emissions resulting from the modification.

You would use actual emissions when an applicant proposes to trade an emission reduction by reducing operation of an existing source or by installing more efficient controls in order to provide for installation of a new source without going through PSD review for its increased emissions. When establishing such a trade, the emission increase must be concurrent with the emission reduction.

If there is no emission standard in the regulations and no emission limit is specified in the permit, the actual emission rate should be used in conjunction with the operating rate and total number of hours in a year. This would yield the value of "allowable" emissions for the air contaminant which had not been previously assigned in a permit. The actual emissions may be adjusted to represent year-round operation rather than the actual operating hours, but not in the case of a source clearly identified as an emergency or standby even if there is no hourly restriction in the permit.

The reasoning here is that the new emissions are an increase in "allowable" emissions, but the credit must be given for a reduction in "actual" emissions. If the original permit indicated that the source providing the decrease in emissions had allowable emissions, the allowance must be removed from the permit.

> For example, one source at a facility is permitted for full operation at maximum load, and the allowable emissions of NOx for this source are 150 tons per year. The owner proposes to install a new source with potential emissions of 90 tons $NO_x$ per year. He also proposes to shut down the existing source. The owner has a history of running the existing source at 67 percent load and 8000 hours per year. The actual emissions available for the trade would be 100 tons per year, based on 67 percent load and 8760 hours per year. The emissions "trade" itself would be a reduction of 10 tons per year. However, the reduction in allowable $NO_x$ emissions for the facility would be 60 tons per year! The permit must be adjusted to show the new total allowable emissions.

*Please note, the quantity of emissions available for the trade is the actual emissions, with perhaps a minor adjustment to account for full-time operation. The entire amount of allowable emissions associated with the source must be removed from the facility's allowable emissions. The new size of the facility then is the allowable emissions from all existing sources other than the shut-down source plus the ninety tons from the new source, a net decrease of 60 tons per year. The reduction of 10 tons per year due to the trade was used only to determine whether or not PSD review is required. This 10-ton reduction is also available in the "account" to determine when the next modification is subject to PSD review; if the contaminant were $NO_x$, PSD review is required when the next modification increases emissions by 50 tons per year.*

**CONTROLLED EMISSIONS**

Allowable emissions are determined based on the emission rate actually anticipated. This means that if a control unit is to be installed to reduce the potential emission rate, the allowable emissions would be the total quantity of controlled emissions. Most AP-42 emission factors are for sources without controls. These uncontrolled emission factors must be corrected to account for the efficiency of a proposed control system when determining allowable emissions. If no control is proposed, but in the permit decision process you require a control unit, then the potential (uncontrolled) emissions would be used to determine the size of the facility, but you would specify as allowable emissions, the controlled emissions.

## FUGITIVE EMISSIONS

Fugitive emissions are generally those emissions of particulate matter or VOCs which are released from conveyors, pumps, stock piles, transfer points, open storage vessels, roadways and other similar points.

Fugitive emissions are counted toward potential emissions for determining applicability of PSD review only of facilities listed on pages IV.F.1-5 through 1-8 of the Air Quality Control Plan. Emissions released from a vent or flare would be included with the emissions from a stack or other typical point when determining potential emissions, and are not considered to be fugitive emissions.

When issuing a permit for a facility where there are fugitive emissions, you may impose conditions specific to the fugitive emissions, to protect ambient air quality or the nuisance factor. These emissions may be listed in the source inventory and assigned an "allowable" annual emission quantity; however, this might be difficult to enforce since measuring techniques may not be available.

## ASSOCIATED EMISSIONS

Associated emissions are those which are caused by operation of a facility, but which are not from the stationary sources which comprise the facility. Consideration of these emissions is most important when assessing the ambient impact of a facility in or near a non-attainment area or a Class I (PSD) area. Emissions from the vehicles which are used by the employees of the facility, or those which are used to transport raw material to the facility, haul material around at the facility and to transport product from the facility, are "associated" emissions. If a major new facility were constructed in a small town, and a new school with a heating plant were required, emissions from that new stationary source would also be "associated" emissions.

The determination of whether or not a facility is subject to the PSD provisions of the regulations depends on the total amount of "allowable emissions." Fugitive emissions must be included in the calculation of allowable emissions for certain source categories. Common examples of fugitive emissions include dust generated by traffic on unpaved roads, dust from strip mining activities, organic vapors released at pipe flanges, storage vessels or from drains, and combustion products from open burning.

Fugitive emissions must be included in the calculation of allowable emissions for any facility listed in 18 AAC 50.300(a)(5)(A) or any facility that, as of August 7, 1980, is regulated under section 111 (New Source Performance Standards) or section 112 (National Emission Standards for Hazardous Air Pollutants) of the Clean Air Act. A complete list of source categories for which fugitive emissions must be included in the calculation of allowable emissions is contained in Table IV.F.1-1.

The requirements and review procedures are more rigorous for the construction or modification of a major source or facility in the Anchorage or the Fairbanks/North Pole urban areas which are in violation of the ambient air quality standards for carbon monoxide. The construction or modification of a source or facility which will cause actual or allowable carbon monoxide emissions to increase by more than 100 tons per year requires a Permit to Operate. Application requirements for this circumstance are described in 18 AAC 50.300(d). An application for a permit for a new or modified major source or facility in a non-attainment area, must include applications from one or more other sources offering to reduce emissions of the non-attainment air contaminant to provide "offsets" for the increased emissions from the new or modified source or facility. These applications must be reviewed under the Nonattainment Area Review Procedures described in 18 AAC 50.400(c)(1), (c)(4) and (d)(4).

A permit is also required for the operation of a source or facility for which the owner or operator has requested that the Department approve limits on emission rates or operations to reduce emissions to below those quantities specified in 18 AAC 50. As an example, assume the owner of an existing major facility proposes to install a new unit. If the estimated emissions from the new unit operating continuously at full capacity exceed any of the thresholds specified in 18 AAC 50.300(a)(6)(C)(i)-(xvii), the unit would trigger a PSD review. However, the owner plans to operate the unit seasonally for three months a year. If the increase in emissions, based on three months of continuous operation, would be less than each the thresholds, the owner could apply for a standard permit with a restriction limiting the source to three months of operation each year. A PSD permit application would no longer be required.

## F. PROJECT REVIEW PROCEDURES

This subsection defines the types of facilities that require an Air Quality Control Permit to Operate and describes the application procedures. There are three types of permit review and the application requirements vary depending on the magnitude of the net emission change associated with the addition or modification of a source and where it is located. The three levels of permit review are listed in the table below. The table also provides a reference to the sections of the regulations that define permit applicability criteria and permit application requirements.

| Review Procedures | Source Applicability | Permit Application Requirements |
|---|---|---|
| Standard | 18 AAC 50.300(a)(1)—(4) | 18 AAC 50.300(b) |
| Prevention of Significant Deterioration | 18 AAC 50.300(a)(5)—(6) | 18 AAC 50.300(b)<br>18 AAC 50.300(c)<br>18 AAC 50.300(g) |
| Nonattainment Area Review | 18 AAC 50.300(a)(7) | 18 AAC 50.300(b)<br>18 AAC 50.300(d) |

As noted in the table, the standard permit requirements are also the baseline requirements for PSD and nonattainment area reviews. However, a facility that does not require a standard permit is not necessarily exempt from PSD or new source review requirements for nonattainment areas. This is especially true for modifications to existing facilities. All three sets of applicability criteria should be tested to determine if a permit is required to construct, modify or operate a facility with an air contaminant source.

Even if a facility with an air contaminant source does not require a permit, it must be operated in compliance with one or more of the following emission limits:

- 18 AAC 50.050(a) - Exhaust opacity levels of exhaust
- 18 AAC 50.050(b) - Particulate matter levels of exhaust
- 18 AAC 50.050(c) - Sulfur dioxide emissions
- 18 AAC 50.050(f) - Control of fugitive dust
- 18 AAC 50.090 - In areas of potential ice fog, water emissions must be reduced (required at the Department's discretion)
- 18 AAC 50.100 - Excessive air pollution prohibited

AK Implementation Plan for Air Quality Control

1. **Who Needs a permit**

An Air Quality Control Permit must be issued and in effect for construction, modification, or operation of a facility with one or more air contaminant sources described in the following list:

- any source which requires an air contaminant emission control unit or system to comply with emission standards set by 18 AAC 50.040—18 AAC 50.060, and
  - is an industrial process with a total design rate, capacity, or through-put greater than five tons per hour and physically or chemically treats the material; or
  - is fuel-burning equipment with a rating of 50 million Btu per hour or more;
- fuel-burning equipment rated at 100 million Btu per hour or more;
- an incinerator rated at 1,000 pounds per hour or more;
- municipal wastewater treatment plant sludge incinerator serving 10,000 or more persons and burning waste containing more than 10 percent wastewater treatment plant sludge by dry weight
- coal preparation plant installed or modified after November 1, 1982
- portland cement plant installed or modified after November 1, 1982
- asphalt plant
- petroleum refinery installed or modified after November 1, 1982, and containing a catalytic cracking unit regenerator of any size or a sulfur recovery plant rated at more than 20 long tons per day (any petroleum refinery with equipment meeting the criteria for fuel burning equipment or an industrial process as defined above will require a permit regardless of installation date).

The Prevention of Significant Deterioration (PSD) program is required by federal law and is designed to prevent serious degradation to air quality in areas that currently enjoy clean and healthful air. The Department of Environmental Conservation administers the PSD program in Alaska through its own regulations. An application for an Air Quality Control Permit to Operate must satisfy the PSD application requirements if a facility meets any of the following criteria:

- a facility listed in 18 AAC 50.300(a)(5) with allowable emissions of

    - 100 tons per year or more of an air contaminant regulated under the Clean Air Act, as amended August 7, 1977, is installed after November 1, 1982, and is listed in 18 AAC 50.300(a)(5)(A);

    - less than 100 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 100 tons per year or more;

    - greater than 100 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent PSD permit issued to the facility, causing an increase in actual emissions equal to or exceeding the PSD significant emission rates listed in 18 AAC 50.300(a)(6)(C)(i) — (xviii);

- a facility not listed in 18 AAC 50.300(a)(5) with allowable emissions of

    - 250 tons per year or more of an air contaminant regulated under the Clean Air Act, as amended August 7, 1977, and is installed after November 1, 1982;

    - less than 250 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 250 tons per year or more; or

    - more than 250 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent permit issued to the facility under 18 AAC 50.400(c)(3), causing an increase in actual emissions equal to or exceeding the limitations set in 18 AAC 50.300(a)(6)(C)(i) — (xvii):

The determination of whether or not a facility is subject to the PSD provisions in the regulations depends on the amount of "allowable emissions." "Allowable emissions" means the calculated emission rate of a source or facility using the maximum rated capacity and enforceable limits and conditions on emissions or operations. For example, the allowable sulfur dioxide emissions from an oil-fired boiler would be calculated based on the boiler firing capacity and the heating value and maximum sulfur content of the available fuels. Permit restrictions on the maximum sulfur content in the fuel oil or the annual hours of operation would result in a lower value for allowable emissions.

Fugitive emissions must be included in the calculation of allowable emissions for certain source categories. Fugitive emissions are those emissions which cannot reasonably pass through a stack, vent or other functionally equivalent opening. Common examples include dust generated by traffic on unpaved roads, dust from strip mining activities, and combustion products from open burning.

Fugitive emissions must be included in the calculation of allowable emissions for any facility listed in 18 AAC 50.300(a)(5)(A) or any facility that, as of August 7, 1980, is regulated under section 111 (New Source Performance Standards) or section 112 (National Emission Standards for Hazardous Air Pollutants) of the Clean Air Act. A complete list of source categories for which fugitive emissions must be included in the calculation of allowable emissions is contained in Table IV.F.1-1.

The requirements and review procedures are more rigorous for the construction or modification of a major source or facility in the Anchorage urban area or the Fairbanks/North Pole urban areas that are in violation of the ambient air quality standards for carbon monoxide. The construction or modification of a source or facility which will cause actual or allowable carbon monoxide emissions to increase by more than 100 tons per year requires a Permit to Operate and must be reviewed under the Nonattainment Area Review Procedures.

A permit is also required for the operation of a source or facility for which the owner or operator has requested that the department approve limits on emission rates or operations to reduce emissions to levels below those specified in 18 AAC 50. As an example, assume the estimated emissions from a new unit operating continuously at full capacity would trigger a PSD review. The owner only plans on operating the unit seasonally for three months a year. If emissions based on three months of continuous operation are less than the emission levels specified in 18 AAC 50.300(a)(5) or (6), then the owner could apply for a standard permit with a restriction limiting the facility to three months of operation annually. A PSD permit application would not be required.

Table IV.F.1-1

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

Estimates of allowable emissions from a new or modified facility belonging to a source category on this list must include fugitive emissions (those emissions which cannot reasonably pass through a stack, chimney, vent or other functionally equivalent opening) when determining if the facility is subject to PSD review.

fossil fuel-fired steam generating unit or steam electric plant of more than 250 million BTUs per hour input

fossil fuel-fired boiler or a combination of boilers totaling more than 250 million BTUs per hour heat input

fossil fuel- and wood residue-fired steam generating unit capable of firing fossil fuel at a heat input rate of more than 250 million BTUs per hour

electric utility steam generating unit capable of firing fossil fuel, either alone or in combination with any other fuel, at a heat input rate of more than 250 million BTUs per hour

electric utility combined cycle gas turbines capable of firing fossil fuel in the steam generator at a heat input rate of more than 250 million BTUs per hour

petroleum refinery

incinerator capable of charging more than 50 tons of waste per day

sulfur recovery plant

sewage sludge incinerator burning waste which is more than 10 percent sewage sludge (dry basis) produced by a municipal sewage treatment plant or charging more than 2205 pounds of municipal sewage sludge per day

petroleum storage vessel with a total storage capacity exceeding 65,000 barrels and constructed after June 11, 1973; or exceeding 40,000 barrels and constructed since March 8, 1974; or any petroleum storage and transfer facility with a total storage capacity exceeding 300,000 barrels, regardless of construction date

coal preparation plant

coal cleaning plant with thermal dryers

kraft pulp mill

portland cement plant

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

primary zinc smelter

iron and steel mill plant

primary aluminium ore reduction plant

primary copper smelter

hydrofluoric, sulfuric, or nitric acid plants

lime plant

coke oven battery

carbon black plant (furnace process)

primary lead smelter

fuel conversion plant

sintering plant

secondary metal production plant

chemical process plant

taconite ore processing plant

glass fiber processing plant

charcoal production plant

asphalt concrete plant

brass and bronze ingot production plant

phosphate rock processing plant

wet process phosphoric acid plant

superphosphoric acid plant

diammonium phosphate plant

triple superphosphate plant

granular triple superphosphate storage facility

ferroalloy production facility

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

steel plant electric arc furnace

glass manufacturing plant producing more than 10,000 pounds of glass per day

grain elevator

stationary gas turbine with heat input greater than 10.1 million BTU per hour

automobile and light duty truck surface coating operation

ammonium sulfate manufacturing plant

beryllium sources including:

- extraction plant
- ceramic plant
- foundary
- incinerator
- propellant plant
- machine shop
- rocket motor test site

mercury sources including:

- mercury ore processing
- mercury chlor-alkali cell
- wastewater treatment plant sludge incinerator or dryer

vinyl chloride sources including:

- ethylene dichloride plant
- vinyl chloride plant
- polymerized vinyl chloride plant

Table IV.F.1-1 (continued)

SOURCE CATEGORIES FOR WHICH FUGITIVE EMISSIONS MUST BE INCLUDED IN DETERMINING ALLOWABLE EMISSIONS

asbestos sources including:

- asbestos mill
- roadway
- manufacturing
- waste disposal (manufacturing, demolition, etc.)
- waste disposal (asbestos mill)
- inactive waste disposal site

2. Standard Application Procedures

An application for an Air Quality Control Permit to Operate is to be submitted to the department for review and approval. The addresses for submittal and phone numbers are listed in Table IV.F.2-1. The application must be signed by a principle or executive officer or a duly authorized representative, general partner, proprietor or publicly elected official.

The Department is responsible for granting or denying a permit for which an application is made within **thirty days** following receipt of the complete application. A summary of the basis for issuing or denying a permit will be completed for each application. If additional information is required for review of an application, the department will specify to the applicant the information required, and establish a date by which the information should be received. The time for review of the permit application will be held in abeyance during this period.

The owner/operator of a facility which requires a permit to operate is to submit the permit application to the appropriate Regional Environmental Supervisor. Assistance in understanding the requirements and obtaining supporting data may be obtained through the Department's regional offices, for which addresses and phone numbers are in Table IV.F.2-1.

An application must include the information required by 18 AAC 50.300(b). This section includes what is contained in "INFORMATION REQUIRED -- PERMIT TO OPERATE APPLICATIONS", referenced in FIGURE IV.F-1. For the various classes of emission sources, data is to be provided for each unit and emissions point (stack or vent). If routine variations of the process or upset conditions may result in venting, flaring or other major changes in the nature or rate of emissions, the applicant must indicate the cause(s) of the change, the probability or frequency of occurrence, probable duration and estimated quantity of emissions.

For facilities subject to PSD requirements, the information required in 18 AAC 50.300(c) and as discussed in Section IV.F.3 must also be included. For facilities proposing to locate in a nonattainment area, the information required in 18 AAC 50.300(d) and as discussed in Section IV.F.4 must also be included.

For a new or modified facility, the information to describe the operation may be submitted in a letter or attached to a signed copy of the one page application form shown in Figure IV.F.2-1.

Renewal of a permit must be requested at least thirty days prior to the expiration date, to provide for expeditious reissuance of the permit. A letter requesting renewal and listing all changes made since the previous application is needed.

Amendment of a permit is required if a change in operation or the process occurs, or if a control system is to be slightly modified or replaced. A new permit is required when adding new units of any size to a facility under existing permit, or making modifications to a unit for which the expenditures exceed 50% of the original capital cost of the unit.

TABLE IV.F.2-1

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OFFICES TO SUBMIT AIR QUALTIY CONTROL PERMIT APPLICATIONS

An application should be submitted to the appropriate regional office of the Department.

Regional Environmental Supervisor
Southeast Regional Ofice
410 Willoughby Avenue
Juneau, Alaska 99801-1795
(907) 465-5350
FAX 465-5362

Regional Environmental Supervisor
Northern Regional Office
~~1001 Noble St., Suite 350~~ 610 University Ave.
Fairbanks, AK ~~99701~~ 99709
(907) 451-2360
FAX 451-2187

Regional Environmental Supervisor
Southcentral Regional Office
3601 "C" St., Suite 1334
Anchorage, AK 99503
(907) 563-6529
FAX 562-4026

Information and technical assistance may also be obtained from:

| | | |
|---|---|---|
| Air Quality Control Section, Juneau | 465-5100 | FAX: 465-5274 |
| Ketchikan District Office | 225-6200 | FAX: 225-0620 |
| Sitka District Office | 747-8614 | FAX: 747-7419 |
| Kenai/Soldotna District Office | 262-5210 | FAX: 262-2294 |
| Matanuska-Susitna District Office | 376-5038 | FAX: 376-2382 |
| Valdez District Office | 835-4698 | FAX: 835-2429 |

FIGURE IV.F.2-1

ALASKA DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Date received ________________
File number ________________

APPLICATION FOR
AIR QUALITY CONTROL PERMIT TO OPERATE

I. FIRM NAME ________________________________________

Address ________________________________________

________________________ Telephone No. ____________

LEGAL OWNER ________________________________________

Address ________________________________________

________________________ Telephone No. ____________

II. NAME OF FACILITY:

III. LOCATION OF FACILITY:

IV. NATURE OF OPERATION (Include type of product, production rate, size and history of facility, listing the units having air contaminant emissions and control equipment type and efficiency):

V. LIST OF ATTACHMENTS (Include all information needed to fully describe the facility as outlined in INFORMATION REQUIRED. Identify all attachments and reference material to be included as part of this application:

VI. CERTIFICATION STATEMENT: I certify under penalty of perjury that to the best of my knowledge all of the above information and attachments are true and correct.

________________________ ________________________
SIGNATURE DATE

________________________
TITLE

a. Information Required

The information requested here will generally be adequate as a request for a determination of whether the facility requires a permit. If the facility is subject to Prevention of Significant Deterioration or nonattainment area review, additional information as described in 18 AAC 500.300(c) and (d) will be needed. Depending on the type of facility, one of the following three sections must be filled out.

STANDARDIZED SOURCE

Examples: asphalt plant, diesel engine, gas turbine, incinerator, or similar off-the-shelf unit with standard emission control system(s).

1. type of unit and location

2. rated capacity

    a. if fuel burning: Btu/hr maximum rating, type of fuel and maximum fuel burning rate in pounds, gallons or cubic feet per hour.

    b. if process unit: type of material and maximum rate processed or produced in appropriate weight units, gallons or cubic feet per hour.

    c. if waste burning: type of waste(s) burned, maximum rate in gallons or pounds per hour, type and quantity of auxiliary fuel burned.

3. normal operating schedule

    a. hours/day
    b. days/week
    c. days or weeks/quarter

4. control system(s) installed

    a. type and size (capacity)
    b. efficiency (%)
    c. estimated emissions rates of regulated pollutants

        particulate matter -- lb/hr
        sulfur dioxide -- lb/hr
        nitrogen oxides as $NO/NO_2$ -- lb/hr
        carbon monoxide -- lb/hr

5. stack parameters

    a. height (feet)
    b. diameter (feet)
    c. temperature (°F)
    d. flow rate (acfm, scfm)

SPECIALIZED/LARGE FUEL-BURNING OR INCINERATION SOURCE

1. type of unit

2. type(s) of fuel(s), source of supply, type of waste(s), auxiliary fuel

3. heat content of fuel, Btu/lb, /gal or $/ft^3$

4. sulfur content of fuel, %

5. ash content of fuel, %

6. ash content of unit -- Btu/hr, lb waste/hr, /lb, /gal or $ft^3/hr$

7. fuel consumption -- normal and maximum

8. use of heat

   a. power generation - %
   b. process heat - %
   c. space heat - %

9. normal operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

10. control system(s)

    a. type and size (capacity)
    b. efficiency
    c. control/operating parameters, auxiliary fuel
    d. estimated/actual emissions rates of regulated pollutatnts (indicate whether the rate is based on emission factors, tests or material balances)
       particulate - lb/hr and tons/year
       sulfur dioxide - lb/hr and tons/year
       nitrogen oxides as $NO/NO_2$ - lb/hr and tons/year
       carbon monoxide - lb/hr and tons/year
    e. by-pass or upset conditions, controls (such as flares), frequency of occurence

11. monitoring system(s)

    a. type
    b. location
    c. sampling/testing procedure proposed in lieu of continuous monitoring

12. stack and exhaust parameters

    a. height (feet)
       carbon monoxide - ppm
       particulate matter - grams/scf

PROCESSING SOURCE (not otherwise covered above, including material storage/handling)

1. type of process or treatment

2. type of unit

3. rate of processing, treating or transferring; pounds, gallons or cubic feet, processed, treated, pumped, converted or produced per hour

4. size of storage tanks(s), vessels, type(s) of material stored, vapor pressure

5. operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

6. control system(s)

   a. type and size (capacity)
   b. efficiency
   c. control/operating parameters
   d. estimated/actual emissions rates of regulated pollutants (indicate whether the rate is based on emission factors, tests, or material balances)
      particulate matter - lb/hr
      sulfur dioxide - lb/hr
      nitrogen oxides - lb/hr $NO/NO_2$
      hydrocarbons - lb/hr
      carbon monoxide - lb/hr
   e. by-pass, venting or other upset conditions, controls, probable frequency

7. monitoring system(s)

   a. type
   b. location
   c. sampling/testing procedure proposed in lieu of continuous monitoring

8. stack and exhaust parameters

   a. height (feet)
   b. diameter (feet)
   c. temperature (°F)
   d. flow rate (acfm and scfm)
   e. concentration of regulated pollutants

In addition to the above information, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

° installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;

b. Additional Considerations

In addition to the information requirements contained in section a, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

- ° installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;
- ° use of water or chemicals for dust control in the demolition of existing structures, construction operations, road grading, or land clearing; and
- ° application of asphalt, oil, water, or suitable chemicals on dirt roads, material stockpiles and other surfaces which can create airborne dusts.

Stack Injection

The regulations allow for injection of materials into exhaust streams other than for pollution control only with written approval from the department. It is the intent of the department not to allow such practices unless it is the most environmentally sound procedure for disposal of the material. The applicant must prove:

- ° the combined exhaust can meet emission standards and opacity limitations for that source; this will require an engineering analysis with documentation of similar sources, source tests after installation at maximum operating conditions, and may include continuous emission monitoring;
- ° the combined exhaust can meet applicable ambient air quality standards and increments; this will require atmospheric modeling to show downwind concentrations with and without the injection material, modeling will be in accordance with established state guidelines;
- ° the combined exhaust will not cause the downwind concentration of an air contaminant for which no ambient air quality standard is established to exceed a level determined by the department to be injurious to human health or welfare;
- ° the residence time and stack temperature are sufficient to cause total burning of the material;
- ° that no other environmentally sound procedure is available such as dewatering and incineration, hauling to a nearby area or treatment facility, or inexpensive further treatment for eventual discharge; and
- ° the material will not degrade or erode the proposed control equipment.

In addition, the amount and content of injected material from a laboratory analysis is required, along with a rigorous discussion of operating parameters to guarantee the material will be injected at a controlled rate.

Stack Heights and Dispersion Techniques

The department has promulgated regulations, consistent with the Clean Air Act and federal regulations, which set limits on the use of tall smokestacks and other dispersion techniques in ambient air modeling for the purpose of setting an emission limit or calculating the air quality impact of a source. This may be necessary if a source meets the applicable federal and state emission standards but still poses the potential to cause air quality standards or PSD increments to be exceeded.

The regulations do not limit the physical stack height for any source or the actual use of dispersion techniques. Sources are modeled at their actual physical stack height unless the actual height exceeds the height defined in 18 AAC 59.900(23) as "good engineering practice" (GEP). If the actual stack height is greater than the GEP stack height only the GEP stack height can be used to estimate ambient air contaminant concentrations resulting from emissions from the stack and to establish the emission limit for the source. As of June 1987 there are no sources in Alaska for which stack height needs to be considered in setting the emission limit.

Prior to June 7, 1987, the department's regulations allowed the creditable stack height to be automatically increased to prevent the plume emanating from the smokestack from impacting on hillsides or mountains. The current regulations limit the extent to which dispersion can be substituted for actual emission reductions in order to minimize ambient air contaminant concentrations in these cases.

Stack height is always measured from ground level at the base of the stack or, for a source located offshore, from mean lower, low water. The GEP or maximum creditable stack height can be determined in three ways:

1) any stack up to 65 meters in height can be credited at the full actual height.

2) GEP stack height greater than 65 meters can be calculated by a formula based on the dimensions of nearby buildings:

   GEP stack height = (building height) + [1.5 x (lesser of building height or width)]

   The department may require field studies or computerized fluid model demonstrations to verify that the height allowed by formula is necessary in cases where the formula is suspected to overstate the appropriate stack height credit.

3) GEP stack height greater than allowed by the formula can be established with a computerized model or a field study. The modeling demonstration or field study must show that the additional height is necessary to avoid "excessive concentrations" due to downwash induced by "nearby" buildings, hills or mountains. The department will provide the public with the opportunity to review and comment on any proposal to permit a facility credited for stack height greater than the GEP formula height.

The terms "excessive concentration" and "nearby" used in describing the GEP formula and modeling demonstration have very specific definitions contained in 18 AAC 50.900(20) and (29). A height greater than allowed by the formula may only be credited if the height is necessary to avoid an "excessive concentration" defined as increase in ground-level ambient contamination concentration that

1) is 40 percent greater than the concentration that is predicted to occur without considering the effects of plume downwash, and

2) exceeds an ambient air quality standard or, for sources subject to the PSD provisions, a PSD increment.

The question of whether buildings and features may be considered to account for downwash in the formula or in modeling demonstrations is resolved in the definition of "nearby" [18 AAC 59.900(20)]. For applying the formula, a structure is considered nearby if it lies within a distance from the stack that is equal to five times the lesser demension of the height or width of the structure. The maximum distance to be considered "nearby" is 0.8 kilometer. For modeling demonstrations, a terrain feature farther than 0.8 kilometer from the stack may be considered "nearby" if it meets the criteria in 18 AAC 50.900(29)(B).

For the purpose of increasing the creditable stack height for an existing source to a height greater than that calculated by the formula, the emission rate used in the modeling demonstration must not exceed the emission levels required by federal New Source Performance Standards (NSPS) or to a level representing the lowest feasible emission limit. If the owner or operator of an existing source can demonstrate to the department that it is infeasible to control emissions to NSPS levels, then an alternative limit representing the lowest feasible emission limit must be approved by the department before obtaining credit for stack height in excess of the GEP formula height. Factors such as remaining plant life and the cost of modifying existing equipment may be considered when determining the feasible emission limit.

If the objective is only to increase the creditable stack height for an existing source, up to, but not greater than, the GEP formula height, the emission rate used in the modeling demonstration must be the existing emission limit or the actual emission rate if no limit is specified. For these sources, the definition of an "excessive concentration" can also be met by the actual presence of a local nuisance caused by emissions from the existing stack.

Besides excessive stack height, prohibited dispersion techniques include intentionally varying the emission rate according to weather conditions or ambient contaminant concentrations. There are certain dispersion techniques that can be allowed in establishing emission limits. Generally, techniques which increase the plume rise, such as heating the exhaust gas stream or combining exhaust gases from several existing stacks into one stack, is creditable for sources as long as the sulfur dioxide emissions from the entire facility are less than 5,000 tons per year. For facilities whose sulfur dioxide emissions exceed 5,000 tons per year, certain techniques to increase plume rise may be creditable if they qualify for the prohibition exemptions outlined in 18 AAC 50.900(16)(C)(i)--(iii).

TABLE IV.F.2-1

## ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION OFFICES TO SUBMIT AIR QUALTIY CONTROL PERMIT APPLICATIONS

An application should be submitted to the appropriate regional office of the Department.

Regional Environmental Supervisor
Southeast Regional Ofice
410 Willoughby Avenue
Juneau, Alaska 99801-1795
(907) 465-5350
FAX 465-5362

Regional Environmental Supervisor
Northern Regional Office
~~1001 Noble St., Suite 350~~ 610 University Ave.
Fairbanks, AK ~~99701~~ 99709
(907) 451-2360
FAX 451-2187

Regional Environmental Supervisor
Southcentral Regional Office
3601 "C" St., Suite 1334
Anchorage, AK 99503
(907) 563-6529
FAX 562-4026

Information and technical assistance may also be obtained from:

| | | |
|---|---|---|
| Air Quality Control Section, Juneau | 465-5100 | FAX: 465-5274 |
| Ketchikan District Office | 225-6200 | FAX: 225-0620 |
| Sitka District Office | 747-8614 | FAX: 747-7419 |
| Kenai/Soldotna District Office | 262-5210 | FAX: 262-2294 |
| Matanuska-Susitna District Office | 376-5038 | FAX: 376-2382 |
| Valdez District Office | 835-4698 | FAX: 835-2429 |

FIGURE IV.F.2-1

ALASKA DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Date received ____________
File number ____________

## APPLICATION FOR
## AIR QUALITY CONTROL PERMIT TO OPERATE

I. FIRM NAME ____________________________________________

Address ____________________________________________

____________________ Telephone No. ____________

LEGAL OWNER ____________________________________________

Address ____________________________________________

____________________ Telephone No. ____________

II. NAME OF FACILITY:

III. LOCATION OF FACILITY:

IV. NATURE OF OPERATION (Include type of product, production rate, size and history of facility, listing the units having air contaminant emissions and control equipment type and efficiency):

V. LIST OF ATTACHMENTS (Include all information needed to fully describe the facility as outlined in INFORMATION REQUIRED. Identify all attachments and reference material to be included as part of this application:

VI. CERTIFICATION STATEMENT: I certify under penalty of perjury that to the best of my knowledge all of the above information and attachments are true and correct.

____________________ ____________________
SIGNATURE DATE

____________________
TITLE

a. Information Required

The information requested here will generally be adequate as a request for a determination of whether the facility requires a permit. If the facility is subject to Prevention of Significant Deterioration or nonattainment area review, additional information as described in 18 AAC 500.300(c) and (d) will be needed. Depending on the type of facility, one of the following three sections must be filled out.

STANDARDIZED SOURCE

Examples: asphalt plant, diesel engine, gas turbine, incinerator, or similar off-the-shelf unit with standard emission control system(s).

1. type of unit and location

2. rated capacity

   a. if fuel burning: Btu/hr maximum rating, type of fuel and maximum fuel burning rate in pounds, gallons or cubic feet per hour.

   b. if process unit: type of material and maximum rate processed or produced in appropriate weight units, gallons or cubic feet per hour.

   c. if waste burning: type of waste(s) burned, maximum rate in gallons or pounds per hour, type and quantity of auxiliary fuel burned.

3. normal operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

4. control system(s) installed

   a. type and size (capacity)
   b. efficiency (%)
   c. estimated emissions rates of regulated pollutants

      particulate matter -- lb/hr
      sulfur dioxide -- lb/hr
      nitrogen oxides as $NO/NO_2$ -- lb/hr
      carbon monoxide -- lb/hr

5. stack parameters

   a. height (feet)
   b. diameter (feet)
   c. temperature (°F)
   d. flow rate (acfm, scfm)

SPECIALIZED/LARGE FUEL-BURNING OR INCINERATION SOURCE

1. type of unit

2. type(s) of fuel(s), source of supply, type of waste(s), auxiliary fuel

3. heat content of fuel, Btu/lb, /gal or /$ft^3$

4. sulfur content of fuel, %

5. ash content of fuel, %

6. ash content of unit -- Btu/hr, lb waste/hr, /lb, /gal or $ft^3$/hr

7. fuel consumption -- normal and maximum

8. use of heat

   a. power generation - %
   b. process heat - %
   c. space heat - %

9. normal operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

10. control system(s)

    a. type and size (capacity)
    b. efficiency
    c. control/operating parameters, auxiliary fuel
    d. estimated/actual emissions rates of regulated pollutatnts (indicate whether the rate is based on emission factors, tests or material balances)
       particulate - lb/hr and tons/year
       sulfur dioxide - lb/hr and tons/year
       nitrogen oxides as $NO/NO_2$ - lb/hr and tons/year
       carbon monoxide - lb/hr and tons/year
    e. by-pass or upset conditions, controls (such as flares), frequency of occurence

11. monitoring system(s)

    a. type
    b. location
    c. sampling/testing procedure proposed in lieu of continuous monitoring

12. stack and exhaust parameters

    a. height (feet)
       carbon monoxide - ppm
       particulate matter - grams/scf

PROCESSING SOURCE (not otherwise covered above, including material storage/handling)

1. type of process or treatment

2. type of unit

3. rate of processing, treating or transferring; pounds, gallons or cubic feet, processed, treated, pumped, converted or produced per hour

4. size of storage tanks(s), vessels, type(s) of material stored, vapor pressure

5. operating schedule

   a. hours/day
   b. days/week
   c. days or weeks/quarter

6. control system(s)

   a. type and size (capacity)
   b. efficiency
   c. control/operating parameters
   d. estimated/actual emissions rates of regulated pollutants (indicate whether the rate is based on emission factors, tests, or material balances)
      particulate matter - lb/hr
      sulfur dioxide - lb/hr
      nitrogen oxides - lb/hr $NO/NO_2$
      hydrocarbons - lb/hr
      carbon monoxide - lb/hr
   e. by-pass, venting or other upset conditions, controls, probable frequency

7. monitoring system(s)

   a. type
   b. location
   c. sampling/testing procedure proposed in lieu of continuous monitoring

8. stack and exhaust parameters

   a. height (feet)
   b. diameter (feet)
   c. temperature (°F)
   d. flow rate (acfm and scfm)
   e. concentration of regulated pollutants

In addition to the above information, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

- installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;

b. Additional Considerations

In addition to the information requirements contained in section a, the following requirements must be addressed if applicable to the facility.

Fugitive Emissions/Dust Control

All sources of air pollution in the state whether required to obtain a permit or not, must comply with 18 AAC 50.050(f). Reasonable precautions shall include but are not limited to:

° installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials;

° use of water or chemicals for dust control in the demolition of existing structures, construction operations, road grading, or land clearing; and

° application of asphalt, oil, water, or suitable chemicals on dirt roads, material stockpiles and other surfaces which can create airborne dusts.

Stack Injection

The regulations allow for injection of materials into exhaust streams other than for pollution control only with written approval from the department. It is the intent of the department not to allow such practices unless it is the most environmentally sound procedure for disposal of the material. The applicant must prove:

° the combined exhaust can meet emission standards and opacity limitations for that source; this will require an engineering analysis with documentation of similar sources, source tests after installation at maximum operating conditions, and may include continuous emission monitoring;

° the combined exhaust can meet applicable ambient air quality standards and increments; this will require atmospheric modeling to show downwind concentrations with and without the injection material, modeling will be in accordance with established state guidelines;

° the combined exhaust will not cause the downwind concentration of an air contaminant for which no ambient air quality standard is established to exceed a level determined by the department to be injurious to human health or welfare;

° the residence time and stack temperature are sufficient to cause total burning of the material;

° that no other environmentally sound procedure is available such as dewatering and incineration, hauling to a nearby area or treatment facility, or inexpensive further treatment for eventual discharge; and

° the material will not degrade or erode the proposed control equipment.

In addition, the amount and content of injected material from a laboratory analysis is required, along with a rigorous discussion of operating parameters to guarantee the material will be injected at a controlled rate.

## Stack Heights and Dispersion Techniques

The department has promulgated regulations, consistent with the Clean Air Act and federal regulations, which set limits on the use of tall smokestacks and other dispersion techniques in ambient air modeling for the purpose of setting an emission limit or calculating the air quality impact of a source. This may be necessary if a source meets the applicable federal and state emission standards but still poses the potential to cause air quality standards or PSD increments to be exceeded.

The regulations do not limit the physical stack height for any source or the actual use of dispersion techniques. Sources are modeled at their actual physical stack height unless the actual height exceeds the height defined in 18 AAC 59.900(23) as "good engineering practice" (GEP). If the actual stack height is greater than the GEP stack height only the GEP stack height can be used to estimate ambient air contaminant concentrations resulting from emissions from the stack and to establish the emission limit for the source. As of June 1987 there are no sources in Alaska for which stack height needs to be considered in setting the emission limit.

Prior to June 7, 1987, the department's regulations allowed the creditable stack height to be automatically increased to prevent the plume emanating from the smokestack from impacting on hillsides or mountains. The current regulations limit the extent to which dispersion can be substituted for actual emission reductions in order to minimize ambient air contaminant concentrations in these cases.

Stack height is always measured from ground level at the base of the stack or, for a source located offshore, from mean lower, low water. The GEP or maximum creditable stack height can be determined in three ways:

1) any stack up to 65 meters in height can be credited at the full actual height.

2) GEP stack height greater than 65 meters can be calculated by a formula based on the dimensions of nearby buildings:

   GEP stack height = (building height) + [1.5 x (lesser of building height or width)]

   The department may require field studies or computerized fluid model demonstrations to verify that the height allowed by formula is necessary in cases where the formula is suspected to overstate the appropriate stack height credit.

3) GEP stack height greater than allowed by the formula can be established with a computerized model or a field study. The modeling demonstration or field study must show that the additional height is necessary to avoid "excessive concentrations" due to downwash induced by "nearby" buildings, hills or mountains. The department will provide the public with the opportunity to review and comment on any proposal to permit a facility credited for stack height greater than the GEP formula height.

The terms "excessive concentration" and "nearby" used in describing the GEP formula and modeling demonstration have very specific definitions contained in 18 AAC 50.900(20) and (29). A height greater than allowed by the formula may only be credited if the height is necessary to avoid an "excessive concentration" defined as increase in ground-level ambient contamination concentration that

1) is 40 percent greater than the concentration that is predicted to occur without considering the effects of plume downwash, and

2) exceeds an ambient air quality standard or, for sources subject to the PSD provisions, a PSD increment.

The question of whether buildings and features may be considered to account for downwash in the formula or in modeling demonstrations is resolved in the definition of "nearby" [18 AAC 59.900(20)]. For applying the formula, a structure is considered nearby if it lies within a distance from the stack that is equal to five times the lesser demension of the height or width of the structure. The maximum distance to be considered "nearby" is 0.8 kilometer. For modeling demonstrations, a terrain feature farther than 0.8 kilometer from the stack may be considered "nearby" if it meets the criteria in 18 AAC 50.900(29)(B).

For the purpose of increasing the creditable stack height for an existing source to a height greater than that calculated by the formula, the emission rate used in the modeling demonstration must not exceed the emission levels required by federal New Source Performance Standards (NSPS) or to a level representing the lowest feasible emission limit. If the owner or operator of an existing source can demonstrate to the department that it is infeasible to control emissions to NSPS levels, then an alternative limit representing the lowest feasible emission limit must be approved by the department before obtaining credit for stack height in excess of the GEP formula height. Factors such as remaining plant life and the cost of modifying existing equipment may be considered when determining the feasible emission limit.

If the objective is only to increase the creditable stack height for an existing source, up to, but not greater than, the GEP formula height, the emission rate used in the modeling demonstration must be the existing emission limit or the actual emission rate if no limit is specified. For these sources, the definition of an "excessive concentration" can also be met by the actual presence of a local nuisance caused by emissions from the existing stack.

Besides excessive stack height, prohibited dispersion techniques include intentionally varying the emission rate according to weather conditions or ambient contaminant concentrations. There are certain dispersion techniques that can be allowed in establishing emission limits. Generally, techniques which increase the plume rise, such as heating the exhaust gas stream or combining exhaust gases from several existing stacks into one stack, is creditable for sources as long as the sulfur dioxide emissions from the entire facility are less than 5,000 tons per year. For facilities whose sulfur dioxide emissions exceed 5,000 tons per year, certain techniques to increase plume rise may be creditable if they qualify for the prohibition exemptions outlined in 18 AAC 50.900(16)(C)(i)--(iii).

## 3. PSD Application Procedures

The owner/operator of a source or facility described in 18 AAC 50.300 (a)(5) and (a)(6) is subject to review under the Prevention of Significant Deterioration (PSD) provisions. Due to the length of time and the costs required to prepare an approvable application, the department encourages frequent consultation between the applicant and the department to avoid undue delays which might result from use of inadequate or inappropriate modelling or monitoring procedures.

A full PSD application consists of these major aspects:

° Control technology review/Best Available Control Technology determination.

° Air quality analysis - an analysis of existing air quality and a determination that the applicable ambient air quality standards or increments will not be exceeded.

° Air quality monitoring - up to one year's measurement of appropriate meterological and air quality parameters.

° Additional impact analysis - an analysis of the effect on visibility,

Volatile organic compounds and reduced sulfur compunds are two emissions whose constituency are not inherently obvious. The definition for VOC's is in 40 CFR 60.2, the NSPS definitions as described in the December 24, 1980 Federal Register. VOC's do not include methane and ethane. The complete list of hydrocarbons not included as a VOC is in the September, 1980, document EPA 450/2-77-028 "Procedures for the Preparation of emission Inventories for VOC's "Volume 1, 2nd Edition, pages 2-10 and 2-11. The definition for reduced sulfur compounds is in 40 CFR 60.010(e) (subpart J) Reduced sulfur compounds only include hydrogen sulfide, carbonyl sulfide and carbon disulfide."

### Preliminary Report and Meeting

At the earliest date possible and prior to conducting any air monitoring, the applicant is encouraged to submit to the department a preliminary description of the project, and an air quality analysis including recommendation on the need for monitoring various environmental parameters. A monitoring program may follow which can be up to one year's duration. A detailed analysis of the data gathered must be made, and a final report sent to the reviewing agency. The agency will prepare an assessment of the report, provide for public comment, and make its final determination.

The applicant should present a preliminary report which includes:

- a brief description of the project; process data, design parameters, stack heights, diameters, exhaust flow rates, exhaust temperatures, plot plan if more than one stack, a topographic map at least 1:62500 with proposed facilities marked, and the proposed control systems - NSPS requirements if applicable or process-related controls which reduce emissions.

- the results of an in-depth analysis of the increase in total concentration of each pollutant emitted by the facility based on:

  - emission data from plant design or source tests.
  - available or estimated meteorological data.
  - available or estimated air quality data.
  - determination of background air quality such as emissions data from other sources or an assumed "background" level.

- the results of calculations of ambient air quality performed for each stability class and a range of wind speeds likely to occur at the site. Ground level concentrations of each pollutant will be determined for the appropriate time periods such as; 1 hour, 3 hours, 8 hours, 24 hours, season and year, out to where the impact is one microgram. This would include a presentation of the maximum ground level concentration calculations, complete with the assumptions used and a description of the conditions needed for the occurrence of these concentrations.

- a summary of the concentration data in appropriate units printed on maps using a 1 km grid. Appropriate wind rose and stability class(es) should be presented on each map. Presentations are needed for conditions which yield a maximum value for each stability class considered, and for 24-hour seasonal, and annual periods.

- a discussion of the applicability and drawbacks of the model(s) used, and limitations of data or assumptions used.

- a recommendation for an air quality monitoring network, including special studies, if appropriate, for preparing a refined analysis of the project.

The owner or operator of a proposed new or modified PSD facility will not be required to conduct air quality monitoring for specific pollutants if one of the following is demonstrated:

- the annual increase in emissions is less than that set in 18 AAC 50.300(a)(6)(C)(i-xvii)

- the concentration of a pollutant in the area of the source is equal to or less than that set in 18 AAC 50.510(b)

- the estimated air quality impact from increased emissions is equal to or less than that set in 18 AAC 50.510(b)

The applicant should send the preliminary report to the reviewing agency and allow at least one week for agency analysis. After initial agency review, a conference (with consultants if possible) to review the project and report with the reviewing agency should be arranged by the applicant.

At this conference the applicant should be prepared to discuss the procedures used for calculating the maximum ground-level concentrations and the models used. Justification of any variance from EPA standard procedures and guidelines must be presented. The effects of associated growth, the various control options for reducing pollution and the need for ambient monitoring will also be discussed. The department will offer technical assistance and recommendations concerning the applicant's plans. However,

the applicant will be solely responsible to justify and adequately demonstrate compliance with all PSD requirements.

Based on the meeting with the reviewing agency, the applicant should determine if the work already completed proves the ambient air will not be significantly degraded around the proposed facility. In this case, a final application should be prepared and submitted by the applicant.

Pre-Construction Monitoring

A new or modified facility subject to PSD review must monitor meteorological parameters and existing ambient air quality for up to one year prior to approval of a permit application. The parameters for which monitoring is required will be specified by the department.

Examples include wind direction, wind speed, temperature, sulfur dioxide, particulate matter, ozone, oxides of nitrogen and carbon monoxide, and visibility monitoring. The department will waive this requirement or approve a reduced monitoring program if adequate data is already available, if the proposed site is in an undeveloped area where pollutant levels are below those in 18 AAC 50.510(b), or if the estimated change in air quality is below the levels in 18AAC 50.510(b).

Where ambient monitoring is required the department will establish the size and type of monitoring network after consultation with the applicant. The criteria for determining the type and extent of the monitoring network will include the size, type, and location of the facility, quantity/type of emissions, available PSD increment, and existing data. Basic requirements for an approvable monitoring network are:

- Continuous meteorological stations are required at the proposed facility site and one or more other sites to characterize the meteorology of the airshed.

- Continuous ambient sulfur dioxide monitor(s) are required at the site of the facility and possibly at one or more points which may be affected by the plume if the ambient level of $SO_2$ in the airshed is, or is estimated to be, greater than 13 micrograms per cubic meter for a 24-hour average. A standby monitor or adequate supply of repair parts will be required to assure continuous data acquisition.

- Particulate matter sampling are required at one site using a standard collection device taking a 24-hour sample every three or six days. The location of the monitor will generally be at the site of the facility. Additional monitoring sites may be required, particularly at sensitive sites such as boundaries of Class I areas in vicinity of the project.

- When the facility is located near or within the boundaries of the Municipality of Anchorage or the Fairbanks North Star Borough, one or more continuous monitors may be required to augment the existing monitoring network.

The applicant is to prepare a monitoring program plan and submit it to the reviewing agency prior to implementation. After allowing one week for agency analysis, the applicant should schedule a meeting with the reviewing agency if needed to finalize the following aspects of the proposed program:

Design of Monitoring Network

Site locations; variance from EPA siting criteria
Meteorological monitoring
Pollutant monitoring parameters; justify non-monitoring, short-term monitoring, or intermittent sampling frequency
Quality assurance program; Instrument maintenance
Special studies, such as stability class determinations, plume behavior studies, inversion levels

Upon review and tentative approval by the reviewing agency the applicant should proceed with the setup of a monitoring network. After setup, the applicant is to have an independent group evaluate monitor siting, evaluate instrument calibration, and determine compliance with performance standards. Halfway into the study, the applicant should check all meteorological data to see if additional sites are necessary, discuss with the reviewing agency the information gathered during initial operation of the network, and implement any recommendations.

Near the end of the monitoring study, the applicant should prepare an evaluation of the growth of the community and nearby communities, increased traffic, attraction of other industries, and any other activities which are likely to cause changes in ambient air quality as a result of construction and operation of this facility, and prepare the additional analyses of impacts or visibility, vegetation, soils and terrain. This information should be sent in a draft analysis for review so everyone involved will be satisfied with the final report's completeness. This analysis need not necessarily present results and conclusions. All the information -- except for the final impact analysis -- <u>should be complete</u>, including BACT data.

An outline of how the impact analysis will be presented should be included.

Modelling Procedures
Applicability of the selected model(s) to the project and site
Model validation (using existing sources of pollutants, tracer gas studies, determination of stability classes, inversion levels/ strengths, etc.)
Recording and storage of data
Data handling and submittal

<u>Associated Growth Analysis</u>

This evaluation of the changes in ambient air resulting from associated growth will include the emissions from sources other than from the new or modified facility receiving the permit. These include:

- construction of the facility
- ships, trains, or other material or product transfer schemes
- new or modified offsite support facilities such as power plants
- fugitive emissions from use of roads or material handling
- emissions from small camps or home heating units
- in areas of concern, emissions from mobile sources such as cars and trucks.

The term includes only permanent activities started within one year after completion of the project. However, it does not include a pollutant source whose maximum yearly emissions are less than ten tons per year. Similar pollution categories must be summed to compare to this exemption. Associated growth emissions are not counted as part of the levels that trigger a PSD

analysis (such as 100/250 tons). The growth itself may be subject to a separate PSD analysis as in the case of an associated power plant.

Requirements for preparing and submitting a PSD application which are not specified as regulations include the following:

- 40 CFR 51.24 published in Federal Register Vol. 45 No. 154 August 7, 1980, pp. 52676-52784

- EPA-450/4-80-012, November 1980 "Ambient Monitoring Guidelines for Prevention of Significant Deterioration"

- 40 CFR 58 Appendix B "Quality Assurance Requirements for Prevention of Significant Deterioration Air Monitoring"

- EPA-450/4-77-001, October 1977 "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10 (revised), Procedures for Evaluating Air Quality Impact of New Stationary Sources", OAQPS #1.2-029R, October 1977

- OAQPS No. 1.2-080, April 1978 "Guidelines on Air Quality Models"

- OAQPS No.1.2-097, May 1978 "Workbook for the Comparison of Air Quality Models"

- Draft EPA "Guideline for Determining Best Available Control Technology", December 1978

- 40 CFR Parts 60 and 61

- ADEC Ambient Analysis Procedures, Vol. III, State Air Quality Control Plan

- PSD Workshop Manual, October 1980

<u>PSD Application Format</u>

After the monitoring period is over, the applicant is to submit a PSD application for review in this general format:

1.0 SHORT SUMMARY
Scope of project
Result of study, summary of conclusions

2.0 INTRODUCTION
Description of project
How to read rest of book

3.0 DESCRIPTION OF PROJECT
Site location; existing facilities; land use; existing air quality
Environmental setting; power/water availability; topography, meteorology
nonattainment area(s) or Class I areas; other air quality concerns
Process description; plot plans; construction schedule
Type of pollutants; rate of emissions with and without controls
Control equipment; cost; efficiency; energy consumption
Maximum operating design capacity; normal operating rates

4.0 MONITORING AND ANALYSIS STUDY

Pollutants monitored; locations; rationalization for study
Justification for variance from EPA criteria
Maps, graphs or photos of monitoring stations
Quality assurance certification; chain of custody discussion
Instrumentation; Data reporting/handling
Special studies

5.0 ENVIRONMENTAL IMPACT

Comparison with regulations (incremental increases, resulting levels)
Map presentations of results on a grid with wind speeds and stability classes indicated
Discussion of intermittent, seasonal, or temporary operations, upsets
Nonattainment area and/or Class I area impacts
Associated growth
Impact on vegetation, soils, and terrain/impairment of visibility
Upset operations/control, short-term impacts
Solid/liquid effluent from control system

6.0 ALTERNATIVES

Fuel type changes, BACT choices, locations, other processes
Not building at all, socio-economic impacts of non-action

7.0 CONCLUSIONS

Detailed discussion and summary
Proposal for post-construction monitoring/modeling

8.0 APPENDIX

Data, references, regulations, parties involved

4. Nonattainment Application Procedures

New or existing sources of a pollutant not in attainment with ambient air standards that wish to increase emissions of that pollutant in a nonattainment area must obtain a permit from the department. This permit will contain conditions which will prevent growth in the area's emissions of the nonattainment pollutant that would delay the attainment date. A permit is required for a source or facility installed, reconstructed or modified after July 1, 1979, or after the date of the most recent nonattainment permit issued to the facility since July 1, 1982, located in a nonattainment area, and causing an increase in actual or allowable carbon monoxide emissions, whichever is greater, of 100 tons per year or more (18 AAC 50.300 (a)(7)).

The application for the proposed facility must contain the standard information listed in 18 AAC 50.300(b) and the requirements in 18 AAC 50.300(d). The application is to contain proof the lowest achievable emission rate for the nonattainment pollutant (18 AAC 50.300(d)(1)) will be used. This is defined as "that rate of emissions which reflect the most stringent emission limitation of any state, or any emission control which has been achieved in practice by comparable sources." The application must also show the emissions for the nonattainment pollutant will not exceed the applicable emission allowance (18 AAC 50.300(d)(1)).

The term "emission allowance" means, for each nonattainment pollutant, the amount of air contaminant emissions allowed from new or modified facilities, as defined in each applicable local air quality control plan, which will not interfere with attainment of ambient air quality standards. In addition, other sources owned or operated by the applicant (or by any entity controlling, controlled by, or under common control with such person) in the state must be in compliance with requirements of the Clean Air Act as amended August 1977 and state air regulations (18 AAC 50.300(d)(2)).

Facilities near a nonattainment area

If an applicant proposes to build a facility or modify an existing facility and the location is near a non-attainment area, an analysis is needed to show that the pollution will not prevent or interfere with the attainment of the ambient air standard currently not in attainment (18 AAC 50.400(c)(1)).

For facilities subject to PSD analysis, they would need to show the increase within the nonattainment area is less than 500 micrograms per cubic meter for an eight-hour average and less than 2000 microgrms per cubic meter for a one-hour average. For facilities not subject to PSD, a similar analysis may be necessary if the increased emissions are estimated to be greater than 100 tons per year.

## G. APPLICATION REVIEW AND PERMIT DEVELOPMENT

### 1. Application review

The ADEC Operations Division or Air Quality staff shall:

- Obtain emissions data, facility design, proposed emission control system, and the exhaust point conditions from the applicant's Air Quality Control Permit to Operate Application and attachments.

- Confirm the applicability of 18 AAC 50, NSPS, or NESHAPs, and for those facilities subject to State review, estimate the total annual controlled and allowable emissions using AP-42 or other applicable emission factors for comparison with the applicant's estimates.

  If the facility is modified, determine the current allowable emissions and the net change in actual emissions from the facility of each type of pollutant and compare them to the levels in 18 AAC 50.300(a)(5), (a)(6) and (a)(7). A net change results from the decreases in actual emissions from existing sources and the increases in allowable emissions from new or modified sources. Credits from decreases can only be given to the same pollutant. No credit can be given for decreases from current active emissions to current allowable emissions. If an existing source in a NSPS category is reconstructed, it shall be subject to the NSPS regulation irrespective of any change in emissions.

  - If the regulations are not applicable and the design is adequate to meet visibility and emissions standards specified in 18 AAC 50, notify the applicant in writing a permit is not required and the facility appears designed to comply with applicable emissions regulations.

  - If the change in emissions does not subject the facility to PSD or nonattainment area permit review, determine applicability of 18 AAC 50.300 and issue an Air Quality Permit to Operate as appropriate, following the remaining steps described in this section.

  - If the change in emissions does subject the facility to PSD review, notify the applicant of this determination and follow the procedures in Section IV.G.2.

  - If the increase in emissions does subject the facility to nonattainment area review, notify the applicant of this determination and follow the procedures in Section IV.G.4.

- Evaluate the control system design to determine if the facility complies with applicable 18 AAC 50, NSPS, or NESHAPs emissions concentrations/rate requirements. If the facility is subject to PSD review, determine if adequate justification has been presented that the best available control technology has been proposed to reduce emissions of each pollutant. If the facility is located in a nonattainment area, determine if technology has been proposed to control the nonattainment pollutant to the lowest achievable emission rate.

  - If the design or control system is inadequate, write a "Certified Mail Return Receipt Requested" letter to the applicant citing the reasons ADEC feels the facility cannot comply with regulations. Request source tests or other data from equivalent or similar facilities to determine the capacity of the proposed source to comply with applicable requirements. It is not necessary to deny the application at this time.

- If the facility design is adequate perform the impact review.

° Evaluate the impact on ambient air quality to determine what incremental increase of each pollutant might be attributed to the source. Compare this evaluation with the results of the applicant's analysis.

  - For most facilities, the analysis procedures as described in the Appendix are sufficient.

  - For facilities located in complex terrain, in areas with a number of other facilities, in or near a Class I area, near a nonattainment area or in areas where the remaining increment is small, sophisticated modelling may be required. The review will make sure the analysis supplied by the applicant is appropriate to the source and location, the input data is accurate and representative, the modelling procedure is applicable, and all assumptions and procedures are justified. Independent modeling analyses should be performed to compare with the results of the applicant's studies.

Impacts upon ambient air quality standards or increments are to be assessed through the utilization of air quality models, data bases and other techniques presented in the "Ambient Analysis Procedures" found in the Appendix.

Based on the conclusion the facility is capable/incapable of complying with all applicable standards and increments, the review staff shall send an analysis describing the basis for recommending approval/disapproval of the project to the permit signer.

° Approve: Write an Air Quality Control Permit to Operate. Include requirements for appropriate stack or ambient monitoring and reporting to ensure compliance with emissions regulations, ambient air quality regulations, and to measure the incremental change in ambient air quality.

  If additional information is required to complete the review of an application, prepare a brief informative summary of the department's analysis of the application for publication in a newspaper of general circulation in the area affected by the proposed project. The announcement should describe the department's preliminary determination of the acceptability of the application, invite written public comment, and provide opportunity to request a public hearing. If a hearing is requested, it will be held in accordance with applicable statutes and regulations.

° Disapprove: Write a Certified Mail Return Receipt letter disapproving the application and prohibiting operation. State the reason(s) for the denial. Notify the applicant of his rights to an adjudicatory hearing as required in 18 AAC 15.

## I. Permit Development Requirements

### Monitoring and Testing Requirements

Ambient air monitoring, emissions monitoring, and source testing, when necessary to assure compliance with emission regulations, New Source Performance Standards or meet the Prevention of Significant Deterioration (PSD) requirements, will be specified as conditions of the Permit to Operate for that facility. This section describes the requirements and conditions under which monitoring and testing will be specified in a permit.

The applicant may be required to establish and operate one or more ambient monitoring sites to predict and monitor the impact of the facility on ambient air quality, and install and operate continuous monitors to measure the concentration of pollutants in the exhaust stack or other parameters related to operation of an emissions control system. Source tests will usually be required to certify or verify compliance and may be required on a routine basis when continuous data is unavailable.

### Ambient Monitoring

In addition to possible pre-construction monitoring, the applicant may need to monitor meteorological parameters and ambient air quality during construction and for up to three years following startup. For facilities proposing to locate near an area listed in 18 AAC 50.021(c), monitoring of natural conditions and of any change in existing conditions may be required.

If the facility is projected to cause an impact greater than the levels listed in 18 AAC 50.510(b), ambient monitoring will be required to confirm the applicability of the modelling procedure. Normally, measurable impact will be considered to be 30% or more of an available increment or 5% or more of the air quality standard being exceeded.

The monitoring network may be revised, reduced or eliminated after evaluation of the data collected during the period following the startup of the new or modified facility. Instruments, siting, operation, calibration, and data reduction shall be in accordance with:

- U.S. EPA designated reference and equivalent methods and quality assurance requirements in 40 CFR 50, 40 CFR 53, and 40 CFR 58 (Appendices B and E)

- EPA - 450/4-80-012 November 1980, "Ambient Monitoring Guidelines for Prevention of Significant Deterioration"

- ADEC Air Quality Monitoring System Guidelines for Quality Control

- ADEC Procedures for Reporting Ambient Air Quality and Meterological Data

### Continuous Emissions Monitoring

The Department may require facilities under permit to monitor exhaust emissions or other parameters to determine compliance with New Source Performance Standards, other emission standards, or to determine the operating efficiency of control systems. The Department will specify the parameters to be monitored based on the source category, pollutant control system, ambient air quality, applicability or usefulness of the data, and pertinent regulations. The parameters are listed below in three groups - exhaust characteristics, process parameters and others. Examples of monitoring requirements for specific source categories are given with the conditions to be considered in determining which requirements are applicable.

A facility under permit may be required to install, calibrate, maintain and operate one or more continuous monitoring instruments in the exhaust stack(s). The parameters for which the department will require monitors will be specified in the permit. Examples include:

- opacity (transmissivity)
- sulfur dioxide
- nitrogen oxides ($NO/NO_2$)
- oxygen
- carbon dioxide
- temperature
- flow rate

A facility under permit may be required to install, calibrate, maintain and operate one or more continuous or totalizing instruments to measure control system or process parameters related to air contaminant emissions. The paramenters for which the department will require measurements will be specified in the permit. Examples include:

- fuel flow (volumetric or weight)
- chemical flow
- pH
- production rate
- pressure drop
- water pressure
- voltage
- frequency (of precipitator discharge, baghouse pulsing, or salient feature of other cyclical control devices)

A facility under permit may be required to periodically measure or test fuels or chemicals burned, sorted or transferred. Examples include:

- solids content
- moisture content
- sulfur content
- ash content
- volume in storage vessel
- temperature of storage vessel
- throughput

Monitoring equipment specification and calibration, testing procedures and data reporting and reduction shall be in accordance with 40 CFR 60 Appendix B, Performance Specifications 1 (opacity), 2 ($SO_2$, $NO_x$) and 3 ($CO_2$, $O_2$), and air quality control permit to operate requirements. ASTM, TAPPI, API or other appropriate national industrial testing methods may be used if approved by the department.

The criteria for determining the type of monitoring instrument include the source category, pollutant control system and ambient air quality. Examples of instrumentation which may be required for particular source categories are listed below. These include the applicable monitoring requirements specified in 40 CFR 60 (NSPS).

° Opacity (transmissivity)

  - Coal or wood-fired boilers of any size if a control system has been installed to comply with opacity or particulate matter emission regulations.

- Oil-fired or chemical-fired boilers, rated at or greater than 150mm BTU/hr or of any size if a control system has been installed to comply with opacity or particulate matter emission rate regulations.

- Incinerators rated at more than 2000 lb/hr; silo burners or air curtain incinerators will be excluded from this requirement.

- Oil-fired turbines or engines if the source has been cited in violations of visible emissions regulations in separate incidences over one year.

- Fluid catalytic cracking unit catalyst regenerator.

- Portland cement plant clinker cooler of kiln or a coal treating facility thermaldrier or pneumatic coal cleaner which has a particulate matter control system installed.

° Sulfur Dioxide

- Coal-, oil- or chemical-fired boilers, turbines or engines of any size if the sulfur content of the fuel will exceed 0.7%.

- Coal-, oil- or chemical-fired boilers of 100mm BTU/hr or greater if a control system will be installed to comply with $SO_2$ emission regulations.

- Process gas-fired heaters of any size if the fuel will contain more than 230 mg/scm $H_2S$.

The applicant may propose alternate monitoring schemes for approval, such as determining the sulfur content of the fuel or measurement of those parameters which control the sulfur dioxide emissions.

° Nitrogen Oxides

- Any facility with a total rated capacity of boilers, turbines and/or engines exceeds 4000mm BTU/hr must monitor $NO/NO_2$ if the ambient level of $NO_2$ in the airshed is greater than 50% of ambient standards.

- Any boiler, turbine or engine rated at 200mm BTU/hr or greater will be required to monitor $NO/NO_2$ emissions if source tests show emission rates are greater than 70% of applicable emission standards, or ambient levels of $NO_2$ in the airshed are greater than 50% of ambient standards.

° Oxygen, Carbon Dioxide, Temperature, Flow Rate

The department may require the owner/operator to monitor these parameters, to assure proper operation of the facility.

° Other Parameters

- The owner/operator of an incinerator must measure the quantity and type of wastes burned and quantity of auxiliary fuel burned in the incinerator and control system.

- The owner/operator of a fuel-burning facility must measure the quantity of fuel burned and may be required to test the sulfur, ash and moisture content of the fuel.

- The owner/operator of a refinery, crude oil or petroleum product storage and/or transfer facility may be required to measure storage temperature, tank level and throughput.

- The owner/operator of a facility which installs a particulate matter or sulfur dioxide control device to comply with regulations may be required to monitor operating parameters such as:

  Baghouse --pressure drop, pulse rate, exhaust temperature;
  Scrubber --water flow, water pressure, pressure drop, pH, exhaust temperature;
  Precipitator --voltage, discharge rate, water pressure, exhaust temperature;
  Mechanical Collectors (multiclones, mist eliminators, etc.) --pressure drop.

Source Testing

The department will require a new or modified source or control system subject to NSPS or any other source deemed necessary be tested within the 90 days following startup to certify compliance. Additional time may be granted to optimize operation of the facility and/or its control system, but testing should be done within 180 operating days after startup.

Alternate testing or monitoring methods may be proposed by the owner or operator. The department will reduce costly testing, monitoring, or record keeping procedures which are not necessary to assure compliance with applicable emission limitations. However, EPA must approve alternative testing or monitoring programs recommended by the department. Alternatives such as determining the sulfur content of fuels, testing one of a group of similar sources and process monitoring instead of emission monitoring are types of alternatives which may be evaluated.

The department may require source tests on a routine basis or upon notification if necessary to monitor or confirm compliance with allowable emission rates during a compliance program, special evaluation or change in operating procedures, in lieu of continuous monitoring, or when the source has been observed in violation of, or is suspected of being in violation of applicable regulations. The department, with consent of permittee, may conduct source tests to confirm compliance, determine emission rates, or for educational/instructional purposes.

Source tests will be performed in accordance with 40 CFR 60 Appendix A, Reference Methods 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, and 20 amended as of November 1, 1983.

### 3. Prevention of Significant Deterioration

Basis of Program

In August 1977, the U.S. Congress passed amendments to the Clean Air Act. A major feature of these amendments were the requirements to prevent deterioration of ambient air quality, particularly in areas such as the majority of Alaska where the air is much cleaner than the Ambient Air Quality Standards. The Prevention of Significant Deterioration (PSD) requirements establish allowable incremental changes in air quality which may not be exceeded by industrialization and urbanization. In a PSD application, the owner/ operator of a major new or modified facility must determine the existing air quality and calculate the changes in air quality caused by other facilities constructed after January 1975 and/or growth in the area occurring after the baseline date triggered by the first complete PSD permit application in the area impacted by the proposed facility. The PSD applicant must also calculate the changes in air quality which will occur from operation of the proposed facility.

Also needed is an analysis of air quality standards and PSD increment consumption whenever a state relaxation of emission requirements for an existing or permitted facility results in an actual increase in emissions. If the relaxation of an emission standard or a limitation on the operation of one or more sources at a facility installed after August 7, 1980, leads to an increase in allowable emissions, a PSD applicability determination will be made. If the analysis affirms PSD regulations apply, the owner or operator of the facility must prepare a complete PSD analysis for the affected portion(s) of the facility.

The PSD requirements are of importance to Alaska because all new major industrial or power generating facilities must obtain a PSD permit before commencing construction. A project cannot be approved until the applicant has demonstrated the PSD increment will not be violated, and all of the procedural requirements have been satisfied.

The Department will assist the applicant as much as possible to minimize the applicant costs and the time required to review an application. Frequent consultation between the applicant and the Department will ensure an acceptable monitoring program is developed to provide sufficient data. The Department will notify the applicant of the information to be included in an application at the earliest possible time. Discussions of the various aspects of the project while the application is being prepared will help avoid undue delays during final review.

PSD Regulations

The relationship between the regulation revisions and the PSD Program is outlined below.

- Ambient air quality increments and standards which are not to be exceeded by a project or series of projects; 18 AAC 50.020

- Identification of nonattainment areas, Class I areas, Class II areas, Class III areas, and areas protected from visibility degradation; 18 AAC 50.021(a), (b), and (c)

Procedures for reclassifying areas and limitations on reclassifications;
18 AAC 50.600

An owner/operator of specified facilities must apply for and obtain written approval from the Department prior to construction and modification;
18 AAC 50.300

Limitations on the use of stack height and dispersion techniques;
18 AAC 50.530

The owner/operator of a proposed or modified PSD facility to provide data so the Department can determine whether Best Available Control Technology (BACT) is being applied;
18 AAC 50.300(b)(4) and (c)(3)

The Department cannot grant a permit if PSD increments or ambient air quality standards are exceeded;
18 AAC 50.400(c)

The PSD applicant must demonstrate compliance with ambient air quality standards or increments using approved air quality models or their equivalent;
18 AAC 50.300(c)(2)

The Department cannot grant a permit if applicable regulations established under AS 46.03 are not met;
18 AAC 50.400(c)

The owner/operator of a proposed PSD facility must install and operate an ambient air monitoring network if required by the Department;
18 AAC 50.400(c)(1), 510, and 520

The owner/operator must submit a complete application including information necessary to determine compliance with regulations;
18 AAC 50.300

Regulations provide for public participation and describe public hearing procedures;
18 AAC 15.060
18 AAC 50.400

The owner/operator is required to comply with applicable requirements of law regardless of Department action or inaction by statute;
AS 46.03.160(g)

## PSD Analysis Procedure

The department will analyze the application, and request any additional information which may be required within thirty days after initial receipt of the PSD application.

Within thirty days after receipt of a PSD application and all required supporting information from the applicant, the department will make a preliminary determination whether construction should be approved or disapproved. Copies of this determination as well as the PSD application and other pertinent materials will be made available to the public through the appropriate regional office of the department. The public will also be notified they have thirty days to comment on the documents and the facility's air quality effect, and may request a public hearing, within the first fifteen days of the comment period Notification shall be in at least one newspaper of general circulation in the area affected by the facility's operation.

Copies of this public notice will be sent to the applicant, the EPA Regional Administrator, the EPA Alaskan Operations Office, and to the affected local, State and Federal agencies.

If the owner or operator uses a model not listed in OAQPS No. 1.2-080 or modifies an approved model to determine increment consumption or compliance with ambient air quality standards, the model or modification will be subject to public review as part of the public review process on the permit application. Approval of the model or modification must be obtained from the U.S.Environmental Protection Agency, Region X, which will be indicated in the department's final determination document.

If a public hearing is requested, notification of such and procedures during the hearing will be in accordance with procedures for holding a public hearing, 18 AAC 15, on file in the Lieutenant Governor's Office.

The public will have fifteen days after the public hearing to submit written comments to the department; at that time the application shall be deemed complete in accordance with the State regulation 18 AAC 15 and Alaska Statute 46.03.160. Within thirty days of this date, the department will make a final determination whether construction shall be approved or disapproved, and issue the permit or the reasons for denial. The facility will be notified in writing of the final decision and copies of this determination will be sent to all interested parties.

4. Nonattainment Area Review

Approval of the proposed facility will be granted if the requirements in 18 AAC 50.400(c)(1) and (c)(2) and the nonattainment requirements in 18 AAC 50.400(c)(4) are complied with.

All applicable regulations of Chapter 50 that relate to the specific facility locating in a nonattainment area are applicable to the facility. This could include the ambient air quality standards listed in 18 AAC 50.020, the approval needed to construct as required in 18 AAC 50.300 and the emission limits in 18 AAC 50.040, 050, 060, and 300.

Also, federal regulations require an analysis of air quality standards whenever a state relaxation of emission requirements for an existing or permitted facility results in an actual increase in emissions. If the relaxation of an emission standard or a limitation on the operation of one or more sources at a facility installed after August 7, 1980, leads to an increase in allowable emissions, a nonattainment determination will be made. If the regulations apply, the owner or operator of the facility must prepare a complete analysis of the affected portion(s) of the facility.

5. New Source Performance Standards

New Source Performance Standards (NSPS) are emission standards set for specific major stationary source categories to employ current control technology. Specific monitoring, testing and recordkeeping requirements are also included in these regulations.

The state will implement the delegated NSPS through the permit program described in the previous sections. Specific monitoring, testing, recordkeeping and reporting requirements will be included in each individual permit based on the federal requirements specified in 40 CFR 60. In carrying out this program, the State intends to insure these requirements are implemented in a rational manner in Alaska, and minimize the number of agencies to which owners/ operators of sources in Alaska are responsible.

NSPS have been promulgated by EPA for many categories of sources. The State of Alaska is responsible for administering NSPS requirements for

- Incinerators with a charging capacity greater than 50 tons per day
- Municipal wastewater treatment plant sludge incinerators serving communities greater than 10,000 persons
- Asphalt plants
- Petroleum refineries
- Coal preparation plants
- Portland cement plants

In addition, control determinations equal to but not more stringent than the control required by NSPS can occur in the PSD analysis on a can-by-case basis. This includes source types not delegated to the state. The applicable monitoring and testing requirements would most likely be included also.

The specific regulations which implement each aspect of the New Source Performance Standards program for these source categories are:

- Regulations limit emissions from stationary sources including certain New Source Performance Standards (NSPS) source categories;
  18 AAC 50.040, and 050

- Regulations require the owner/operator of facilities of certain sizes or categories submit information and obtain permits. The permit may include testing/monitoring requirements;
  18 AAC 50.300, 400, 500, 510, and 520

- Applicable source testing, monitoring and reporting requirements will be specified in the permit; 18 AAC 50.400 and 500

Continuous monitoring, testing and reporting requirements are listed in Section IV.G.1. The specific requirements for each source category are in 40 CFR 60, which will be used to determine the monitoring and reporting requirements.

Existing NSPS sources listed above fall under state NSPS regulation when modified or changed so to be subject to a new review under 40 CFR 60.

6. Visibility Review

The December 2, 1980, Federal Register presented regulations for protection of visibility in Class 1 areas and in specified areas viewed from a Class I area which have scenic value. Two areas identified by the federal land manager of Denali (Mount McKinley) National Park are Mount Deborah and the Alaska Range East, as viewed from approximately the Savage River River Campground area, and Mount McKinley, Alaska Range and the Interior Lowlands, as viewed from the vicinity of Wonder Lake.

The strategy for maintaining these areas and any Class I areas in the state is to require stringent review requirements for new or modified facilities that may affect one of the areas by

° Continuing discussion between the state and applicable federal land managers including early notification of federal land managers after first contact of applicants, transmittal of the complete application for a proposed facility within 30 days of receipt, and 60 days notification of public hearings on the proposed facility. The state will consider the federal land manager's comments and address them in the notice of public input;

° The permit applicant must submit an analysis of potential visibility impairment and background monitoring through the application procedures described in Section IV.G. Monitoring of existing natural conditions and monitoring of the change caused by proposed facility may required. Natural conditions include naturally occurring phenomena that reduce visibility in terms of visual range, contrast or coloration; and

° 18 AAC 50.300(c)(4) states visibility must be addressed by the applicant. 18 AAC 50.300(c)(3)(c) states "Approval (of the proposed project) will be granted only if the applicant shows that allowable emissions from the facility and from associated growth will not adversely affect air quality related values, including noise, odor, visibility, vegetation, and soils of any area within the state."

These values would be considered differently depending on the proposed location of the facility. Locating near a populated area may require a more stringent review of visibility values, for example. Impacting an area listed in 18 AAC 50.021(c)(3) would require an analysis of the adverse impact on visibility as defined in 40 CFR 51.301(a) while impacting an area listed in 18 AAC 50.021(c)(1) or (c)(2) would require an analysis of the adverse impact on visibility as defined in 40 CFR 51.307(c).

The federal strategies of emission reductions, compliance schedules, and source retirement to eliminate existing visibility degradation do not apply since no facilities have been identified that affect the areas listed in 18 AAC 50.021(c). Construction activity mitigation and smoke management will be handled on a case-by-case basis to minimize visibility degradation.

The long-term strategy for maintaining the existing visibility includes a rigorous analysis of any new or modified major facilities that may affect these area; a mutual agreement between the state and federal agencies involved in forest management in proper smoke control techniques, and an annual review as provided for in Section IV.A.1.

7. Sources Under EPA Review

New sources subject to NESHAPS requirements or federal NSPS not delegated to the state and not otherwise subject to permit requirements in 18 AAC 50.300 will be evaluated by ADEC for increment consumption and compliance with air quality standards. The evaluation will take into consideration the type and rate of emissions, emission control system efficiency, and impact on ambient air quality standards.

These sources will be evaluated by the EPA upon notice by ADEC the source may be subject to these regulations.

If the EPA-written determination whether the source is under their control has not been received by the state and a state permit needs to be issued, the cover letter of the permit will contain the following statement: "Your facility may also be subject to federal control. Please contact Mike Johnston, EPA Region X, 1200 W. Sixth Avenue, Seattle, WA 99801, for information."

EPA has also kept control of the permit process on Indian reservations, as that is not delegatable to the states.

## H. PERMIT ISSUANCE REQUIREMENTS

The purpose for issuing an air quality control permit is to assure a facility maintains compliance with applicable air quality regulations. Every effort will be made to eliminate permit requirements not necessary to achieve this purpose. All permits will include a brief description of the operation of the facility and several standard conditions. Occasionally a permit may require specific testing procedures, notification prior to intermittent operations, maintenance specifications or other unique conditions . An example of a standard permit is shown in Figure IV.H-1.

For projects subject to a BACT determination, the permit conditions will require reanalysis of control technology for each affected source at the facility if construction has not begun within eighteen months following issuance of the permit. In this instance, the concept "begun construction" includes entering into contractual obligations of off-site fabrication or onsite construction which cannot be cancelled or modified without substantial loss to the owner or operator of the facility.

Generally, a source subject to BACT or LAER determination will contain source-specific emission limitations in their permit.

As a condition of each permit, the department will specify requirements needed for periodic reporting of operating hours/days, fuel consumption, production rates, operating parameters, maintenance work, monitoring or test data, and equipment failures or operating conditions which affect air contaminant emissions. Additional test data or written reports of equipment failures may be submitted at any time at the discretion of permittee.

The data required to be reported will be specified in an attachment to the permit. A report is required even if a facility did not operate during the reporting period. An example of data to be reported for a relatively complex facility is shown in Figure IV.H-2. Specific reporting requirements will be established for each permitted facility. The listing below indicates applicable reporting requirements to be selected, and includes those specified in 40 CFR 60 (New Source Performance Standards).

- Operations; Hours or days per month or quarter each source or the facility was in operation including periods during which a new source was tested prior to actual productive startup.

- Production rate; Daily average per month or quarter; maximum/minimum day in each month or quarter; annual total.

- Fuel consumption; Type of fuel or waste burned; daily average and total quantity per month, quarter or year.

- Source tests; A summary report of required source tests including date, testing method and sampling train, fuel burning or operating rate, % isokinetic sampling concentration or emission rate and stack exhaust gas flow rate, temperature and water vapor content.

° Continuous stack monitoring;

- opacity (transmissivity) -- daily average in %;

- sulfur dioxide -- weekly average, maximum and minimum day in applicable units such as ppm, lb/mm Btu fuel burned, lb/day, lb/ton of product;

- particulate matter -- weekly average, maximum and minimum day in units such as lb/day, lb/ton product, lb/1000 lb coke burn-off;

- NO/NO2 -- weekly average in units such as ppm, lb/mm Btu fuel burned;

- O2/CO2 -- monthly average in terms of % excess air or actual concentration;

- temperature -- monthly average.

° Ambient monitoring;

- meteorological parameters, sulfur dioxide, nitric oxide, nitrogen dioxide and other gases - hourly averages for each monitor submitted on magnetic tape or disk in SAROAD format;

- particulate matter -- twenty-four hour sample of total concentration sampled every 2, 3 or 6 days; permittee may be required to analyze one or more samples per month for chemical or physical characteristics such as lead, urea, phosphate, sulfate, fluoride, or size distribution.

° Control system parameters; weekly averages of those parameters which describe the operation of the particular control system.

° Fuel quality monitoring; monthly average sulfur or H2S content of fuel based on continuous monitoring, weekly or monthly testing; sulfur content by shipment if delivered less frequently than once a month; monthly average moisture and ash content of coal, woodwaste, solid waste or sludge based on weekly testing.

° Petroleum storage; type(s), typical Reid vapor pressure(s), date(s) stored, throughput per month or quarter, average storage temperature based on daily or weekly measurement.

° Equipment failures or operating conditions which may affect air contaminant emissions;

- an initial report shall be submitted verbally or in writing to the appropriate regional office of the department within 5 working days, 24 hours or such other time period specified in the permit.

- a complete report describing the incident must be submitted with the routine periodic report and include:
  - i) date
  - ii) duration of incident
  - iii) nature of the occurrence
  - iv) equipment failures
  - v) steps taken to minimize emissions
  - vi) measures taken to avoid recurrence
  - vii) available monitoring data, type and quantity of emissions.

FIGURE IV.H-1
EXAMPLE STANDARD PERMIT

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONTROL
PERMIT TO OPERATE

Permit No. 8310-AA000 Date of Issue: February 1, 1983

The Department of Environmental Conservation, under authority of AS 46.03 and 18 AAC 50.400, issues an Air Quality Control Permit to Operate to

ABC COMPANY, INCORPORATED
1111 FIRST AVENUE
ANYWHERE, ALASKA 99000

For the operation of three oil-fired turbines and one incinerator as described in the ABC Company, Incorporated permit application and supplementary information transmitted by letters dated November 25, 1982, and December 15, 1982.

The facility is located at the Tongass Municipal Utility Plant, two miles northwest of Anywhere, Alaska

The following conditions shall apply:

1. Permittee shall comply with the Ambient Air Quality Standards and Increments set by 18 AAC 50.020, and the applicable emission standards set by emission standards set by 18 AAC 50.040 and 050.

2. Permittee shall dispose of residue from the incinerator only at a solid waste disposal site approved by the Department.

3. Air Contaminant Emission Reports as described in Exhibit A shall be submitted to Southcentral Regional Office of the Department by within 30 days after the end of each calendar quarter.

4. Permittee shall operate and maintain all fuel burning equipment to provide optimum fuel burning efficiency during all operating periods.

5. Representatives of the department, with permittee's approval, are allowed access to permittee's facilities to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit and State environmental laws and regulations.

6. A copy of this permit shall be clearly displayed and the State Air Quality Regulations 18 AAC 50 kept on file at the permitted facility location.

This permit expires 30 January 1988 and may be revoked or suspended in accordance with 18 AAC 50.310.

REGIONAL ENVIRONMENTAL SUPERVISOR
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE IV.H-2
EXAMPLE PERMIT ATTACHMENT

EXHIBIT A
AIR QUALITY CONTROL PERMIT TO OPERATE 8310-AA000
AIR CONTAMINANT EMISSION REPORT

An Air Contaminant Emission Report shall be submitted to the department quarterly by April 30, July 30, October 30 and January 30 each year. The report shall include, but not be limited to, the following information:

NAME OF FIRM
LOCATION OF FACILITIES
PERIOD OF REPORT

| | Quarterly total |
|---|---|
| 1. DAYS OPERATED | Number of plant days; hours or days for each unit if different from total plant |
| Process boiler | |
| Oil-fired boiler | |
| Incinerator | |
| Standby diesel generator | |
| 2. PRODUCTION | Tons product |
| Maximum day | |
| Minimum day | |
| Period average | |
| 3. FUEL CONSUMPTION | Indicate type of fuel consumed |
| Process boiler | Pounds chemical and average % solids |
| Oil-fired boiler | Barrels; indicate average sulfur content based on two or more analyses per quarter* |
| Incinerator | Pounds, waste, type |
| Auxiliary fuel | Gallons $X10^3$ |
| Standby diesel generator | Gallons $X10^3$ |

*Report any change in supplier or type of fuel oil.

4. EMISSIONS DATA, CHEMICAL BOILER

a. Sulfur oxides (continuous monitoring)

| | |
|---|---|
| Maximum day | 24-hour average lb $SO_2$/ton product |
| Minimum day | |
| Period average | |

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Exhibit A, Air Quality Control Permit to Operate 8310-AA000, (Continued)

| | Quarterly Total |
|---|---|
| b. Particulate matter | Summary results of 2 particulate matter source tests per month including: date, testing method and sampling train, firing rate of boiler, % isokinetic, concentration or emission rate, stack exhaust gas flow rate, stack temperature, and stack water vapor content |
| 5. EMISSIONS DATA, OIL BOILER | |
| a. Sulfur oxides (continuous monitoring) | Indicate date, average sulfur dioxide concentration and duration of any period during which the concentration exceeds 500 ppm for sixty minutes or more if monitor installed pursuant to 40 CFR 60.45(a) |
| b. Particulate matter (continuous monitoring) | Record weekly average opacity or transmissivity to nearest 5% if greater than 25%, if less than 25% indicate "25%" |

6. Additional source test data may be submitted at the discretion of permittee, if requested by the department, or to substantiate certification of compliance with applicable regulations.

| | |
|---|---|
| 7. AMBIENT AIR DATA | Hourly averages for each monitor.* Data may be submitted on magnetic tape or disk in SAROAD format. |
| a. Meteorological parameters | Continuous wind speed, wind direction and air temperature at 2 stations |
| b. Sulfur dioxide | Continuous concentration at 1 station |
| c. Particulate matter | Twenty-four hour sample of total concentration every six days at 1 station |

*Monitoring stations and parameters as described in the ABC Chemical Company letter dated January 29, 1973.

page 2 of 3

Exhibit A, Air Quality Control Permit to Operate 8310-AA000, Continued

8. Attach a detailed description of equipment failures or operating conditions which may have adversely affected air contaminant emissions. A preliminary report of the incident shall be submitted within five working days to the Regional Office of the department (111-1111) in Anywhere, Alaska. A separate report is required for each incident.

   Include such information as: date of incident, duration, nature of occurrence, equipment failures, steps taken to minimize emissions, measures taken to avoid recurrence, available emissions and ambient air data, and a general description of the weather.

9. Attach a brief discussion of any change in operations, stack monitoring equipment, testing procedures, air quality or meteorological equipment or locations which may affect reported results, or failure which may have have affected the results or resulted in incomplete or lack of data for any given day.

10. Signature of authorized agent preceded by the statement: "I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete and accurate."

11. Date of report.

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AMENDMENTS TO VOLUME II, SECTION IV
POINT SOURCE CONTROL PROGRAM
SUBPART I

"AIR QUALITY COMPLIANCE CERTIFICATION PROCEDURES
FOR
VOLATILE LIQUID STORAGE TANKS, DELIVERY TANKS,
AND LOADING RACKS"

Amended as of 12 / 10 / 92 .

SUBPART I

"AIR QUALITY COMPLIANCE CERTIFICATION PROCEDURES
FOR
VOLATILE LIQUID STORAGE TANKS, DELIVERY TANKS,
AND LOADING RACKS"

TABLE OF CONTENTS

## 3. PERMIT REVIEW and ISSUANCE PROCEDURES



## 4. PERFORMANCE TESTING and INSPECTION PROCEDURES

# 1. BACKGROUND

## a. INTRODUCTION

### i. PURPOSE OF THIS DOCUMENT

This document forms Section IV, Subpart I, of Volume II of the State Air Quality Control Plan and contains the information and procedures to implement 18 AAC 50.065 and 18 AAC 50.066.

In this document, the owner or operator of a volatile liquid storage tank or loading rack who is required to obtain a permit to operate under 18 AAC 50.300 is called the "applicant" or "permittee."

### ii. C.F.R. CITATIONS USED IN THIS DOCUMENT

This document cites the Code of Federal Regulations (C.F.R.) extensively. Citations of the C.F.R. in this document follow the numbering convention used in the C.F.R., and citations are presented in **bold, helvetica** type. All citations refer to the C.F.R. revised as of July 1, 1991.

The C.F.R. is a codification of the rules published in the Federal Register by agencies of the federal government. This document footnotes each C.F.R. citation with the volume number, page number, and date the rule was published in the Federal Register.

### iii. EPA TEST METHODS

All EPA test methods cited in this document are contained in Appendix A to Part 60, Title 40 of the Code of Federal Regulations, revised as of July 1, 1991. **[40 C.F.R. 60, Appendix A]**.

## b. BOUNDARIES OF PORT OF ANCHORAGE

For the purposes of 18 AAC 50, the Port of Anchorage is defined as the area bordered

- on the west by Knik Arm;
- on the north by the latitude of the northern terminus of Tidewater Road as of January 1, 1992;
- on the east by the longitude of the northwest corner of the Government Hill Elementary School building; and
- on the south by Ship Creek.

## c. DEFINITION OF A VOLATILE LIQUID

The requirements of 18 AAC 50.065 and 18 AAC 50.066 apply to storage tanks, loading racks, and delivery tanks that contain or load volatile liquids. A "volatile liquid" is defined as any liquid compound or mixture of compounds that exerts a maximum true vapor pressure of 0.5 pounds per square inch or greater.

### i. SUBSTANCES PRESUMED TO BE VOLATILE LIQUIDS

The following common substances are presumed to be volatile liquids unless the maximum true vapor pressure is shown to be less than 0.5 pounds per square inch by the methods described in 1.c.iv of this subpart:

- Automotive gasoline
- Aviation gasoline
- Jet B, JP–4, Jet Naphtha, and equivalents
- Methyl tertiary-Butyl Ether (MTBE)[a]
- Ethanol
- Naphtha

[a] *Methyl tertiary–Butyl Ether (MTBE) has a vapor pressure of 3.2 pounds per square inch at 59°F.*

### ii. SUBSTANCES PRESUMED NOT TO BE VOLATILE LIQUIDS

The following common substances are presumed not to be volatile liquids:

- Diesel fuels DF-1 and DF-2
- #2, #6 Fuel Oil, Bunker Oil
- Jet A, JP-5, Jet Kerosene, and equivalents
- Asphalt oil

The department will, in its discretion, require an applicant who stores or loads substances on this list to confirm that the substance exerts a maximum true vapor pressure less than 0.5 pounds per square inch using the procedure in 1.c.iv of this subpart.

### iii. SUBSTANCES NOT LISTED IN THE PREVIOUS TWO SECTIONS

If a substance is not listed in 1.c.i or ii of this subpart, the substance is rebuttably presumed to be a volatile liquid. To rebut this presumption, an applicant must demonstrate that a substance exerts a maximum true vapor pressure less than 0.5 pounds per square inch according to the methods specified in 1.c.iv of this subpart.

### iv. DETERMINATION OF MAXIMUM TRUE VAPOR PRESSURE

This portion of Subpart I specifies acceptable methods for determining the maximum true vapor pressure of a substance for the purposes of 18 AAC 50.065 and 18 AAC 50.066.

The maximum true vapor pressure is defined as the equilibrium partial pressure exerted by a liquid at the local maximum monthly average temperature reported by the National Weather Service. The local maximum monthly average temperature at the Port of Anchorage is **<u>58</u>**°F[b]; therefore, the maximum true vapor pressure must be determined at this temperature.

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[b] *58°F is the average temperature for Anchorage for the month of July.*

The maximum true vapor pressure must be determined by

- Methods described in American Petroleum Institute Bulletin 2517, Evaporation Loss From External Floating Roof Tanks, Second Edition, February 1980; or

- Methods described in AP-42, Compilation of Air Pollutant Emission Factors, Environmental Protection Agency, September 1985.

The department will, in its discretion, approve an alternative method for determining maximum true vapor pressure.

## d. HOW TO DETERMINE IF THE REGULATIONS APPLY

### i. VOLATILE LIQUID STORAGE TANK APPLICABILITY

A volatile liquid storage tank is any stationary storage tank that at any time holds a volatile liquid defined in 1.c of this subpart. The requirements of 18 AAC 50.065 apply to volatile liquid storage tanks in the Port of Anchorage that have a volume greater than or equal to specific size thresholds. The volume of a storage tank must be calculated by Equation (1).

$$\textit{Tank Volume} = \pi \times h \times \left(\frac{d}{2}\right)^2 \times 0.1781$$

*where:*

$$\begin{aligned} \textit{Tank Volume} &\equiv \textit{barrels} \\ \pi &= 3.1416 \\ h &= \textit{height of tank wall (ft.)} \\ &\quad \textit{(length for horizontal tanks)} \\ d &= \textit{inside diameter of tank (ft.)} \\ 0.1781 &= \textit{units conversion factor} \end{aligned}$$

**Equation (1):** Storage Tank Volume.

- If the tank volume calculated by Equation (1) $\geq$ 9000 barrels, 18 AAC 50.065(a) and (b) apply to the tank.
- If the tank volume calculated by Equation (1) $\geq$ 952 barrels but less than 9000 barrels, 18 AAC 50.065(c) applies to the tank.
- If the tank volume calculated by Equation (1) < 952 barrels, 18 AAC 50.065 does not apply to the tank.

## ii. VOLATILE LIQUID LOADING RACK APPLICABILITY

A volatile liquid loading rack is all equipment, piping, and fittings used to fill delivery tanks with a volatile liquid defined in 1.c of this subpart. The requirements of 18 AAC 50.066 apply to volatile liquid loading racks with a design throughput of 15 million gallons or more per year.

(1) An applicant may calculate design throughput by Equation (2)[c].

$$\textit{Design Throughput} = 0.5256 \times \sum_{i=1}^{n} Q_i$$

*where:*

*Design Throughput* ≡ *Millions of gallons per year.*
$n$ = *Number of arms loading volatile liquid that can be used simultaneously.*
$Q_i$ = *Design flow rate of liquid product through loading arm i, in gallons per minute.*
0.5256 = *units conversion factor.*

**Equation (2):** Loading Rack Design Throughput.

- If the design throughput calculated by Equation (2) ≥ 15 million gallons per year, 18 AAC 50.066 applies to the loading rack.
- If the design throughput calculated by Equation (2) < 15 million gallons per year, 18 AAC 50.066 does not apply to the loading rack.

[c] *Note: The applicant shall demonstrate that any volatile liquid loading arms excluded from Equation (2) are physically unable to load.*

(2) An applicant may propose an alternative equation.

An applicant may propose an alternative equation to account for physical limitations that are not represented by Equation (2). The department will, in its discretion, approve this alternative equation if the applicant adequately demonstrates that the alternative equation represents the maximum amount of volatile liquid that a loading rack is physically capable of loading into delivery tanks.

- If the design throughput calculated by the alternative equation ≥ 15 million gallons per year, 18 AAC 50.066 applies to the loading rack.
- If the design throughput calculated by the alternative equation < 15 million gallons per year, 18 AAC 50.066 does not apply to the loading rack.

(3) An applicant may limit actual volatile liquid throughput to less than 15 million gallons per year.

An applicant may request the department to approve physical or operational restrictions to limit actual volatile liquid throughput to less than 15 million gallons per year. The department will only approve restrictions which are both effective and enforceable.

- If the department approves the proposed restrictions, the loading rack is exempt from the requirements of 18 AAC 50.066. The applicant is still required to obtain an air quality permit under 18 AAC 50.300(a)(8). The department will establish physical or operational limits in the permit as provided by 18 AAC 50.400(d)(4).
- If the department disapproves the proposed restrictions, the applicant shall determine applicability by the methods specified in 1.d.ii.(1) or (2) of this subpart.

## 2. PERMIT APPLICATIONS

A permit application must include the information required under 18 AAC 50.300(b)(1)--(4). Standard procedures are presented in Section IV.F.2 of the State Air Quality Control Plan. In addition, a permit application for volatile liquid storage tanks or loading racks must include the following information:

### a. GENERAL REQUIREMENTS

#### i. REQUIREMENTS FOR FLARES

A flare used as the control device for a volatile liquid storage tank or loading rack must meet the requirements of **40 C.F.R. 60.18**[d]. The applicant shall include, in the permit application submitted under 18 AAC 50.300, all information necessary to demonstrate compliance with **40 C.F.R. 60.18**[d].

#### ii. REQUIREMENTS FOR ALTERNATIVE CONTROL SYSTEMS

A facility owner or operator may satisfy certain requirements of 18 AAC 50.065 and/or 18 AAC 50.066 by operating an alternative control system. The applicant shall demonstrate to the department that the alternative system reduces the organic vapor emissions to the same level which would be achieved by the specific control systems listed in 18 AAC 50.065(a)(2), 18 AAC 50.065(a)(3), and/or 18 AAC 50.066(a)(1)(D)(i).

An applicant proposing to use an alternative control device shall submit the following as part of the permit application:

- The results of emission tests demonstrating the effectiveness of the alternative control device. The tests must accurately measure all Volatile Organic Compound (VOC) emissions from the control device and must account for variables affecting emissions—such as wind, temperature, and pressure.
- An engineering evaluation that shows that the alternative device will control emissions at the Port of Anchorage as effectively as the control devices listed in 18 AAC 50.065(a)(2), 18 AAC 50.065(a)(3) and/or 18 AAC 50.066(a)(1)(D)(i).

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[d] *51 Fed. Reg. 2701 (Jan. 21, 1986).*

## b. STORAGE TANKS

### i. ALL TANKS

Applications for permits required under 18 AAC 50.065 and 18 AAC 50.300 must identify each volatile liquid storage tank with a tank volume of 952 barrels or larger. The tank volume must be calculated by Equation (1) of section 1.d.i of this subpart.

The application must identify all control equipment in sufficient detail to determine whether it meets requirements of 18 AAC 50.065.

The application must include the following information:

- tank number;
- tank diameter;
- tank height;
- descriptions of any emission control equipment, as specified in 2.a.ii or 2.b.ii -- iv of this subpart;
- product stored;
- most recent yearly product throughput; and
- product descriptions.

A sample form for product description is shown in Figure IV.I.2-1.

If the most recent year's data for product throughput is different from current and expected future throughput, the applicant shall submit the most representative data available.

INFORMATION PERTINENT TO **EACH** VOLATILE LIQUID

*Please submit a copy for __each__ volatile liquid kept in the storage tanks.*

a. Product name:

b. Common name (if applicable):

c. Tank numbers where product is stored:

d. Product volatility (RVP). Designate by season (provide approximate dates), if applicable.

Season (month - month) RVP (psi)

e. Slope of the ASTM distillation curve at 10 percent evaporated, if known. The slope (S) is calculated according to the following equation:

S = (°F at 15 percent - °F at 5 percent)/10

S = ______________

f. Molecular weight of the vapor (lb/lb-mole) at 60°F, if known.

g. Average organic liquid density (lb/gal), if known.

h. The weight percentage and molecular weight of each compound in the stored liquid.

**Figure IV.I.2-1** Product Description Form.

### ii. Internal floating roof tanks

For volatile liquid storage tanks with internal floating roofs, an applicant shall include a description of each internal floating roof. This description must include the following information:

- type of roof (welded or bolted);
- types of all seals and fittings;
- date of roof installation; and
- dates of any upgrades in seals or fittings.

Sample forms are shown in Figure IV.I.2-2.

Some of this information was previously submitted to the department's Air Quality Management Section. Rather than resubmitting this information, an applicant may reference information that has already been submitted and is on file with the department, and that is still representative.

### iii. Tanks with closed vent/control device systems

The applicant shall submit an operating plan as part of the permit application required under 18 AAC 050.300. This plan must meet the requirements specified in 40 C.F.R. 60.113b(c)(1)(i) and (ii)[e]. As specified in the C.F.R., the plan must include

- description and drawings of the system design;
- parameters to be monitored;
- efficiency determination; and
- design specifications as described in 3.b.iii.(2) of this subpart.

The applicant shall provide a description of the storage tank vapor collection system as specified for loading rack collection systems in 2.c.ii of this subpart.

An applicant using a carbon adsorption control device shall submit information which demonstrates that the vapor to carbon mass ratios of the system can achieve 95 percent emission control at Anchorage temperatures. If sufficient information to demonstrate 95 percent emission reduction cannot be provided, the permittee shall demonstrate compliance by conducting a performance test at maximum operating capacity.

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[e] *52 Fed. Reg. 11,429 (Apr. 8, 1987), as amended at 54 Fed. Reg. 32,973 (Aug. 11, 1989).*

INFORMATION PERTINENT TO **INTERNAL FLOATING ROOF TANKS**
*Fill out if applicable. Please submit a copy for __each__ tank.*

a. Designated number used to reference this specific tank.

b. Year tank installed:

c. Year tank installed:

d. Tank construction (welded or riveted):

e. Basic dimensions of tank.

Diameter (ft): Height (ft):

f. Vent design for internal roof (freely vented or pressure-vacuum vent?):

g. Vent height, dimensions, and relative location:

h. Number and type of roof seals. Check or circle applicable answer.

Liquid mounted resilient seal
- primary seal only ________
- with rim mounted secondary seal ________

Vapor mounted resilient seal
- primary seal only ________
- with rim mounted secondary seal ________

Other (state) ____________________

i. Roof seal condition (good or poor?):

**Figure IV.I.2-2** Internal Floating Roof Tank Description Forms

j. Type and number of each deck fitting, if known. (Support columns are addressed in question l).

| | Number |
|---|---|
| Access hatch | |
| Bolted cover, gasketed | ______ |
| Unbolted cover, gasketed | ______ |
| Unbolted cover, ungasketed | ______ |
| Automatic gauge float well | |
| Bolted cover, gasketed | ______ |
| Unbolted cover, gasketed | ______ |
| Unbolted cover, ungasketed | ______ |
| Column well | |
| Built-up column-sliding cover, gasketed | ______ |
| Built-up column-sliding cover, ungasketed | ______ |
| Pipe column-flexible fabric sleeve seal | ______ |
| Pipe column-sliding cover, gasketed | ______ |
| Pipe column-sliding cover, ungasketed | ______ |
| Ladder well | |
| Sliding cover, gasketed | ______ |
| Sliding cover, ungasketed | ______ |
| Roof leg or hanger well | |
| Adjustable | ______ |
| Fixed | ______ |
| Sample pipe or well | |
| Slotted pipe-sliding cover, gasketed | ______ |
| Slotted pipe-sliding cover, ungasketed | ______ |
| Sample well-slit fabric seal, 10 percent open area | ______ |
| Stub drain, 1-inch diameter | ______ |
| Vacuum breaker | |
| Weighted mechanical actuation, gasketed | ______ |
| Weighted mechanical actuation, ungasketed | ______ |

Other ______________________________

**Figure IV.I.2-2 (Continued)** Internal Floating Roof Tank Description Form.

k. Floating roof deck construction - welded or bolted? If bolted, typical dimensions of panels or sheets used to construct the roof, if known.

l. Inside condition of tank (light rust, dense rust, gunite lined):

m. Number of columns supporting roof, if known:

n. Column construction (e.g., built-up or pipe) and dimensions, if known.

Type: __________

Dimensions:__________

o. Tank capacity (gal):__________

p. Content (type of product stored in tank):

q. Throughput (gal) for each month of 1990:

January __________
February __________
March __________
April __________
May __________
June __________
July __________
August __________
September __________
October __________
November __________
December __________

**Figure IV.I.2.-2 (Continued)** Internal Floating Roof Tank Description Form

### iv. CONSERVATION VENTS

A conservation vent contains a valve that opens only

- when the gauge pressure in the tank is greater than some maximum (positive gauge pressure); and
- when the gauge pressure in the tank is less than some minimum (negative gauge pressure).

By remaining closed at gauge pressures between this minimum and maximum, the conservation vent reduces or eliminates the movement of gasses in and out of the tank that would normally occur due to daily changes in temperature and atmospheric pressure. Without a conservation vent, this normal movement of gasses in and out of a storage tank results in organic vapor emissions ("breathing losses"), but with a conservation vent the reduced movement of gasses results in reduced organic vapor emissions. A conservation vent can not reduce the emissions resulting from tank loading or from truck or rail car loading (storage tank draining).

18 AAC 050.065(c) requires conservation vents for fixed roof volatile liquid storage tanks with a volume greater than or equal to 952 barrels (40,000 gallons) and smaller than 9,000 barrels (378,000 gallons). This requirement only applies to tanks located in the Port of Anchorage that do not have other emission control systems such as floating roofs or closed vents and control devices. The requirement shall only apply to tanks designed to withstand the maximum and minimum internal gauge pressures at which the conservation vent opens.

An applicant shall include the following documentation, if known, for each tank to which the requirements 18 AAC 050.065(c) would apply:

- tank number;
- the maximum and minimum internal gauge pressures that each tank is designed to withstand; and
- the routine maximum and minimum internal gauge pressures that each tank could safely withstand.

## c. LOADING RACKS

Permit applications for volatile liquid loading racks must contain

- A description of the volatile liquid loading rack;
- A description of the vapor collection system; and
- A description of the vapor processing system.

### i. HOW TO DESCRIBE THE VOLATILE LIQUID LOADING RACK

To describe the volatile liquid loading rack, the applicant shall provide:

(1) a sketch or schematic of the volatile liquid loading rack that identifies each delivery tank loading position and the products loaded at each position;

(2) a table for each loading position that:
- lists the product loaded through each loading arm;
- lists the maximum load rate through each loading arm;
- lists whether the arm top or bottom loads; and
- lists any physical restrictions on loading.

(3) the maximum annual volatile liquid throughput. See 1.d.ii in this subpart for how to calculate throughput. If an alternative equation is used, the applicant shall provide information supporting the use of the alternative equation.

(4) If any volatile liquid loading arms will use top loading, the length of the loading arm and the maximum and minimum depth of delivery tanks loaded at the rack.

(5) any other physical or operational restrictions that the applicant wants the department to consider when reviewing the application.

### ii. HOW TO DESCRIBE THE VAPOR COLLECTION SYSTEM

The applicant shall provide a general description of the vapor collection system, including a flow diagram for the collected vapors and the estimated flow rate of displaced vapors. This description must also include

(1) A demonstration of adequate vapor collection. An applicant shall show that vapor collection equipment will be installed at each loading position where a vapor laden delivery tank may be loaded and that the vapor collection equipment contains devices that prevent the flow of vapor from one delivery tank loading position to another.

(2) Information on each pressure relief valve in the vapor collection system. An applicant shall identify each pressure relief valve contained in the system and the pressure at which that valve is designed to open.

(3) An estimate of the gauge pressure at the point where a delivery tank will be connected to the vapor collection system.

### iii. HOW TO DESCRIBE THE VAPOR PROCESSING SYSTEM

The information required to describe the vapor processing system depends on the type of vapor processing performed.

(1) For systems using a vapor control device, an applicant shall provide manufacturers' guarantees, equipment data, and operating specifications. This data must demonstrate that the device is capable of meeting the emission limitation contained in 18 AAC 50.066.

(2) For systems using vapor balancing, an applicant shall provide the system information described in 2.b.iii of this subpart.

(3) For systems using an alternative method of vapor processing, an applicant shall provide the system information described in section 2.a.ii of this subpart.

# 3. PERMIT REVIEW and ISSUANCE PROCEDURES

The department will use the procedures in this section to review a permit application and develop an air quality permit. The "reviewer", as used in this section, means any and all department employees responsible for reviewing the permit application, approving or disapproving the application, or writing the permit or letter of disapproval. A reviewer

- determines if the application contains sufficient information;
- confirms that 18 AAC 50.065 and/or 18 AAC 50.066 applies to this source;
- determines if the control system designs and/or floating roof designs meet the requirements of the regulations;
- approves or disapproves the application; and
- writes the permit, including permit conditions, or letter of disapproval.

## a. INFORMATION REQUIRED TO REVIEW AN APPLICATION

In general, to begin a completeness review, a permit application must contain the following information:

- Information required under 18 AAC 50.300(b);
- Information required in section 2 of this subpart; and
- the application form shown in Figure IV.F.2-1.

If the permit application does not contain sufficient information, the reviewer must request additional information from the applicant. The reviewer must use technical judgment as to whether submitted information is sufficiently accurate.

## b. REVIEWING A PERMIT APPLICATION FOR STORAGE TANKS

### i. HOW TO CONFIRM THAT 18 AAC 50.065 IS APPLICABLE TO A STORAGE TANK

The owner or operator of any volatile liquid storage tank with a volume of 9,000 barrels (378,000 gallons) or greater located at the Port of Anchorage is required by 18 AAC 50.065 to control organic vapor emissions from the tank by using an internal floating roof, a closed vent/control device system, or an alternative emission control system. Criteria are presented in 1.c of this subpart to determine if a stored product is a volatile liquid, and tank volume is determined by Equation (1) in 1.d.i of this subpart.

Any volatile liquid storage tank with a volume between 952 and 9,000 that does not have an internal floating roof, a closed vent/control device system, or an alternative emission control system, and for which information is available on the pressure capability of the tank, may be required by 18 AAC 50.065(c) to have a conservation vent. If sufficient information is not available to determine the ability of a tank to withstand differences in pressure between the vapor space and the outside air, a conservation vent will not be required.

### ii. HOW TO DETERMINE IF AN INTERNAL FLOATING ROOF MEETS REQUIREMENTS OF 18 AAC 50.065

(1) Internal Floating Roofs Installed On or After June 1, 1992

Internal floating roofs installed on volatile liquid storage tanks on or after June 1, 1992 must conform to the technical requirements of **40 C.F.R. 60.112b(a)(1)**[f] when a permit is issued. If the floating roof was, or will be, installed on or after June 1, 1992, the reviewer must confirm that the data submitted by the applicant indicate that all seals and fittings conform to these technical requirements before a permit may be issued.

(2) Internal Floating Roofs Installed Before June 1, 1992

If an internal floating roof was installed before June 1, 1992, the reviewer must examine the most recent floating roof specifications submitted by the applicant for each storage tank. The applicant shall include updated information with his/her application and/or incorporate by reference in his/her application information submitted to the department in 1991.

(a) If a tank was emptied and degassed between the effective date of 18 AAC 50.065, and the date the initial permit is issued, all seals and fittings must conform to the technical requirements of **40 C.F.R. 60.112b(a)(1)**[f].

(b) For other tanks, the seals and fittings must be upgraded to meet the requirements **of 40 C.F.R. 60.112b(a)(1)**[f] the next time the operator empties and degasses the tank for any reason, such as emptying and degassing to comply with 18 AAC 75.065.

The department's Spill Prevention Planning and Management Office administers 18 AAC 75.065.

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[f] *52 Fed. Reg. 11,429 (Apr. 8, 1987).*

### iii. HOW TO DETERMINE IF A CLOSED VENT/CONTROL DEVICE SYSTEM MEETS REQUIREMENTS OF 18 AAC 50.065

For a closed vent/control device system, the department shall evaluate the operating plan submitted with the permit application to determine if provisions of 18 AAC 50.065 will be met. Before a permit can be issued, the reviewer must confirm that the system will meet the following criteria:

(1) Collection System

Any closed vent system that routes vapors to a control device must be capable of being operated with no detectable leaks, as specified in 4.a.ii.(1)(a) of this subpart.

(2) Control Device

(a) Incinerator

If the control device is an enclosed incineration device, a minimum residence time of 0.75 seconds and a minimum temperature of 816°C are sufficient to demonstrate 95 percent emission reduction.

(b) Flare

If the control device is a flare, then the department considers compliance with the provisions of **40 C.F.R. 60.18**[g] sufficient to demonstrate 95 percent emission reduction.

(c) Carbon Adsorber

If the control device is a carbon adsorption system, the manufacturer's specifications including carbon to vapor ratio must demonstrate that the system is adequate for retaining 95 percent of the vapors during maximum load conditions at Anchorage temperatures. Maximum load should account for tank loading at the maximum loading rate, vapors introduced from any carbon bed being regenerated, and the maximum quantity of vapors from any loading racks that will be fed to the same carbon adsorbers.

The manufacturer's specifications of the control device must be evaluated to determine if the device is capable of handling the maximum flow rates of

[g] *51 Fed. Reg. 2701 (Jan. 21, 1986).*

the vapor collection system and if the proposed timing for switching carbon beds will prevent breakthrough.

If the department determines that insufficient information is presented to demonstrate that the 95 percent requirement will be met, then the permit shall stipulate that a performance test be conducted. Performance testing is discussed in 4.a.ii.(2) of this subpart.

### iv. HOW TO REVIEW A PERMIT APPLICATION FOR A STORAGE TANK ALTERNATIVE CONTROL SYSTEMS

(1) How to Determine Equivalence of Emission Reductions

If the permittee chooses to control emissions with a system other than those specified in 18 AAC 50.065(a)(2) or (3), the department shall determine whether the applicant has demonstrated the equivalence of the alternative control device. As a basis for comparison, the department shall estimate emission reductions that would be achieved by a closed vent/control device system and by an internal floating roof.

(a) For a floating roof complying with 18 AAC 50.065(a)(2), the department shall estimate emissions using the methods presented in the department document, "Assessment and Control of Volatile Organic Compound Emissions from the Port of Anchorage Tank Farms," March 25, 1992, a copy of which may be reviewed at the central or southcentral regional office of the department.

(b) A value of 95 percent shall be used as an estimated control efficiency for a closed vent/control device system specified in 18 AAC 50.065 (a)(3).

(c) The reviewer shall evaluate information described in 2.a.ii of this subpart. The alternative emission control system must be no less effective than the least effective of the internal floating roof or closed vent/control device systems.

(2) Issuing a Permit

If the department determines that the alternative method provides equivalent emission reduction, it will provide public notice and opportunity for a public hearing before permit issuance. Any information provided through public testimony will be used in making the final decision to issue or deny the permit.

The department will, in its discretion, include any conditions in the permit that are necessary to ensure that emission reduction will be equivalent to that provided by complying with 18 AAC 50.065(a)(2) or (3).

### v. HOW TO EVALUATE THE USE OF CONSERVATION VENTS

The department may require conservation vents, by permit condition, **only for tanks shown to be capable of safely withstanding the maximum and minimum internal gauge pressures that will open a specified vent.** The maximum and minimum gauge pressure that the department may require a conservation vent to be capable of maintaining is **±0.8** psi. The department may require conservation vents capable of maintaining lesser pressure differences, if the applicant can demonstrate that such a vent will allow an adequate margin of safety.

## c. REVIEWING A PERMIT APPLICATION FOR LOADING RACKS

### i. HOW TO CONFIRM THAT 18 AAC 50.066 IS APPLICABLE TO THE LOADING RACK

The reviewer should use the description of the loading rack to determine the if 18 AAC 50.066 is applicable. Section 1.d.ii of this subpart contains three methods of determining applicability.

### ii. HOW TO DETERMINE IF THE LIQUID LOADING, VAPOR COLLECTION, AND VAPOR PROCESSING EQUIPMENT DESIGNS MEET THE REQUIREMENTS OF 18 AAC 50.066

(1) Evaluate the vapor collection system:

(a) Confirm that the rack loads liquid product either from the bottom of the delivery tank or from a submerged loading arm that extends to within six inches of the bottom of the delivery tank;

(b) Confirm that displaced vapors will be collected from each position where a vapor laden delivery tank will be loaded;

(c) Confirm that check valves or other equipment will be installed at each loading position to prevent the flow of vapors towards the delivery tank;

(d) Confirm that the gauge pressure in delivery tanks connected to the vapor collection system will not exceed 450 mm of water; and

(e) Confirm that each pressure relief valve in the vapor collection system is designed to open at a gauge pressure greater than 450 mm of water.

(2) Evaluate the vapor processing system:

(a) For vapor control devices, confirm that the manufacturer's guarantees and operating specifications indicate the system will limit emissions to $\leq$ 10 mg of organic compounds per liter of volatile liquid loaded.

(b) For vapor balance systems, confirm that vapors displaced by loading volatile liquid at the rack will be routed to the storage tank supplying the volatile liquid. An important consideration will be the effect of vapor balancing with a storage tank that is being loaded. The reviewer should confirm that the gauge pressure in the vapor collection system at the rack will never exceed 450 mm of water.

(3) Evaluate the methods an applicant proposes to ensure that each vapor laden delivery tank loaded at the rack had been certified vapor-tight. The applicant may use the procedures described in **40 C.F.R. 60.502(e)**[h], or the applicant may propose alternative procedures.

(4) Evaluate the methods an applicant proposes to ensure that vapor laden delivery tanks are connected to the vapor collection system while loading. An acceptable method is posting a notice of the requirement and instructing the operators on how to connect the vapor collection system.

### iii. HOW TO REVIEW A PERMIT APPLICATION FOR A LOADING RACK ALTERNATIVE CONTROL SYSTEMS

To review a permit application for loading rack alternative control systems, a reviewer will follow the procedure in 3.c.ii of this subpart. For alternative vapor control systems, the reviewer must confirm that the alternative system will be equivalent to using a vapor control device. An alternative system is equivalent if the emissions from that system will be $\leq$ 10 mg of organic compounds per liter of volatile liquid loaded.

[h] *48 Fed. Reg. 37,590 (Aug. 18, 1983); 48 Fed. Reg. 56,580 (Dec. 22, 1983), as amended at 54 Fed. Reg. 6678 (Feb. 14, 1989).*

## d. HOW TO DECIDE IF A PERMIT APPLICATION IS APPROVABLE

A permit application is approvable for the purposes of 18 AAC 50.400(c)(5) if the reviewer determines that the application meets the requirements of 18 AAC 50 as described above. If a permit application is not approvable, the reviewer should contact the applicant, explain any deficiencies, and request that the applicant provide additional information or modify the proposed vapor collection and/or vapor processing systems to meet the requirements of the regulations and this subpart. A permit application will be disapproved if the applicant and the department can not reach an agreement on an approvable permit application.

## e. HOW TO WRITE PERMIT CONDITIONS

The permit must contain all conditions necessary to ensure that the storage tank and/or loading rack vapor control will be built and operated as described in the approved permit application.

# 4. PERFORMANCE TESTING and INSPECTION PROCEDURES

This section presents the procedures a permittee must use to demonstrate compliance with 18 AAC 50.065 and 18 AAC 50.066.

18 AAC 50.520(d) states that "the department will, in its discretion, require the owner or operator of a volatile liquid storage tank, loading rack, or delivery tank subject to 18 AAC 50.065 or 18 AAC 50.066 to periodically inspect air pollution control equipment; repair any deficiencies detected; and report and keep records of all inspections and repairs as necessary to determine compliance with this chapter." This section lists the inspections the department deems necessary to determine compliance with 18 AAC 50.065 and 18 AAC 50.066.

**Unless otherwise stated, any period of time prescribed by this subpart refers to calendar days.**

## a. STORAGE TANKS

### i. INTERNAL FLOATING ROOFS

(1) Initial Inspection

(a) Timing

A permittee shall conduct an initial inspection of each internal floating roof installed to meet the requirements of 18 AAC 50.065. The inspection must be completed prior to filling the tank.

(b) Components to Be Inspected

The permittee shall visually inspect

- the internal floating roof;
- the primary seal; and
- the secondary seal (if one is in service) .

(c) Repair of Defects

Any hole, tear, or opening in a seal, or other defect in the internal floating roof must be repaired before the tank is filled.

(2) Annual Inspection

(a) Timing

The permittee shall conduct annual visual inspections no later than May 30 of each calendar year.

(b) Components to Be Inspected

The inspection must include

- the primary seal and the secondary seal, if there is one; and
- the floating roof.

These inspections can be made through manholes or hatches in the fixed roof.

(c) Defects

Any one or more of the following conditions are considered substantial defects:

- the internal floating roof is not resting on the surface of the liquid in the tank;
- there is accumulated liquid on the floating roof;
- the seal is detached;
- there are holes, tears, or openings in a primary seal.

The permittee shall repair any substantial defects or empty and remove the storage tank from service. This must be done as soon as possible, and in any event, no later than 45 days after the inspection. The department will, in its discretion, grant an extension upon written request by the permittee. The permittee's request for extension must document that alternative storage capacity is not available. It must also specify a schedule of actions the permittee will take to assure that the control equipment will be repaired or the tank will be emptied as soon as possible.

(3) Inspection Upon Emptying and Degassing

(a) Timing

The permittee shall conduct an inspection each time the storage tank is emptied and degassed. Inspections under this provision must be conducted no less often than once every 10 years, and can be scheduled to coincide with any emptying and degassing required under 18 AAC 75.065.

(b) Components to be Inspected

The permittee shall visually inspect

- the internal floating roof;
- the primary seal;
- the secondary seal (if one has been installed);
- gaskets;
- slotted membranes; and
- sleeve seals (if any).

(c) Defects

If

- the internal floating roof has defects;
- the primary seal has holes, tears, or other openings in the seal or the seal fabric;
- the gaskets no longer close off the liquid surface from the atmosphere; or
- the slotted membrane has more than 10 percent open area;

the permittee shall repair the problem or problems before refilling the tank.

ii. CLOSED VENT/CONTROL DEVICE SYSTEMS

(1) Leak Inspections

A closed vent/control device system can be used to comply with requirements of 18 AAC 50.065. The permittee shall maintain the system in a vapor-tight condition so that there are no detectable leaks as defined in 4.a.ii.(1)(a)(i) of this subpart.

(a) Initial Inspection

The permittee shall inspect the system within the first 60 days after a permit issuance and prior to each performance test. The initial inspection must determine if there are any detectable leaks.

(i) For the purposes of this provision, a detectable leak is defined as an instrument reading of greater than or equal to 500 ppm above background as measured using **EPA test method 21**[i] in accordance with **40 C.F.R. 60.485 (b)(1)**[j].

(ii) The permittee shall repair all leaks within 15 days of detection and before any performance test.

(b) Additional Leak Inspections

The department will, in its discretion, require the permittee to conduct additional leak inspections. The permittee may use portable instruments, sight, and/or smell to conduct such inspections.

(2) Performance Test

If the department determines that information submitted with the permit application is insufficient to demonstrate that the system will result in 95 percent emission reduction, then a performance test is required. (This requirement does not apply to systems using flares.)

(a) Timing

(i) The test must be conducted within the first 60 days after permit issuance. The permittee may request an extension of the deadline for the performance test. The request must substantiate that maximum load conditions will not occur within 60 days after permit issuance.

(ii) The performance test must be conducted immediately after determining that the closed vent system has no detectable leaks as defined in 4.a.ii.(1)(a)(i) of this subpart.

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[i] *40 C.F.R. 60, Appendix A, revised as of July 1, 1991.*

[j] *54 Fed. Reg. 6678 (Feb. 14, 1989), as amended at 54 Fed. Reg. 27,016 (June 27, 1989).*

(b) Test Plan Approval

(i) For any required performance test, the permittee shall submit a test plan, at least 30 days in advance of the test date.

(ii) The department will, in its discretion, approve or disapprove the test plan within 30 days of receipt.

(iii) The organic vapor mass flow rate at both the inlet and the outlet of the control device must be determined in accordance with an approved test plan.

(c) Test Plan Content

(i) The plan must demonstrate that test will represent the average or worst case loading conditions.

(ii) A system using a carbon adsorber must be tested according to procedures specified in **40 C.F.R. 60.503 (c)(4),(5), and (6)**[k] or other procedures approved by the department.

(iii) Percent control efficiency must be calculated as follows:

$$\textit{Percent control efficiency} = 100 - \left(100 \times \frac{M_{out}}{M_{in}}\right)$$

*where:*

$M_{in}$ = *Organic vapor mass flow rate into control device*
$M_{out}$ = *Organic vapor mass flow rate out of control device*
*(units must be consistent)*

(iv) If the closed vent/control device system also processes emissions from loading racks, the permittee shall demonstrate that gauge pressure in the vapor collection system at the loading racks does not exceed 450 mm water during delivery tank loading. The gauge pressure must be measured both when a storage tank is, and is not, being loaded. The method for testing the gauge pressure is discussed further in 4.b.iii of this subpart.

(v) The vapor collection system may be designed so that loading rack emissions from delivery tanks are routed back into the storage tanks they are being filled from (vapor balanced), rather than

[k] *54 Fed. Reg. 6678 (Feb. 14, 1989); 54 Fed. Reg. 21,344 (Feb. 14, 1989).*

being fed directly to a carbon adsorber or other control device. If vapor balancing is used, then determination of compliance with the milligram per liter loading rack emission standard will not be possible, because vapors from loading will be mixed with vapors from volatile liquid storage tanks. Compliance must instead be demonstrated by conducting a performance test, as follows:

1) The test must be conducted when delivery tanks and storage tanks are being loaded simultaneously;

2) The test must adhere to procedures for loading rack performance testing which are specified in **40 C.F.R. 60.503 (c)(1) and (2)**[1], or are otherwise approved by the department; and

3) The test must include at least two hours of simultaneous delivery tank and storage tank loading, and must demonstrate 95 percent emission reduction.

The department will, in its discretion, require additional performance testing before permit renewal.

(3) Monitoring

The permittee shall monitor parameters in accordance with the operating plan, as approved by the department and included in the permit.

[1] *54 Fed. Reg. 6678 (Feb. 14, 1989); 54 Fed. Reg. 21,344 (Feb. 14, 1989).*

## b. LOADING RACK VAPOR CONTROL

A permittee shall use the procedures in this section to demonstrate compliance with 18 AAC 50.066(a)(1)(D) and (E) and 18 AAC 50.066(a)(3). A permittee shall

- conduct an initial performance test on the vapor control device;
- monthly inspect the vapor collection system for leaks; and
- annually test the gauge pressure in the vapor collection system.

### i. CONDUCTING A CONTROL DEVICE PERFORMANCE TEST

A permittee shall demonstrate compliance with 18 AAC 50.066(a)(1)(D) and (E) and 18 AAC 50.066(a)(3) by conducting an **initial performance test** of the vapor control device. The department will, in its discretion, require the permittee to conduct additional performance tests to certify compliance with the applicable emission standards.

(1) Procedures for submitting and approving a test protocol

(a) The permittee shall submit a test protocol to the department at least 30 days prior to conducting the test.

(b) The department will review this protocol and either approve or disapprove the protocol within 30 days of receipt. The department will, in its discretion, state the reasons for disapproving any protocol and the improvements necessary to make the protocol approvable. If the department fails to approve or disapprove the protocol within 30 days of receipt, that protocol will be deemed approved if it adheres to the testing procedures stipulated in this subpart.

(c) The permittee shall arrange a test date and time that will allow a department representative to observe the test. The department will, in its discretion, approve the test date and time in a letter to the permittee.

(2) Test method

The permittee shall test the vapor collection system and control device using the procedures listed in **40 C.F.R. 60.503(b), (c), and (d)**[m] with the following modifications:

(a) Any reference to a mass emission limitation means the mass emission limitation contained in 18 AAC 50.066(a)(1)(D).

(b) Any reference to gasoline means

(i) automotive gasoline, if the loading rack loads gasoline; or

(ii) the volatile liquid fuel with the greatest vapor pressure that is loaded by the system being tested.

(c) Any reference to gasoline tank trucks means a vapor laden delivery tank.

(d) The owner or operator may exclude the methane and ethane content in the exhaust vent by any method (e.g., Method 18) approved by the administrator of the department's southcentral regional office.

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[m] *54 Fed. Reg. 6678 (Feb. 14, 1989); 54 Fed. Reg. 21,344 (Feb. 14, 1989).*

### ii. CONDUCTING A MONTHLY LEAK INSPECTION

The permittee shall inspect the vapor collection and liquid loading equipment monthly using the following procedures to show continuing compliance with 18 AAC 50.066(a)(3).

(1) The permittee shall inspect the vapor collection and liquid loading equipment while a delivery tank connected to the system is being loaded with volatile liquid.

(2) The permittee may use portable instruments, sight, and/or smell to conduct the inspection.

(3) The permittee shall repair any leaks detected within 15 days of detection.

(4) Leaks that are detected during the monthly inspection <u>and</u> repaired within 15 days of detection ARE NOT a violation of 18 AAC 50.066(a)(3).

(5) Leaks that are not detected during the monthly inspection (or leaks that were detected but not repaired within 15 days of detection) ARE a violation of 18 AAC 50.066(a)(3).

### iii. TESTING THE GAUGE PRESSURE IN THE VAPOR COLLECTION SYSTEM

To determine compliance with 18 AAC 50.066(a)(1)(E), the permittee shall annually test the vapor collection system according to the following procedures:

(a) The permittee shall calibrate and install a pressure measurement device (liquid manometer, magnehelic gauge, or equivalent instrument) on the loading rack's vapor collection system at each loading position.

(i) The pressure measurement device must be capable of measuring up to 500 mm of water gauge pressure with ±2.5 mm of water precision.

(ii) The pressure measurement device must be installed at a pressure tap located as close as possible to the connection between the delivery tank and the loading rack vapor collection system. See Figure IV.I.4-1. The pressure measurement device may be installed on a coupling which can be used between the delivery tank and vapor collection system. See Figure IV.I.4-2.

(b) While a delivery tank is loaded at each loading position, the permittee shall record

(i) the pressure at that loading position every five minutes; and
(ii) the highest instantaneous pressure at that loading position.

(c) If the highest recorded pressure exceeds 450 mm of water, the permittee shall

(i) repair the liquid loading and/or vapor collection equipment to prevent the pressure from exceeding 450 mm of water; or
(ii) correct the operation of that equipment to prevent the pressure from exceeding 450 mm of water.

(d) The permittee shall repeat the procedures in this section until the highest recorded pressure at each loading position is ≤ 450 mm of water.

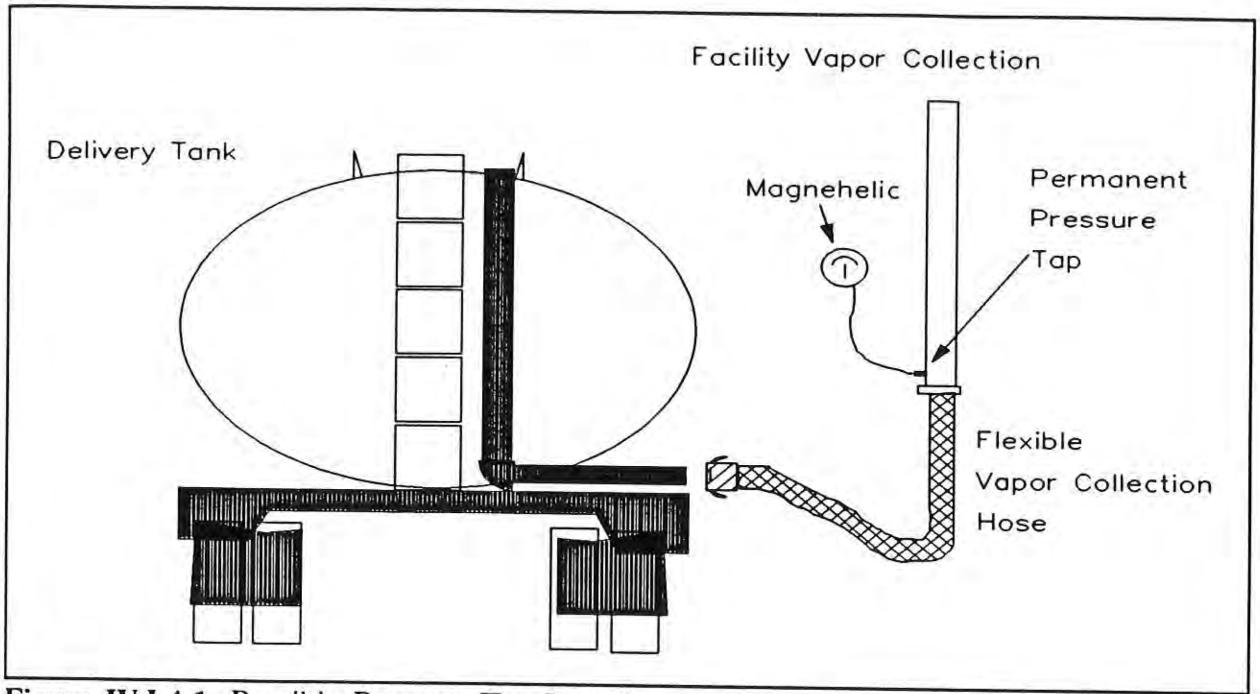


**Figure IV.I.4-1** Possible Pressure Tap Location.

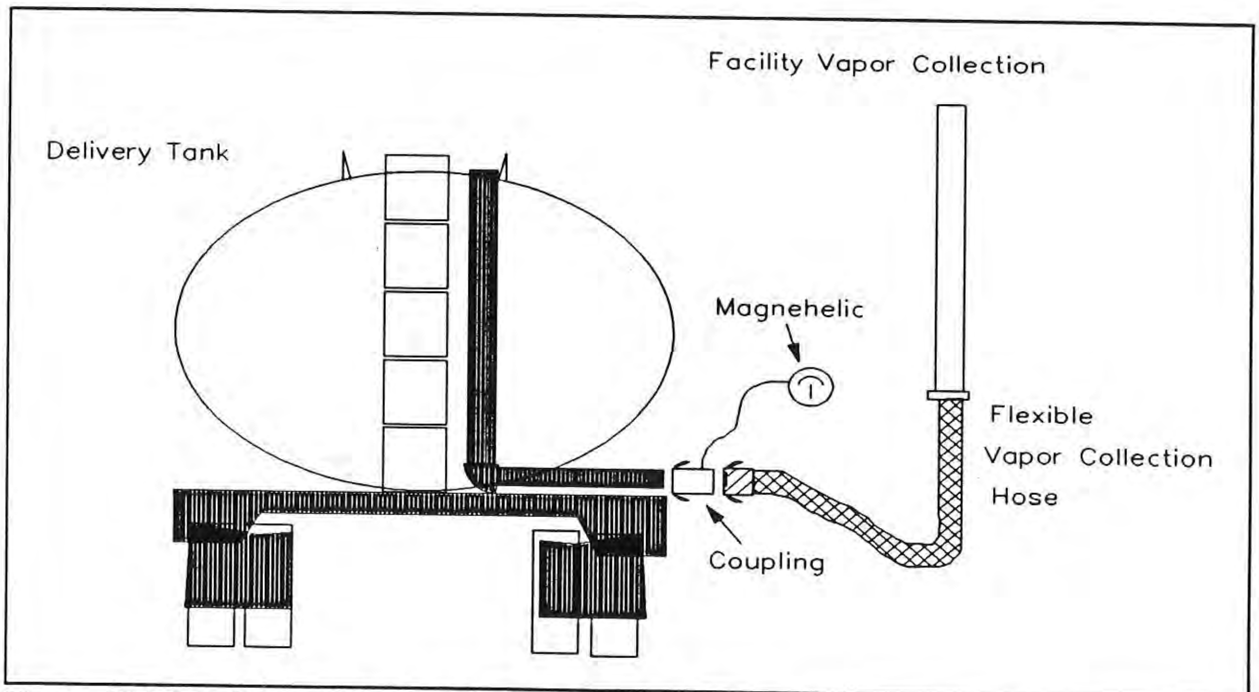


**Figure IV.I.4-2** Removable Coupling with Pressure Tap.

## 5. TANK TRUCK and RAIL TANK CAR REQUIREMENTS

Under 18 AAC 50.066, the owner or operator of a delivery tank (tank truck, trailer, or rail tank car) loading a volatile liquid at a regulated loading rack must

- annually certify that the delivery tank is vapor-tight;
- mark the delivery tank with the date of certification;
- provide a copy of the vapor-tightness testing results to the owner or operator of the regulated loading rack; and
- to keep a copy of the test results with the delivery tank.

This portion of the State Air Quality Control Plan specifies the procedures used to comply with these requirements.

### a. HOW TO CERTIFY A DELIVERY TANK VAPOR-TIGHT

The owner or operator of a delivery tank shall certify a delivery tank as vapor-tight using the following procedures. **A CERTIFICATION IS VALID THROUGH THE DATE ONE YEAR FROM THE LAST DAY OF THE MONTH THE DELIVERY TANK PASSES THE CERTIFICATION TEST.** For example, if a delivery tank passes the vapor-tightness test on October 1, 1993, then the vapor-tightness certification is valid through October 31, 1994.

i. The owner or operator shall test the delivery tank using the pressure test described in **EPA test method 27**[n], as modified by the following definitions:

(1) Time Period of the Pressure Test (t) is five minutes;
(2) Initial Pressure ($P_i$) is 450 mm of water (17.7 inches of water);
(3) Allowable Pressure Change ($\Delta p$) is 75 mm of water (3 inches of water); and
(4) Gasoline means volatile liquid.

ii. The delivery tank is certified vapor-tight if the average measured change in pressure is less than or equal to the Allowable Pressure Change ($\Delta p$). If the average measured pressure change exceeds $\Delta p$, the owner or operator shall repair the vapor leaks in the delivery tank and repeat the pressure test until this criterion is met.

iii. No static vacuum test is required.

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[n] *40 C.F.R. 60, Appendix A, revised as of July 1, 1991.*

## b. FORMAT FOR CERTIFICATION TEST RESULTS

The certification test results must include at a minimum the following:

i. Test title: EPA test method 27 – delivery tank test;
ii. Tank owner and address;
iii. Tank identification number;
iv. Test location;
v. Test date (month/day/year);
vi. Tester's name and signature;
vii. For each test run:
  (1) Initial pressure,
  (2) Final Pressure, and
  (3) Elapsed time; and
viii. Average measured pressure change.

## c. HOW TO MARK A DELIVERY TANK AS VAPOR-TIGHT

The owner or operator of each vapor-tight delivery tank shall mark the delivery tank with the month and year the tank last passed the vapor-tightness certification test according to the following procedures:

i. The delivery tank must be marked with letters and numerals at least four inches high;

ii. The color of the letters and numerals must contrast with color of the tank;

iii. Delivery tanks that are tank trucks or trailers must be marked on the front right-side of the delivery tank (see Figure IV.I.5-1);

iv. Delivery tanks that are rail tank cars must be marked on both sides. The exact location is not specified, but the markings must be clearly visible; and

v. The markings must be "V - *month/year.*"

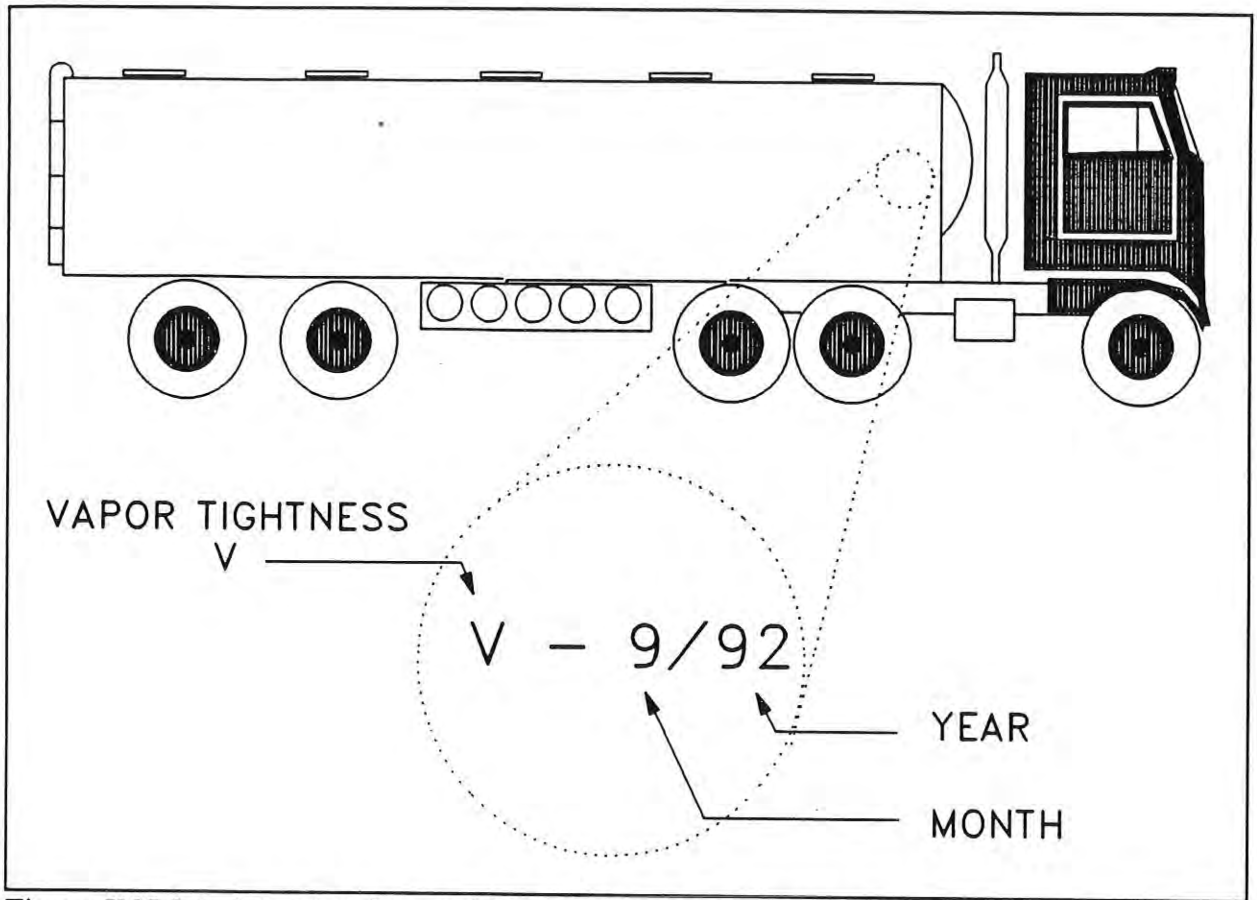


Figure IV.I.5-1 Location for marking a delivery tank as vapor-tight.

# 6. RECORDKEEPING and REPORTING

## a. GENERAL

18 AAC 50.520(d) states that "the department will, in its discretion, require the owner or operator of a volatile liquid storage tank, loading rack, or delivery tank subject to 18 AAC 50.065 or 18 AAC 50.066 to periodically inspect air pollution control equipment; repair any deficiencies detected; and report and keep records of all inspections and repairs as necessary to determine compliance with this chapter." This section lists the reports and records the department deems necessary to determine compliance with 18 AAC 50.065 and 18 AAC 50.066.

The permittee shall keep records of all inspections, leak tests, and repairs required by this subpart. The permittee shall keep each such record on file at the facility and available for inspection for at least two years after the date the record was prepared.

## b. STORAGE TANKS

A permittee who operates a volatile liquid storage tank subject to 18 AAC 50.065 shall keep records and report to the department's regional office as described below. All records of inspections must include

- the date of inspection; and
- the name and signature of the person performing the inspection.

### i. ALL VOLATILE LIQUID STORAGE TANKS

For each tank that contains volatile liquids, the permittee shall keep records of the type(s) of volatile liquid and the periods of storage.

### ii. INTERNAL FLOATING ROOF TANKS

(1) Records

(a) The permittee shall keep records of all internal floating roof tank inspections that are specified in this subpart.

(b) The permittee shall keep records of the condition of each of the parts of the floating roof identified in 4.a.i of this subpart for each inspection. The permittee shall keep records of necessary repairs.

(2) Notification

(a) The permittee shall notify the department in writing at least 15 days in advance of initial and annual inspections, and inspections to be performed when the tank is emptied and degassed. This is to allow the department the opportunity to observe the inspection.

(b) The permittee shall notify the department by telephone within 24 hours of conditions found during annual inspections that require emptying and degassing the tanks and identify the repairs to be made.

### iii. CLOSED VENT/CONTROL DEVICE SYSTEMS

(1) Records

(a) The permittee shall keep records of all monitoring data required by the operating plan as approved and incorporated into the operating permit.

(b) The permittee shall keep records of the most recent performance test and the initial leak test. Each record must include

(i) the results of the inspection;
(ii) the date of repair of each leak detected, initialed by the person repairing or supervising the repair of the leak; and
(iii) any other information necessary to show compliance with 18 AAC 50.065 and this subpart.

(2) Notification and Reporting

(a) The permittee shall submit a copy of each performance test report to the department.

(b) At the time the performance test plan is submitted to the department, the permittee shall notify the department in writing of the expected date on which the test will be conducted. The permittee shall inform the department by telephone of any change in schedule as soon as possible, and in any event, **at least 24 hours in advance of the test.**

(c) In the event of a failure of the control device, the permittee shall notify the department's regional office immediately of such failure. The permittee shall complete repairs within 45 days of the failure of the control device, or discontinue tank loading operations until the repairs are completed.

## c. LOADING RACKS

### i. RECORDS

The permittee shall keep the records described in this section to demonstrate compliance with 18 AAC 50.066.

(1) <u>Records for volatile liquid loading racks that include a vapor control device</u>

(a) The permittee shall keep a permanent copy of the most recent control device performance test.

(b) The permittee shall keep a record of each monthly inspection for leaks. Each record must include

(i) the name and signature of the person performing the inspection;
(ii) the date of the inspection;
(iii) the name of the owner of the delivery tank being filled during the inspection;
(iv) the identification number of the tank being filled during the inspection;
(v) the results of the inspection; and
(vi) the date of repair of each leak detected, initialed by the person repairing or supervising the repair of the leak.

(c) The permittee shall keep a record of each annual inspection of the pressure in the vapor collection system. Each record must include

(i) The date of the inspection;
(ii) The name and signature of the person performing the inspection;
(iii) For each loading position;
1) the name of the owner of the delivery tank being filled during the inspection;
2) the identification number of the tank being filled during the inspection;
3) the results of the inspection; and
4) the date of repair of each over pressure detected, initialed by the person making the repair or supervising the repair.

(d) The permittee shall keep records that demonstrate that every delivery tank loaded with volatile liquid at the facility was certified vapor-tight according to the procedures set forth in this subpart within the 12 months preceding each loading of that delivery tank. These records must be either

(i) records documenting that the permittee has followed the procedures described in **40 C.F.R. 60.502(e)**[o]; or

(ii) records documenting that the permittee has followed alternative procedures approved by the department.

(2) Records to demonstrate actual volatile liquid loadings are less than 15 million gallons per year.

A permittee for whom the department has approved physical or operational restrictions to limit the annual throughput of volatile liquid to less than 15 million gallons per year shall keep records that

(a) show the amount of volatile liquid loaded at the facility, by month; and

(b) show the total quantity of volatile liquid loaded at the facility during the preceding 12 months.

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[o] *48 Fed. Reg. 37,590 (Aug. 18, 1983); 48 Fed. Reg. 56,580 (Dec. 22, 1983), as amended at 54 Fed. Reg. 6678 (Feb. 14, 1989).*

### ii. NOTIFICATION AND REPORTING

To meet the following requirements, a permittee shall report to the department's southcentral regional office.

(1) The permittee shall send a copy of the test report for any initial or subsequent performance testing conducted on the loading rack vapor control device.

(2) In the event the vapor processing equipment malfunctions so as to increase emissions beyond permitted levels, the permittee shall:

(a) Immediately notify the department's southcentral regional office of
   (i) what has malfunctioned; and
   (ii) when the malfunction will be repaired.

(b) Cease loading volatile liquid into delivery tanks until
   (i) the malfunction is repaired; or
   (ii) the administrator of the department's southcentral regional office, in his or her discretion, permits loading to continue.

(c) Delivery tanks that were loading volatile liquid when the malfunction occurred may complete that loading, but no delivery tank may begin loading until the above two conditions are met.

At the request of the administrator of the department's southcentral regional office, the permittee will submit a written report describing the details of the malfunction and the corrective actions taken by the permittee.

(3) The permittee shall notify the department's southcentral regional office at least 15 days prior to conducting any annual inspection of the volatile liquid loading rack.

## d. ALTERNATIVE EMISSION CONTROL SYSTEMS

The department will, in its discretion, specify recordkeeping and reporting requirements for alternative emission control systems. The requirements will be defined in operating permits and be based on the characteristics of the control system.

# SECTION V

# AMBIENT AIR MONITORING

ALASKA AIR QUALITY CONTROL PLAN

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SECTION V

## AMBIENT AIR MONITORING

### A. PURPOSE

The state air quality surveillance network is to provide:

1. an accurate and current definition of air quality throughout the state, as related to the time of year, meteorological and topographical conditions;

2. a means for evaluating the effectiveness of control strategies for achievement of ambient air standards, and maintenance of existing air quality;

3. data for activating emergency control measures, and

4. air quality trend data which may be related to industrial development, urbanization or other activities.

The statewide air monitoring network is operated cooperatively between the state and local air pollution control programs in Anchorage and Fairbanks. The department's central office in Juneau serves as a focal point for the collection of all statewide monitoring data. The following sections present a general description of the statewide air monitoring network, a summary of data collected thus far from all monitoring sites, and the quality assurance procedures to be followed for assuring accuracy of data.

Ambient air quality data is also collected, analyzed and submitted to the department by applicants for Prevention of Significant Deterioration permits. This data will aid substantially in quantifying ambient air quality conditions in nonpopulated areas, and will be added to the data collected by the agencies and evaluated in the annual summary. While the state will not perform site-specific ambient monitoring for PSD permit applicants, data from the state air monitoring network will be made available to the PSD applicants to the extent that it will aid in their air quality analyses. Monitoring requirements for permit applicants under the Prevention of Significant Deterioration requirements of the Clean Air Act are contained in Section V of Volume III of this plan.

The Alaska ambient air monitoring network, described in this section is designed to meet the provisions of the EPA regulation for monitoring air quality, 40 CFR Part 58.

## B. COMPLETED AIR MONITORING PROJECTS

Since 1973 the air monitoring network in the state has measured ambient concentrations of carbon monoxide, sulfur dioxide, nitrogen oxides, ozone, lead and total suspended particulates. Additional monitoring performed by the private sector in support of permits for the Prevention of Significant Deterioration program has delineated air quality conditions in other areas of the state. All monitoring collected by the state, local agencies and that submitted by the private sector is a public record and, as such, is available to the general public upon request. Itemized below is a brief description of the monitoring results for the specific projects conducted.

### 1. Carbon Monoxide

The majority of air monitoring for carbon monoxide has been performed in the cities of Anchorage and Fairbanks. Portions of each city have been declared nonattainment zones for this pollutant because exposures above the health standard have been recorded since the early 1970s. Section III of this plan presents an in-depth assessment of the observed exposures, sources of the pollutant and probable methods of correcting the present situation.

Transportation sources have historically been the primary source of this pollutant in Alaska. However, significant increases in residential wood burning for home heating purposes may result in the expansion of existing air quality problems or the creation of new problem areas.

Monitoring of carbon monoxide at Prudhoe Bay demonstrated very low concentrations.

### 2. Nitrogen Oxides

At the present time, no locations in Alaska have been identified as having high concentrations of nitrogen dioxide. While nitrogen dioxide can affect a person's health, other oxides of nitrogen, in addition to nitrogen dioxide, are precursors of ozone and acid rain. Presently, it is anticipated that the latter two situations are not a threat to the environment of Alaska. However, a monitoring project is currently underway in the Kenai Penninsula to measure oxides of nitrogen relative to the formation of acid rain.

Other monitoring projects for nitrogen oxides have been performed in Valdez and Prudhoe Bay. Levels in Valdez have been found to be relatively low. Concentrations measured at Prudhoe Bay prior to most of the oil development indicated very low exposures of nitrogen dioxide. However, computer model projections of ambient exposures when all oil development facilities are installed indicate a significant concentration of nitrogen dioxide. Future additional facilities at Prudhoe Bay may warrant actual monitoring of concentration levels.

3. Sulfur Dioxide

For several years a wet chemical method was utilized to measure sulfur dioxide every sixth day near the two pulp mills in southeast Alaska. All collected data indicated exposures well below the sulfur dioxide standards. These monitors have been replaced by an instrumental analyzer which continuously measures the ambient concentration. The instrument located near the pulp mill at Sitka again demonstrated very low values. Data is currently being gathered near the pulp mill at Ketchikan.

For several years monitoring of sulfur dioxide was performed at a number of locations around Valdez. Early computer projections indicated that operation of pipeline terminal facilities and emissions of oil tankers would result in violations of the standard. These projections were incorrect through actual monitoring. The monitoring demonstrated occasional elevated exposures of sulfur dioxide. However, the highest recorded concentration was 60% of the ambient standard.

Monitoring for sulfur dioxide is currently being performed in the Kenai Penninsula for an acid rain assessment project. In the city of Anchorage an instrument has been installed to measure the ambient impact of a coal burning power plant. Although data is now becoming available for both of these monitoring locations, it is anticipated that these monitoring projects will be active for two to three years.

4. Ozone

Monitoring of ozone has been conducted in Valdez and Prudhoe Bay. Essentially, these monitors have been measuring natural background levels. Measured values were very low throughout the year except during the spring. During this season values were elevated with a maximum of approximately 60% of the standard. Since these elevated values were associated with specific climatic conditions, it has been therorized that ozone-rich lenses of the stratosphere have intruded into the lower atmosphere under these specific weather regimes.

In other areas of the country, elevated values of ozone are usually attributed to atmospheric reactions of other air pollutants in the presence of warm temperature and intense sunlight. Presently, it is not anticipated that high ozone levels will occur in Alaska since ambient temperatures are lower and solar radiation is less intense. For purposes of verification, the Municipality of Anchorage is now operating an ozone monitor in the Anchorage area.

5. Total Suspended Particulates (TSP)

Although some areas of the state have experienced TSP concentrations above the national standards, most of the particulates are too large in size to be inhaled. These large particles, which are mostly made up of wind blown dust particles, do not constitute a health hazard, and TSP monitoring data will not necessarily indicate a health related problem unless a small-particulate source is nearby. The U.S. Environmental Protection Agency has recognized that these high TSP concentrations are

not a health risk and therefore declared the state to be in attainment for total suspended particulates.

Recently, because of the resurgence of wood use for home heating purposes, some specific locales within the state have exhibited high TSP concentrations. Particulates emitted from wood burning are small in size and therefore do present a health risk when concentrations approach or exceed the standard. During November of 1982, several days in the Mendenhall Valley of Juneau were found to exhibit TSP exposures significantly above the state ambient standard. As a result of these high concentrations, several air quality alerts and three air quality emergencies were issued by the Department when high pollution concentrations were anticipated. The alert system, through the cooperation of the wood users, has effectively kept the TSP levels below state and federal standards. Through chemical analysis of the TSP samples and utilization of a computer technique called receptor modeling, an apportionment of the actual paticulate exposure generated by each source in the Mendenhall Valley was determined. This report entitled "Preliminary Source Apportionment of Winter Particulate Moss in Juneau, Alaska" is available upon request.

Ambient monitoring for total suspended particulates has been more widely performed than all other pollutants. Data is available for many of the smaller communities of the state, in addition to the cities of Anchorage, Fairbanks, and Juneau.

Through requirements of the Clean Air Act, the U.S. EPA has been mandated to establish a more appropriate method of measuring suspended particulate matter. This new method, which will more directly correlate to the human body's ability to inhale the particles, has not been developed as yet.

6. Lead

Ambient monitoring for lead has been conducted at two locations in Anchorage and three locations in Fairbanks. Upon the completion of a two-year data gathering project, exposure levels have been determined to be below state and federal standards (see Table III.H-1). The highest concentrations have been observed during the winter season. Monitoring will continue in both cities although at a reduced level to track any future trends in the human exposure to this pollutant.

## C. AIR MONITORING NETWORK

Several changes have been made in the state monitoring system using the original Air Quality Plan in 1972, because the purposes for which some of the sampling sites were originally selected have been satisfied. The discussion below describes the air monitoring network which should produce sufficient data to monitor Alaska's air quality conditions. This monitoring system will be reviewed annually by the Department to determine any modifications in the network. Any proposed changes to the State and Local Air Monitoring Station network will be approved by the Ambient Monitoring and Analysis Branch of the Region X office of the U.S. EPA prior to implementation. New monitoring equipment will be considered if other pollutants are identified or if potential problems with existing pollutants arise.

All continuous monitors will operate throughout the year. The particulate monitors will operate for 24 hours every sixth day, according to the schedule contained in the State Quality Assurance Handbook for Ambient Monitoring.

U.S. EPA criteria have been adopted by the State to describe how large of an area is to be represented by each monitoring site. These areas have been divided into "scales" of representativeness, and those of most interest in Alaska are as follows:

- Microscale - defines the concentrations in air volumes with dimensions ranging from meters up to about 100 meters.
- Middle scale - defines the concentrations typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.
- Neighborhood scale - defines concentrations within an extended area of the city that has relatively uniform land use with overall dimensions in the 0.5 to 4.0 kilometer range.
- Urban scale - defines the overall, citywide conditions, with overall dimensions on the order of 4 to 50 kilometers. This scale would usually require more than one site for definition.

The State Quality Assurance Handbook for Ambient Monitoring describes the air monitoring network, its operation and how data is to be retrieved with a high degree of precision and accuracy.

### 1. Network Description

A full description of the monitoring network is available for public inspection at the Department's central office in Juneau and in each of the regional offices located in Juneau, Anchorage and Fairbanks. The network description will consist of the following for each station in the air quality surveillance network:

a) The SAROAD site identification form;
b) The identification of the monitoring method or analyzer;
c) The identification of any necessary method of sample analysis;
d) The sampling schedule;
e) The monitoring objective;
f) The spatial scale of representativeness.

2. Station Designations

Each station in the air quality surveillance network described in this section is identified as a "State and Local Air Monitoring Station." The purpose for the identification is to coincide with the U.S. EPA's intention to systematically evaluate the overall trends in pollution control throughout the United States. EPA and the State will select a number of sampling stations from the State and Local Air Monitoring Station Network for reporting data to satisfy EPA's requirement for nationwide trend data. This subset of stations will be called "National Air Monitoring Stations."

A third type of station is defined by EPA as a "Special Purpose Monitor." The Special Purpose Monitor is one that is not included in the State and Local Air Monitor Station network. Data from this type of station will not normally be submitted to EPA, and a Special Purpose Monitor will not necessarily need to meet the siting requirements or the monitoring requirements imposed upon the State and Local Air Monitoring Station network. The data collected form the special studies will be evaluated as part of the department's annual air quality report.

3. Air Quality Monitoring Procedures

Insofar as is possible, all ambient air monitoring stations in the State of Alaska's state and local air monitoring station network will be operated in accordance with the criteria established by Subpart B of 40 CFR Part 58, and will be sited in accordance with the siting parameters contained in Appendix E to 40 CFR Part 58.

Each continuous analyzer will be operated on a continuous basis and data reported as hourly averages. Each manually operated sampler will be operated for a full 24-hour period at six day intervals. All sampling methods used in the state network will be reference methods or equivalent methods as defined by EPA in 40 CFR Part 58.

The quality assurance procedures of Appendix A to 40 CFR Part 58 will be followed to the extent possible when operating the network and processing air quality data. ADEC will provide for auditing services for operators of all instruments designated as State and Local Air Monitoring stations.

All data will be submitted to ADEC for subsequent analysis and storage. The data handling and submission requirements are outlined in the State Quality Assurance Handbook for Ambient Monitoring.

4. Ambient Sampling for Specific Pollutants

This section describes general characteristics of the state air monitoring network. As changes are made to the network, they will be identified in the State Quality Assurance Handbook for Ambient Monitoring.

Carbon Monoxide

Monitors for carbon monoxide in Anchorage and Fairbanks will be placed so that the appropriate following measurement scales are represented in the State and Local Air Monitoring Station network:

a. One monitor in a microscale location downtown, to represent a maximum concentration. (not determined yet)

b. One monitor in a neighborhood scale location, to represent a maximum concentration in a neighborhood.

Total Suspended Particualtes (TSP)

The particulate monitoring data gathering will concentrate on measurement of particulates near industrial sources to make certain that potential ambient air problems do not develop. Particulate sampling in larger populated areas will be done to monitor area source emissions and the progress of dust control programs.

In Anchorage, the Anchorage Air Pollution Control Agency will operate particulate monitors in the National Air Monitoring Station network as follows:

a. One monitor located in a neighborhood scale site. (3000 E. 16th)

b. One middle scale site in the downtown area. (527 E. 4th)

c. One monitor located to represent a maximum concentration in a neighborhood scale area. (3500 Tudor Road)

Other samplers operated by the Anchorage Air Pollution Control Agency in the State and Local Air Monitoring Sation network are illustrated in the State Quality Assurance Handbook for Ambient Monitoring.

In Fairbanks, the Fairbanks North Star Borough will operate particulate monitors in the State and Local Monitoring Station network as illustrated in the State Quality Assurance Handbook for Ambient Monitoring. No National Air Monitoring Stations will be operated in Fairbanks.

Lead

Monitoring for ambient lead exposure will emphasize measurement near transportation right-of-ways. Previous studies indicated that vehicle emission of lead is the primary source of this pollutant in Alaska. Although current exposures are below the health standards and observed concentrations are anticipated to decrease, monitoring will continue in the cities of Anchorage and Fairbanks. For this purpose, one monitor will be maintained to measure middle scale exposures in Anchorage and Fairbanks. These monitors are designated as State and Local Air Monitoring Stations.

Nitrogen Oxides, Sulfur Dioxide and Ozone

Monitoring for these pollutants will be performed at specific locations when and if a potential problem for a pollutant is suspected. Current monitoring is outlined in part B of this section.

## D. EPISODE MONITORING

Development of episode monitoring plans is the responsibility of local agencies. The episode monitoring plan developed by the Anchorage air program is in Section III.B.10 of this volume. The episode monitoring plan developed by the Environmental Services Department of the Fairbanks North Star Borough is Section III.C.10 of this volume.

## E. ANNUAL REVIEW

The Alaska Department of Environmental Conservation will publish an annual review of the air monitoring system each June 30. The review will include the following:

1. A summary and evaluation of all data collected for the preceeding calendar year. Data will be used from State and Local Air Monitors and Special Purpose Monitor.

2. A determination of adequacy of the network. The network and the data collected will be examined to determine if there is a monitor in every location for which there is a need for data, or if all the stations in the network are necessary.

3. A schedule to add stations to the network, eliminate stations from the network or relocate sites will be established if necessary.

4. A summary of all ambient air data submitted as part of any PSD permit application.