1999 Air Toxics Emission Inventory – Final Report

for

Anchorage, Fairbanks, and Juneau, Alaska

prepared for the

Alaska Department of Environmental Conservation

June 2001

Final Report

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Contract #18-4014-00

for

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Alaska

prepared for the

Alaska Dept. of Environmental Conservation

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1.0 Introduction

1.1 Purpose and Need

The Alaska Department of Environmental Conservation (ADEC) recently initiated a study of hazardous air pollutant (HAP) emissions in Alaska as one of the first steps in development of an Alaska air toxics program. HAPs, sometimes called air toxics or toxic air pollutants, are potentially harmful substances in the air that come from anthropogenic (vehicles, industrial facilities) or natural sources (radon gas, volcanic ash). Inhaling toxic air pollutants can increase the chance that a person will experience health problems.

In the Clean Air Act Amendments of 1990, Congress identified 188 HAPs,[1] which are to be managed in two phases. The first phase is the development of technology-based emission standards for stationary sources of HAPs with standards applicable to large (called "major") sources and smaller (called "area") sources. The second phase is to develop an as-yet undefined regulatory program to address risks identified through a series of studies of HAP emissions from all sources. In support of program development, the U.S. Environmental Protection Agency (EPA) initiated a National Toxics Inventory (NTI) in 1993. Emission inventories like the NTI provide important information to help identify risks, prioritize regulatory initiatives, and monitor progress toward achieving program goals. While the primary intent of the ADEC HAP inventory is to provide a basis for air toxics management in Alaska, the emissions data will also be submitted to EPA for use in the NTI.

1.2 Inventory Goals

In assessing the risks of air toxics, regulatory agencies generally rely on three types of information:

1. What HAPs are being released, and how toxic are they? For instance, can they cause immediate death, serious health effects such as cancer or birth defects, or other serious illnesses?
2. How much of each HAP is released into the air?
3. Where is each HAP released, and how many people or sensitive plant and animal populations are exposed to them?

[1] The Clean Air Act Amendments of 1990 actually identified 190 HAPs. Hydrogen sulfide was included on the original list due to a clerical error and was subsequently removed by Congress in 1991. Caprolactam was delisted by the U.S. Environmental Protection Agency in 1996.

What HAPs are being released in Alaska? The first goal of the study is to identify which of the 188 Congressionally-designated HAPs are released into the air in Alaska. (Toxicity is usually reviewed as part of a risk assessment, not part of an emission inventory.) HAPs are released from a wide variety of activities. Many of those activities have been studied to quantify emissions per unit of activity, and HAP emission factors have been published. Therefore, significant pollutant-emitting activities in Alaska must be identified, and then a search of accepted EPA data sources must be conducted to determine which HAPs are released by the particular activity and at what rate.

How much of each HAP is being released into the air? In determining how much of each HAP is released into the air, it is convenient to divide pollutant-emitting activities into traditional source categories of mobile and stationary sources. The NTI reports data for two mobile and two stationary categories:

- On-road mobile sources
- Off-road mobile sources
- Area sources (small stationary)
- Point sources (large or major stationary)

Other reasons for basing the emission inventory on these source categories are that many of the emission estimating models have been developed based on these categories, locating where the emissions are released is generally based on source category, and regulatory programs are typically designed to target one of these categories. The time period for determining how much of each HAP is released into the air was designated as calendar year 1999 with subdivisions for summer (April through September) and winter (January through March; October through December). Calendar year 1999 was chosen to coincide with the every-third year cycle of the NTI (1993, 1996, 1999,...); a division between winter and summer has been targeted to see if there are significant seasonal differences in emissions and ultimately air quality risks.

As a practical matter, a comprehensive inventory of Alaska air toxics is not feasible at this time due to budget and schedule constraints. Thus, the ADEC decided to develop a less extensive inventory targeted at the largest source concentrations. National inventory data indicate that gross HAP emissions are larger in urban areas than rural. As a result, the ADEC determined that one of the priorities for this initial study is to inventory the largest urban areas in Alaska, including:

- Municipality of Anchorage (MOA)
- Fairbanks North Star Borough (FNSB)

- A smaller Alaska community (later determined to be the City and Borough of Juneau (CBJ))[2]

See Figures 1-1, 1-2, and 1-3 for general maps of each of these areas.

An inventory for a smaller community is desirable because Alaska has numerous towns that do not have the same emission characteristics as either the large urban areas or the more remote bush communities. Juneau was chosen as the smaller community because it is typical of many of the coastal towns that are not connected to the road network, and a significant amount of information already exists about Juneau emissions. Bush communities would be addressed by identifying the types of pollutant-emitting activities in these areas and gathering available emission factors (Appendix F). In this way emission estimates for a bush village could be developed as activity data become available.

Where are the HAPs being released? In characterizing risks from air toxics the concentration in the ambient air must be modeled. However, modeling cannot be completed without first identifying the locations of the sources emitting HAPs. Thus, the emissions from each of the four source categories needed to be "gridded" (located) for Anchorage. Fairbanks and Juneau gridding would be deferred due to budget constraints.

1.3 Quality Assurance

For data to be accepted as part of the NTI, it would need to be reviewed through a formal quality assurance (QA) procedure. Thus, an Inventory Preparation Plan (IPP) was developed and followed during preparation of the inventory (see Appendix A). Additionally, a QA reviewer from ADEC staff unaffiliated with preparation of the inventory was assigned to the project to provide an independent review of methods and implementation

[2] When referring to Anchorage, Fairbanks, or Juneau throughout the text and supporting documentation, we mean the entire MOA, FNSB, or CBJ, respectively.

Figure 1-1

Municipality of Anchorage Map

(use map from Interim Report)

Figure 1-2

Fairbanks North Star Borough Map

(use map from Interim Report)

Figure 1-3

City and Borough of Juneau Map

(use map from Interim Report)

2.0 Methodology

An overview of the emission inventory methodology as it was applied to each of the four source categories is provided in this section. A more detailed description is provided in the IPP (Appendix A), and further details on the emission calculations are provided in the source category appendices (Appendices B – F).

2.1 General Approach

HAP-Emitting Activities. To determine HAP emissions in each of the areas of interest, the first task is to identify activities that emit HAPs. For instance, combustion of wood, whether in stoves, fireplaces, wildfires, or prescribed burns, is known to emit certain HAPs. Thus, for each source category – on-road mobile, off-road mobile, area, point – a method was developed to identify the types of activities that occur in Alaska in each study area.

HAP Emission Basis. A calculation of HAP emissions may generally be determined based on the intensity of a HAP-emitting activity as follows:

Emissions of a HAP = (emission per unit of activity) x (amount of activity in 1999)[3]

The "emission per unit of activity" is commonly referred to as an "emission factor." Ideally all HAP-emitting activities have been studied in detail with emissions factors quantified, published in scientific literature, and endorsed in regulatory guidance documents. In reality, however, many activities have not been studied in sufficient detail to develop widely-accepted emission factors. Therefore, for each HAP-emitting activity in Alaska, a search for emission factors needed to be conducted to determine if emissions could be estimated. The search for each of the source categories generally focused on EPA published databases although supplemental data sources were used when appropriate.

1999 Activity Levels. The amount of activity occurring in each of the study areas in 1999, divided into winter and summer if possible, needed to be gathered for each HAP-emitting activity. Given the budget and schedule constraints of the project, a set of priorities was established for each of the source categories, and a search for the best-available data sources for the priority activities.

[3] The general emission estimation equation usually includes an additional factor for control efficiency. However, there are no identified HAP emission controls in the study areas so this factor is omitted.

Gridding. Once emissions are estimated, the geographic distribution needs to be established to prepare any modeling studies that may follow. The location of point and some area sources can be identified accurately, but other source categories either are mobile or else too numerous to pinpoint. As a result, emissions are assigned to grid cells that range in size from 1 km x 1 km to 10 km x 10 km. The grid cell is the smallest unit of geographic distribution, and the emissions are assumed to be evenly distributed throughout the cell. Gridding under this contract is limited to Anchorage.

A summary gridding report is provided in Appendix G.

2.2 On-Road Mobile Sources

HAP-Emitting Activities. Virtually all on-road mobile sources emit HAPs from the combustion of fuel. For purposes of estimating emissions, the EPA has classified the following categories of vehicles:

- Light-duty gasoline vehicles
- Light-duty gasoline trucks less than 6,000 lbs gross vehicle weight (GVW)
- Light-duty gasoline trucks 6,000 – 8,500 lbs GVW
- Heavy-duty gasoline trucks 8,500+ lbs GVW
- Light-duty diesel vehicles
- Light-duty diesel trucks less than 8,500 lbs GVW
- Heavy-duty diesel trucks 8,500+ lbs GVW
- Motorcycles

Emissions are estimated to the extent feasible for each of these categories of on-road mobile sources for each of the study areas.

HAP Emission Basis. HAP emissions from on-road mobile sources are estimated from two models. The first model is MOBTOX5b, which includes emission factors for the following pollutants:

- 1, 3-Butadiene
- Acetaldehyde
- Benzene
- Total organic gas (TOG)

TOG is not a HAP, but it may be speciated into numerous HAPs based on EPA speciation profiles. The second model is EPA's PART5, which can be used to estimate emissions of particulate matter (PM) from diesel vehicles. EPA speciation profiles for PM

can then be used to develop emissions of HAPs such as polycyclic organic matter (POM).

The MOBTOX5b model requires numerous input parameters for each type of vehicle. The primary indicator of activity is vehicle-miles traveled (VMT), although many other parameters affect emissions including vehicle age, operating mode, ambient temperatures, and gasoline formulation.

1999 Activity Levels. Travel data for Anchorage was obtained from the Transportation Planning Division of the Municipality of Anchorage. Travel data for Fairbanks was obtained from the Northern Regional Office of the Alaska Department of Transportation and Public Facilities (ADOT). No formal estimate of travel activity was available for Juneau. Data on traffic counts, roadway mileage and speed collected in Juneau was provided by ADOT. Sierra translated that information into estimates of travel activity for 1999. The results were reviewed and approved by ADEC staff. Information sources for each of the primary input parameters is documented in Appendix B.

Gridding. For on-road mobile sources, travel activity data in Anchorage had previously been organized into grid cells by the Municipality for the development of a carbon monoxide emissions inventory. That data was used to allocate toxic emission estimates into each of the 700+ grid cells for the community.

2.3 Off-Road Mobile Sources

HAP-Emitting Activities. There are a wide variety of off-road mobile source activities in Alaska, which emit HAPs from fuel combustion. Generally off-road mobile sources are analyzed as one of four classes of sources:

- Aircraft
- Trains
- Commercial marine vessels (CMV)
- Other nonroad engines

Large international airports operate in Anchorage and Fairbanks, and a regional hub airport is located in Juneau. There is also a busy small plane airport (Merrill Field) and floatplane/skiplane base (Lakes Hood and Spenard) in Anchorage, with several smaller airstrips in each of the communities. Additionally, Elmendorf Air Force Base (AFB) is located within the MOA and Eielson AFB is located within the FNSB. Both of these bases have significant aircraft operations throughout the year. Fort Richardson in the MOA and Fort Wainwright in the FNSB have lesser amounts of aircraft activity.

Railroad yards are located in Anchorage and Fairbanks with year-round activity, and the associated HAP emissions from locomotives. Juneau does not have a railroad.

CMV traffic is summer-peaking in Juneau due to significant cruise ship tourism activity and year-round ferry traffic. The Port of Anchorage does not have significant cruise ship activity, but does have steady year-round cargo and bulk fuel shipping operations. Fairbanks is inland with insignificant CMV traffic on the Chena and Tanana Rivers.

EPA's draft NONROAD emission estimating model identifies about 80 basic and 260 specific types of off-road sources (see Appendix C) for construction, maintenance, and recreational purposes in the following categories:

- Recreational vehicles (e.g., snowmachines, all-terrain vehicles)
- Recreational marine vessels (power boats)
- Residential and commercial yard equipment (lawnmowers, snowblowers)
- Logging equipment (chainsaws)
- Agricultural equipment (tractors)
- Construction equipment (graders, backhoes)
- Industrial equipment (forklifts, sweepers, mining apparatus)

HAP Emission Basis. Since virtually all off-road mobile source emissions result from fuel combustion, HAP emissions are generally based on a speciation of TOG and PM emissions. Thus, the primary task for each of the off-road mobile source categories is to determine the best method for estimating TOG and PM emissions.

For aircraft operations, the Federal Aviation Administration (FAA) in cooperation with the U.S. Air Force developed a model for estimating emissions from civilian and military airports. The model, Emissions and Dispersion Modeling System (EDMS), estimates emissions of pollutants including total hydrocarbons and PM from aviation sources, particularly aircraft, auxiliary power units on aircraft, and ground support equipment (GSE). EDMS can also be used to estimate emissions from non-aviation sources at airports including powerplants, fuel storage tanks, and vehicles. EMDS methodologies for estimating emissions are based on:

- FAA Aircraft Engine Emission Database
- MOBILE5a (EPA)
- PART5 (EPA)
- TANKS (EPA)
- WIND (EPA)

Thus, some of the same models used to estimate emissions for other source categories (onroad mobile, area, point) are also built into EDMS for airport emissions. Key indicators of airport activity are landings and takeoffs (LTO), fleet mix, cycle times for LTOs, and GSE activity. Once emissions are estimated from EDMS, speciation profiles for hydrocarbons and PM may be applied to determine individual HAP emissions.

Railroad emissions are developed from fuel combustion from locomotives. Speciation of hydrocarbon and PM emissions into HAP compounds is based on EPA toxic fractions.

HAP emission factors from commercial marine vessels are not readily available. A study of CMV fuel use was conducted for EPA, which developed curves for distillate fuel use for various ship sizes and operating scenarios. Using the assumption that marine engines have similar emission characteristics to stationary diesel engines, emissions can be estimated from information about ship size and number of port calls. There are a few ships operating in the study area that burn residual fuel in boilers for steam turbines. Fuel use and emissions for these marine boilers was assumed to be similar to stationary boilers, so that emissions may be calculated from the size of the ship powerplant along with the number of port calls. A typical ship powerplant size was estimated for cruise ships based on industry estimates and for ferries based on publicly-available information. Information on the powerplants for the primary cargo ships using the Port of Anchorage were obtained from the ship operators.

For the remainder of the off-road mobile sources, the NONROAD model provides an estimate of either total hydrocarbons or TOG and PM based on equipment population and end-use characteristics for a given locality. Emissions from nonroad engines are difficult to estimate as a whole because of the wide variety of engine models and applications, and the shortage of emission studies available. However, NONROAD provides estimated emissions for various equipment sizes, ages, and fuel types (gasoline, diesel, compressed natural gas, liquefied petroleum gas).

1999 Activity Levels. Total commercial domestic LTOs and fleet mix for Anchorage International Airport (AIA), Fairbanks International Airport (FIA), and the Juneau Airport for 1999 were obtained from the FAA. Supplemental information such as international LTOs, small commercial activity (including helicopters in Juneau), and LTOs for Lakes Hood and Spenard were obtained from the respective airport staffs. LTO data for Merrill Field were obtained from MOA reports. Estimates of military aircraft LTOs and fleet mix for Elmendorf and Eielson were obtained from publicly-available base planning documents. Fort Wainwright data were obtained from sources at the Post; aircraft activity at Fort Richardson is not available, but is believed to be insignificant compared to the previously-cited airports.

Railroad activity data were provided by the Alaska Railroad Corporation for Anchorage and Fairbanks. Information was provided for both mainline and yard activity levels.

For Juneau, the 1999 cruise ship and ferry schedules are in the public domain, and total emissions were estimated based on typical ship size. Port of Anchorage emission estimates are based on information provided by the two largest cargo ship operators on the total number if port calls for their respective vessels, and tanker and barge traffic are from actual data for 1995.

Gridding. Emissions of aircraft activity will be allocated to the grid cells where the airports are located. Railroad emissions will be assigned proportionally to the cell where the railroad yards are located and to the main rail lines through Anchorage. Similarly, vessel emissions will be gridded to the cells at the Port of Anchorage, and to the shipping lanes located within MOA.

Nonroad emissions will be gridded based on knowledge about where the activity is located. For instance, snowmachine emissions will be assigned to areas where activity is known to occur. Chainsaw emissions will be allocated to areas with larger lots and less dense populations. Emissions from garden equipment and snowblowers will be weighted more heavily toward areas with single-family homes. Other nonroad emissions will be assigned similarly.

2.4 Area Sources

HAP-Emitting Activities. Area sources are generally stationary sources that are too small and diffuse to be inventoried as individual sources. EPA maintains a lengthy list of source categories in AP-42 for estimating emissions. This list was screened to identify the types of activities believed to exist in Alaska, then prioritized based on knowledge about the relative size of the source category emissions. The results of this screening analysis are provided in Table 2-1 (see Appendix D for the complete screening

Table 2-1

Results of Screening of AP-42 Area Source Categories
Based on Expected Significance of Source Category

Source Category	Likely Significance	
	High	Medium
External Combustion Sources		
Bituminous And Subbituminous Coal Combustion	X	
Fuel Oil Combustion	X	
Natural Gas Combustion	X	
Residential Fireplaces	X	
Residential Wood Stoves	X	
Waste Oil Combustion		X
Solid Waste Disposal		
Refuse Combustion	X	
Sewage Sludge Incineration	X	
Medical Waste Incineration	X	
Open Burning		X
Stationary Internal Combustion Sources		
Stationary Gas Turbines For Electricity Generation	X	
Gasoline And Diesel Industrial Engines		X
Large Stationary Diesel And All Stationary Dual-fuel Engines		X
Evaporation Loss Sources		
Dry Cleaning		X
Nonindustrial Surface Coating		X
General Industrial Surface Coating		X
Asphalt Paving Operations		X
Commercial/Consumer Solvent Use		X
Petroleum Industry		
Petroleum Refining	X	
Transportation And Marketing Of Petroleum Liquids	X	
Liquid Storage Tanks		
Organic Liquid Storage Tanks		X
Mineral Products Industry		
Hot Mix Asphalt Plants		X
Asphalt Roofing		X
Sand And Gravel Processing		X
Miscellaneous Sources		
Wildfires And Prescribed Burning		X
Fugitive Dust Sources		X
Paved Roads		X
Unpaved Roads		X
Heavy Construction Operations		X

Note: See Appendix D-1 for complete screening analysis.

analysis). The most effort was directed toward estimating emissions for the high priority categories. The medium priority categories were also addressed to the extent feasible. Area sources that may exist within the study area but are likely to have a low significance were not addressed unless the activity data was already available. Two additional source categories from the NTI were added to the inventory – structural fires and consumer products.

The Clean Air Act defines area sources also to include facilities that may be large enough be inventoried separately, but nevertheless do not emit enough HAPs to be classified as a "major" source. A search through ADEC permit files for major facilities for purposes of calculating point source emissions also yielded the smaller permitted facilities that are not major for HAPs. As shown in Table 2-2, a total of 130 facilities were identified in the study areas as potentially having air quality permits or applications. Of the 130 facilities, four facility operators had previously classified their facility's as major sources of HAPs; the remainder of the facilities were assumed to be area sources. Appendix D provides documentation on whether there is sufficient information to use the facility's emission inventory to determine HAP emissions or whether it must be grouped with other area sources. In some cases facilities with permits are in categories where there are numerous portable sources (e.g., asphalt plants, dirt burners). These facilities were addressed as top-down area sources to account for area-wide emissions rather than attempting to determine when the particular source was operating within one of the study areas.

Table 2-2

Classification of Potentially Permitted Facilities

	Anchorage	Fairbanks	Juneau
Major HAP sources	1	2	1
Area sources with facility-specific emissions	19	10	6
Area sources without facility-specific emissions	56	19	16
Total facilities in study areas	76	31	23

HAP Emission Basis. Emissions for small, diffuse area sources are estimated using a top-down methodology based on area-wide information. Often demographic statistics provide the most basic screening level emission estimates. For instance, dry cleaner emissions have been correlated to total population in the study area. Emission estimates can be improved if they can be calculated from study-area specific activity data, so whenever area source activity data were available they were used. For example, HAPs from commercial and residential natural gas heating in Anchorage are estimated from

historical data on total natural gas consumed in the commercial and residential sectors. Similarly, gasoline station and vehicle fleet refueling emissions in Anchorage are estimated from the total fuel dispensed in the MOA. Asphalt paving emissions are derived from the actual area paved. HAP emission factors for most of these source categories are published by EPA in documents and databases such as AP-42, FIRE, and SPECIATE.

For facilities that are area sources, facility-specific calculations were prepared where feasible. An ADEC file search was conducted for the facility permits and applications to determine whether the operator had already identified HAPs emitted and calculated emission rates. Even if the operator had not calculated HAPs, the emissions could be calculated from EPA HAP emission factors if facility source inventories were sufficiently documented in the permit or application. Some classes of facilities (for instance, dry cleaners and asphalt plants) generally did not have sufficient detail in permits and applications to calculate emissions. These facilities were addressed as a group source along with the remainder of the small, diffuse area sources.

1999 Activity Levels. Data for top-down area source categories was gathered from the best available source. Examples: Dry cleaner emissions were based on 1999 U.S. Census data for Anchorage. For natural gas heating, the most recent year of publicly-available consumption data by end-use sector is for 1990. Therefore, 1990 data was the base year natural gas data for the residential and commercial heating sectors adjusted for 1999 consumption based on the change in the number of households and population. Gasoline refueling in Anchorage was based on required data reports from fuel distributors as part of the nonattainment area management plan. Paving emissions were based on actual paving contracts for 1999 issued by the Department of Transportation and the local road maintenance agency, if available. See Appendix D for a complete listing of activity level data sources.

For facilities, activity data were gathered from 1999 facility operating reports (FOR), if available. If 1999 FORs were not available for a facility, a file search was conducted for the most recent year of operating data, and that year was assumed to be representative of 1999. Documentation of the actual year of operating data is provided in Appendix D.

Gridding. Top-down area source emissions will be gridded based on the key indicator of category emissions. For instance, architectural surface coatings are based on population so emissions will be distributed to Anchorage consistent with population densities. Surface coatings for traffic markings will be gridded based on VMTs similar to the on-road mobile source category. To the extent feasible, dispersed sources that are not too numerous will be identified by street address of the location. An example would be dry cleaners: dry cleaners in Anchorage can most likely be located and emissions allocated to each of the specific locations.

Facility area sources will be located based on the street address of the facility, and emissions will be assigned to the specific location.

2.5 Point Sources

HAP-Emitting Activities. Point sources are by definition major sources of HAPs. These sources are assumed to be already identified based on reporting obligations under the Clean Air Act for Title V purposes. Thus, a search through ADEC Title V permit application files was conducted, which yielded a total of four facilities in Anchorage, Fairbanks, and Juneau. The operators of the following facilities reported their determination that they are major sources of HAPs:

- ENTECH (Anchorage)
- Fort Wainwright (Fairbanks)
- University of Alaska, Fairbanks
- USA Waste Incinerator (Juneau)

HAP Emission Basis. For each of the four HAP-major facilities, the expected emissions of HAPs was provided in permit documentation. The HAPs emitted and rate of emissions were gathered from those permit files.

1999 Activity Levels. Activity data were for the year inventoried by the operator for the facility permit application, and that year was assumed to be representative of 1999. Documentation of the actual year of operating data is provided in Appendix E.

Gridding. Facility area sources will be located based on the street address of the facility, and emissions will be assigned to the specific location.

2.6 Bush Communities

HAP Emission Basis. Emission factors for bush or other remote Alaska communities are provided in Appendix F. These factors have been compiled from similar activities in Anchorage, Fairbanks, and Juneau.

Activity Levels. If activity levels for 1999 or any other time period are compiled, they may be used along with the emission factors in Appendix F to estimate HAP emissions for the activity of interest.

3.0 Summary of Results

A summary of the emission results for the on-road mobile, off-road mobile, area, and point sources are provided by study area in the tables that follow:

- Table 3-1 – Top 10 HAPs from all Sources in 1999
- Table 3-2 – Top 10 Source Types for Total HAPs in 1999
- Table 3-3 – Municipality of Anchorage
- Table 3-4 – Fairbanks North Star Borough
- Table 3-5 – City and Borough of Juneau

Detailed documentation of the emission calculations is provided in Appendices B through E.

Table 3-1

Top 10 Hazardous Air Pollutants Emitted from All Sources in 1999
Anchorage, Fairbanks, and Juneau

Section 112 Hazardous Air Pollutants				Estimated Emissions - Tons per Year					
Rank	No.	CAS No.	Chemical Name	Total HAPs Emitted in Study Area		On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
Municipality of Anchorage									
1	176	108883	Toluene	629	27%	146.6	103.3	378.7	-----
2	185	1330207	Xylenes (isomers and mixture)	391	17%	82.5	99.19	209.2	-----
3	48	71432	Benzene (including benzene from gasoline)	186	8.0%	119.4	59.05	7.187	-----
4	109	5000	Formaldehyde	172	7.4%	19.5	148.0	4.519	-----
5	174	127184	Tetrachloroethylene (Perchloroethylene)	172	7.4%	-----	-----	172.0	-----
6	133	78933	Methyl ethyl ketone (2-Butanone)	94	4.0%	-----	-----	94.03	-----
7	129	67561	Methanol	90	3.9%	-----	-----	89.97	-----
8	118	110543	Hexane	86	3.7%	18.39	16.30	51.37	-----
9	35	75070	Acetaldehyde	66	2.8%	11.28	54.61	0.460	-----
10	136	108101	Methyl isobutyl ketone (Hexone)	65	2.8%	-----	-----	64.52	-----
Fairbanks North Star Borough									
1	176	108883	Toluene	259	22%	65.8	52.89	137.6	2.340
2	185	1330207	Xylenes (isomers and mixture)	162	14%	37.13	50.15	73.31	1.100
3	120	7647010	Hydrochloric acid	161	14%	-----	-----	1.104	160.0
4	48	71432	Benzene (including benzene from gasoline)	107	9.3%	49.62	26.53	31.02	0.250
5	109	5000	Formaldehyde	104	9.0%	10.18	59.95	33.37	0.420
6	174	127184	Tetrachloroethylene (Perchloroethylene)	55	4.8%	-----	-----	55.12	0.090
7	133	78933	Methyl ethyl ketone (2-Butanone)	35	3.0%	-----	-----	34.46	0.390
8	118	110543	Hexane	33	2.9%	7.46	11.22	13.71	0.710
9	129	67561	Methanol	29	2.5%	-----	-----	28.95	0.010
10	35	75070	Acetaldehyde	26	2.3%	3.61	22.12	0.227	-----
City and Borough of Juneau									
1	176	108883	Toluene	284	32%	31.51	208.6	43.53	-----
2	185	1330207	Xylenes (isomers and mixture)	264	29%	17.78	221.8	24.21	-----
3	48	71432	Benzene (including benzene from gasoline)	77	8.6%	15.68	60.99	0.369	-----
4	99	100414	Ethyl benzene	55	6.2%	4.56	50.58	0.315	-----
5	109	5000	Formaldehyde	46	5.1%	4.98	28.82	11.99	-----
6	118	110543	Hexane	38	4.3%	3.02	31.46	4.009	-----
7	120	7647010	Hydrochloric acid	29	3.2%	-----	-----	0.474	28.21
8	174	127184	Tetrachloroethylene (Perchloroethylene)	20	2.3%	-----	-----	20.26	-----
9	35	75070	Acetaldehyde	14	1.5%	1.73	11.80	0.030	-----
10	133	78933	Methyl ethyl ketone (2-Butanone)	11	1.2%	-----	-----	10.92	-----

Table 3-2

Top 10 Source Types for Total Hazardous Air Pollutants in 1999
Anchorage, Fairbanks, and Juneau

Rank	Source Type	Source Category	Estimated Emissions - Tons Per Year			
			Total HAPs Emitted in Study Area		Highest Emitted HAP in Source Type	
Municipality of Anchorage						
1	Surface Coating	Area Sources	682	29%	Toluene	46%
2	Consumer Products	Area Sources	331	14%	Methanol	27%
3	Light Duty Gasoline Vehicles	On-Road Mobile Sources	270	12%	Toluene	35%
4	Aircraft	Off-Road Mobile Sources	220	9.4%	Formaldehyde	45%
5	Dry Cleaners	Area Sources	168	7.2%	Tetrachloroethylene	100%
6	Light Duty Gas Trucks (< 6000 lb)	On-Road Mobile Sources	112	4.8%	Toluene	35%
7	Entech	Point Sources	50	2.1%	Hydrochloric Acid	99%
8	Area Source Facilities	Area Sources	36	1.5%	Hexane	26%
9	Light Duty Gas Trucks (6-8500 lb)	On-Road Mobile Sources	32	1.4%	Toluene	35%
10	Residential Heating - NG	Area Sources	27	1.2%	Hexane	95%
Fairbanks North Star Borough						
1	Surface Coating	Area Sources	223	19%	Toluene	46%
2	Snowmobiles (2-st.)	Off-Road Mobile Sources	176	15%	Xylenes	37%
3	Fort Wainwright	Point Sources	145	13%	Hydrochloric Acid	82%
4	Consumer Products	Area Sources	107	9.3%	Methanol	27%
5	Light Duty Gasoline Vehicles	On-Road Mobile Sources	89	7.7%	Toluene	36%
6	Light Duty Gas Trucks (< 6000 lb)	On-Road Mobile Sources	70	6.1%	Toluene	37%
7	Residential Woodstoves	Area Sources	59	5.1%	Benzene	46%
8	Dry Cleaners	Area Sources	54	4.7%	Tetrachloroethylene	100%
9	U.A. Fairbanks	Point Sources	47	4.1%	Hydrochloric Acid	88%
10	Outboard (2-st.)	Off-Road Mobile Sources	45	3.9%	Xylenes	37%
City and Borough of Juneau						
1	Outboard (2-st.)	Off-Road Mobile Sources	255	28%	Xylenes	38%
2	Logging Equip. Chain Saws > 6 HP	Off-Road Mobile Sources	147	16%	Xylenes	39%
3	Personal Water Craft (2-st.)	Off-Road Mobile Sources	135	15%	Xylenes	38%
4	Surface Coating	Area Sources	80	8.9%	Toluene	46%
5	Light Duty Gasoline Vehicles	On-Road Mobile Sources	43	4.7%	Toluene	40%
6	Consumer Products	Area Sources	39	4.3%	Methanol	27%
7	U.S. Waste Services	Point Sources	28	3.1%	Hydrochloric Acid	99%
8	Dry Cleaners	Area Sources	20	2.2%	Tetrachloroethylene	100%
9	Light Duty Gas Trucks (< 6000 lb)	On-Road Mobile Sources	20	2.2%	Toluene	40%
10	Inboard/sterndrive	Off-Road Mobile Sources	15	1.7%	Toluene	31%

Table 3-3

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Municipality of Anchorage

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Anchorage TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
1	79345	1,1,2,2-Tetrachloroethane	0.010	-----	-----	0.010	-----
2	79005	1,1,2-Trichloroethane	-----	-----	-----	-----	-----
3	57147	1,1-Dimethyl hydrazine	-----	-----	-----	-----	-----
4	120821	1,2,4-Trichlorobenzene	-----	-----	-----	-----	-----
5	96128	1,2-Dibromo-3-chloropropane	0.003	-----	-----	0.003	-----
6	122667	1,2-Diphenylhydrazine	-----	-----	-----	-----	-----
7	106887	1,2-Epoxybutane	0.005	-----	-----	0.005	-----
8	75558	1,2-Propylenimine (2-Methyl aziridine)	-----	-----	-----	-----	-----
9	106990	1,3-Butadiene	22.32	4.776	14.62	2.925	-----
10	542756	1,3-Dichloropropene	20.62	-----	-----	20.62	-----
11	1120714	1,3-Propane sultone	0.000	-----	-----	0.000	-----
12	106467	1,4-Dichlorobenzene(p)	10.74	-----	-----	10.74	-----
13	123911	1,4-Dioxane (1,4-Diethyleneoxide)	0.001	-----	-----	0.001	-----
14	540841	2,24-Trimethylpentane	-----	-----	-----	-----	-----
15	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.000	0.000	-----	0.000	-----
16	95954	2,4,5-Trichlorophenol	-----	-----	-----	-----	-----
17	88062	2,4,6-Trichlorophenol	-----	-----	-----	-----	-----
18	94757	2,4-D, salts and esters	-----	-----	-----	-----	-----
19	51285	2,4-Dinitrophenol	-----	-----	-----	-----	-----
20	121142	2,4-Dinitrotoluene	-----	-----	-----	-----	-----
21	584849	2,4-Tolluene diisocyanate	-----	-----	-----	-----	-----
22	95807	2,4-Toluene diamine	-----	-----	-----	-----	-----
23	53963	2-Acetylaminofluorene	-----	-----	-----	-----	-----
24	532274	2-Chloroacetophenone	-----	-----	-----	-----	-----
25	79469	2-Nitropropane	0.000	-----	-----	0.000	-----
26	91941	3,3-Dichlorobenzidene	-----	-----	-----	-----	-----
27	119904	3,3-Dimethoxybenzidine	-----	-----	-----	-----	-----
28	119937	3,3-Dimethyl benzidine	-----	-----	-----	-----	-----
29	101144	4,4-Methylene bis (2-chloroaniline)	-----	-----	-----	-----	-----
30	101779	4,4'-Methylenedianiline	-----	-----	-----	-----	-----
31	534521	4,6-Dinitro-o-cresol, and salts	-----	-----	-----	-----	-----
32	92671	4-Aminobiphenyl	-----	-----	-----	-----	-----
33	92933	4-Nitrobiphenyl	-----	-----	-----	-----	-----
34	100027	4-Nitrophenol	-----	-----	-----	-----	-----
35	75070	Acetaldehyde	66.35	11.28	54.61	0.460	-----
36	60355	Acetamide	0.000	-----	-----	0.000	-----
37	75058	Acetonitrile	0.041	-----	-----	0.041	-----
38	98862	Acetophenone	0.001	-----	-----	0.001	-----
39	107028	Acrolein	20.68	1.140	18.47	1.068	-----
40	79061	Acrylamide	0.160	-----	-----	0.160	-----
41	79107	Acrylic Acid	0.000	-----	-----	0.000	-----
42	107131	Acrylonitrile	0.010	-----	-----	0.010	-----
43	107051	Allyl chloride	-----	-----	-----	-----	-----
44	62533	Aniline	-----	-----	-----	-----	-----
45	N/A	Antimony Compounds	0.031	-----	-----	0.012	0.019
46	N/A	Arsenic Compounds (inorganic including arsine)	0.134	0.000	0.000	0.133	0.000
47	1332214	Asbestos	-----	-----	-----	-----	-----
48	71432	Benzene (including benzene from gasoline)	185.7	119.4	59.05	7.187	-----
49	92875	Benzidine	-----	-----	-----	-----	-----
50	98077	Benzotricholoride	-----	-----	-----	-----	-----
51	100447	Benzyl chloride	0.007	-----	-----	0.007	-----

Table 3-3

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Municipality of Anchorage

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Anchorage TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
52	N/A	Beryllium Compounds	0.109	-----	-----	0.104	0.005
53	57578	beta-Propiolactone	-----	-----	-----	-----	-----
54	92524	Biphenyl	-----	-----	-----	-----	-----
55	117817	Bis(2-ethylhexyl)phthalate (DEHP)	-----	-----	-----	-----	-----
56	542881	Bis(chloromethyl)ether	-----	-----	-----	-----	-----
57	75252	Bromoform	0.000	-----	-----	0.000	-----
58	N/A	Cadmium Compouns	0.053	-----	-----	0.045	0.008
59	156627	Calcium cyanamide	-----	-----	-----	-----	-----
60	133062	Captan	-----	-----	-----	-----	-----
61	63252	Carbaryl	0.000	-----	-----	0.000	-----
62	75150	Carbon disulfide	-----	-----	-----	-----	-----
63	56235	Carbon tetrachloride	0.001	-----	-----	0.001	-----
64	463581	Carbonyl sufide	0.004	-----	-----	0.004	-----
65	120809	Catechol	-----	-----	-----	-----	-----
66	133904	Chloramben	-----	-----	-----	-----	-----
67	57749	Chlordane	-----	-----	-----	-----	-----
68	7782505	Chlorine	0.154	-----	-----	0.001	0.153
69	79118	Chloroacetic acid	0.005	-----	-----	0.005	-----
70	108907	Chlorobenzene	9.235	-----	-----	9.235	-----
71	510156	Chlorobenzilate	-----	-----	-----	-----	-----
72	67663	Chloroform	0.128	-----	-----	0.128	-----
73	107302	Chloromethyl methyl ether	-----	-----	-----	-----	-----
74	126998	Chloroprene	0.062	-----	-----	0.062	-----
75	N/A	Chromium Chompounds	0.103	0.006	0.016	0.079	0.001
76	N/A	Cobalt Compounds	0.012	-----	-----	0.012	-----
77	N/A	Coke Oven Emissions	-----	-----	-----	-----	-----
78	1319773	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
79	95487	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
80	108394	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
81	106445	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
82	98828	Cumene	0.010	-----	-----	0.010	-----
83	N/A	Cyanide Compounds	8.604	-----	-----	8.604	-----
84	3547044	DDE	0.000	-----	-----	0.000	-----
85	334883	Diazomethane	-----	-----	-----	-----	-----
86	132649	Dibenzofurans	0.001	-----	-----	0.001	-----
87	84742	Dibutylphthalate	-----	-----	-----	-----	-----
88	111444	Dichloroethyl ether (Bis[2-chloroethyl]ether)	-----	-----	-----	-----	-----
89	62737	Dichlorvos	-----	-----	-----	-----	-----
90	111422	Diethanolamine	-----	-----	-----	-----	-----
91	64675	Diethyl sulfate	-----	-----	-----	-----	-----
92	60117	Dimethyl aminoazobenzene	-----	-----	-----	-----	-----
93	79447	Dimethyl caramoyl chloride	-----	-----	-----	-----	-----
94	68122	Dimethyl formamide	0.032	-----	-----	0.032	-----
95	131113	Dimethyl phthalate	-----	-----	-----	-----	-----
96	77781	Dimethyl sulfate	-----	-----	-----	-----	-----
97	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	0.002	-----	-----	0.002	-----
98	140885	Ethyl acrylate	-----	-----	-----	-----	-----
99	100414	Ethyl benzene	50.08	21.60	25.15	3.333	-----
100	51796	Ethyl carbamate (Urethane)	-----	-----	-----	-----	-----
101	75003	Ethyl chloride (Chloroethane)	1.525	-----	-----	1.525	-----
102	1006934	Ethylene dibromide (Dibromoethane)	-----	-----	-----	-----	-----

Table 3-3

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Municipality of Anchorage

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Anchorage TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
103	107062	Ethylene dichloride (1,2-Dichloroethane)	0.001	-----	-----	0.001	-----
104	107211	Ethylene glycol	1.427	-----	-----	1.427	-----
105	151564	Ethylene imine (Axiridine)	-----	-----	-----	-----	-----
106	75218	Ethylene oxide	1.946	-----	-----	1.946	-----
107	96457	Ethylene thiourea	-----	-----	-----	-----	-----
108	75343	Ethylidene dichloride (1,1-Dichloroethane)	-----	-----	-----	-----	-----
109	5000	Formaldehyde	172.1	19.54	148.0	4.519	-----
110	N/A	Glycol ethers	5.219	-----	-----	5.219	-----
111	76448	Heptachlor	-----	-----	-----	-----	-----
112	118741	Hexachlorobenzene	-----	-----	-----	-----	-----
113	87683	Hexachlorobutadiene	-----	-----	-----	-----	-----
114	77474	Hexachlorocyclopentadiene	-----	-----	-----	-----	-----
115	67721	Hexachloroethane	-----	-----	-----	-----	-----
116	822060	Hexamethylene-1,6 diisocyanate	0.059	-----	-----	0.059	-----
117	680319	Hexamethylphosphoramide	-----	-----	-----	-----	-----
118	110543	Hexane	86.06	18.39	16.30	51.37	-----
119	302012	Hydrazine	-----	-----	-----	-----	-----
120	7647010	Hydrochloric acid	53.95	-----	-----	5.052	48.90
121	7664393	Hydrogen fluoride (Hydrofluoric acid)	0.411	-----	-----	0.193	0.218
122	123319	Hydroquinone	0.021	-----	-----	0.021	-----
123	78591	Isophorone	0.122	-----	-----	0.122	-----
124	N/A	Lead Compounds	15.086	0.011	14.95	0.020	0.106
125	58899	Lindane (all isomers)	-----	-----	-----	-----	-----
126	108316	Maleic anhydride	-----	-----	-----	-----	-----
127	N/A	Manganese Compounds	0.065	0.002	0.018	0.043	0.001
128	N/A	Mercury Compounds	0.229	0.000	0.004	0.068	0.156
129	67561	Methanol	89.97	-----	-----	89.968	-----
130	72435	Methoxychlor	-----	-----	-----	-----	-----
131	74839	Methyl bromide(Bromomethane)	28.62	-----	-----	28.617	-----
132	71556	Methyl chloroform (1,1,1-Trichloroethane)	50.21	-----	-----	50.207	-----
133	78933	Methyl ethyl ketone (2-Butanone)	94.03	-----	-----	94.032	-----
134	60344	Methyl hydrazine	-----	-----	-----	-----	-----
135	74884	Methyl iodide (Iodomethane)	-----	-----	-----	-----	-----
136	108101	Methyl isobutyl ketone (Hexone)	64.52	-----	-----	64.521	-----
137	624839	Methyl isocyanate	-----	-----	-----	-----	-----
138	80626	Methyl methacrylate	-----	-----	-----	-----	-----
139	1634044	Methyl tert butyl ether	0.042	-----	-----	0.042	-----
140	74873	Methylchloride (Chloromethane)	1.391	-----	-----	1.391	-----
141	75092	Methylene chloride(Dichloromethane)	22.02	-----	-----	22.015	-----
142	101688	Methylene diphenyl diisocyante (MDI)	0.058	-----	-----	0.058	-----
143	N/A	Mineral fibers	0.000	-----	-----	0.000	-----
144	121697	N,N-Diethyl anniline (N,N-Dimethylanine)	0.004	-----	-----	0.004	-----
145	91203	Naphthalene	6.324	-----	-----	6.324	-----
146	N/A	Nickel Compounds	0.073	0.005	0.008	0.060	0.001
147	98953	Nitrobenzene	-----	-----	-----	-----	-----
148	62759	N-Nitrosodimethylamine	-----	-----	-----	-----	-----
149	59892	N-Nitrosomorpholine	-----	-----	-----	-----	-----
150	684935	N-Nitroso-N-methylurea	-----	-----	-----	-----	-----
151	90040	o-Anisidine	0.038	-----	-----	0.038	-----
152	95534	o-Toluidine	-----	-----	-----	-----	-----
153	56382	Parathion	-----	-----	-----	-----	-----

Table 3-3

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Municipality of Anchorage

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Anchorage TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
154	82688	Pentachloromitrobenzene (Quintobenzene)	0.141	-----	-----	0.141	-----
155	87865	Pentachlorophenol	-----	-----	-----	-----	-----
156	108952	Phenol	0.000	-----	-----	0.000	-----
157	75445	Phosgene	-----	-----	-----	-----	-----
158	7723140	Phosphorus	0.001	-----	-----	0.001	-----
159	7803512	Phospine	-----	-----	-----	-----	-----
160	85449	Phthalic anhydride	-----	-----	-----	-----	-----
161	1336363	Polychlorinated biphenyls (Aroclors)	-----	-----	-----	-----	-----
162	N/A	Polycylic Organic Matter	1.366	0.021	0.087	1.258	0.000
163	106503	p-Phenylemediamine	3.710	-----	-----	3.710	-----
164	123386	Propionaldehyde	11.77	1.731	9.957	0.081	-----
165	114261	Propoxur(Baygon)	-----	-----	-----	-----	-----
166	78875	Propylene dichloride (1,2-Dichloropropane)	0.013	-----	-----	0.013	-----
167	75569	Propylene oxide	-----	-----	-----	-----	-----
168	91225	Quinoline	-----	-----	-----	-----	-----
169	106514	Quinone	0.019	-----	-----	0.019	-----
170	N/A	Radionuclides (including radon)	-----	-----	-----	-----	-----
171	N/A	Selenium Compounds	0.001	-----	-----	0.001	-----
172	100425	Styrene	8.488	4.437	4.051	-----	-----
173	96093	Styrene oxide	-----	-----	-----	-----	-----
174	127184	Tetrachloroethylene (Perchloroethylene)	172.0	-----	-----	172.0	-----
175	7550450	Titanium tetrachloride	-----	-----	-----	-----	-----
176	108883	Toluene	628.7	146.6	103.3	378.7	-----
177	8001352	Toxaphene (chlorinated camphene)	0.003	-----	-----	0.003	-----
178	79016	Trichloroethylene	0.252	-----	-----	0.252	-----
179	121448	Triethylamine	0.108	-----	-----	0.108	-----
180	1582098	Trifluralin	-----	-----	-----	-----	-----
181	108054	Vinyl acetate	0.295	-----	-----	0.295	-----
182	593602	Vinyl bromide	0.042	-----	-----	0.042	-----
183	75014	Vinyl chloride	0.016	-----	-----	0.016	-----
184	75354	Vinylidene chloride (1,1-Dichloroethylene)	0.016	-----	-----	0.016	-----
185	1330207	Xylenes (isomers and mixture)	391.0	82.5	99.2	209.2	-----
186	95476	Xylenes (isomers and mixture)	19.73	-----	-----	19.73	-----
187	108383	Xylenes (isomers and mixture)	0.010	-----	-----	0.010	-----
188	106423	Xylenes (isomers and mixture)	0.030	-----	-----	0.030	-----
		Total HAP Emissions (Tons per Year)	**2,329**	**432**	**568**	**1,280**	**50**

Table 3-4

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Fairbanks North Star Borough

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Fairbanks TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
1	79345	1,1,2,2-Tetrachloroethane	0.030	-----	-----	-----	0.030
2	79005	1,1,2-Trichloroethane	-----	-----	-----	-----	-----
3	57147	1,1-Dimethyl hydrazine	-----	-----	-----	-----	-----
4	120821	1,2,4-Trichlorobenzene	-----	-----	-----	-----	-----
5	96128	1,2-Dibromo-3-chloropropane	-----	-----	-----	-----	-----
6	122667	1,2-Diphenylhydrazine	-----	-----	-----	-----	-----
7	106887	1,2-Epoxybutane	-----	-----	-----	-----	-----
8	75558	1,2-Propylenimine (2-Methyl aziridine)	-----	-----	-----	-----	-----
9	106990	1,3-Butadiene	12.828	2.617	5.940	4.271	-----
10	542756	1,3-Dichloropropene	6.640	-----	-----	6.640	-----
11	1120714	1,3-Propane sultone	-----	-----	-----	-----	-----
12	106467	1,4-Dichlorobenzene(p)	3.449	-----	-----	3.449	-----
13	123911	1,4-Dioxane (1,4-Diethyleneoxide)	0.000	-----	-----	0.000	-----
14	540841	2,24-Trimethylpentane	0.612	-----	-----	0.612	-----
15	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.000	0.000	-----	0.000	-----
16	95954	2,4,5-Trichlorophenol	-----	-----	-----	-----	-----
17	88062	2,4,6-Trichlorophenol	-----	-----	-----	-----	-----
18	94757	2,4-D, salts and esters	-----	-----	-----	-----	-----
19	51285	2,4-Dinitrophenol	-----	-----	-----	-----	-----
20	121142	2,4-Dinitrotoluene	-----	-----	-----	-----	-----
21	584849	2,4-Tolluene diisocyanate	-----	-----	-----	-----	-----
22	95807	2,4-Toluene diamine	-----	-----	-----	-----	-----
23	53963	2-Acetylaminofluorene	-----	-----	-----	-----	-----
24	532274	2-Chloroacetophenone	-----	-----	-----	-----	-----
25	79469	2-Nitropropane	0.000	-----	-----	0.000	-----
26	91941	3,3-Dichlorobenzidene	-----	-----	-----	-----	-----
27	119904	3,3-Dimethoxybenzidine	-----	-----	-----	-----	-----
28	119937	3,3-Dimethyl benzidine	-----	-----	-----	-----	-----
29	101144	4,4-Methylene bis (2-chloroaniline)	-----	-----	-----	-----	-----
30	101779	4,4'-Methylenedianiline	-----	-----	-----	-----	-----
31	534521	4,6-Dinitro-o-cresol, and salts	-----	-----	-----	-----	-----
32	92671	4-Aminobiphenyl	-----	-----	-----	-----	-----
33	92933	4-Nitrobiphenyl	-----	-----	-----	-----	-----
34	100027	4-Nitrophenol	-----	-----	-----	-----	-----
35	75070	Acetaldehyde	25.953	3.606	22.12	0.227	-----
36	60355	Acetamide	0.000	-----	-----	0.000	-----
37	75058	Acetonitrile	-----	-----	-----	-----	-----
38	98862	Acetophenone	0.000	-----	-----	0.000	-----
39	107028	Acrolein	8.748	0.578	7.627	0.543	-----
40	79061	Acrylamide	-----	-----	-----	-----	-----
41	79107	Acrylic Acid	0.000	-----	-----	0.000	-----
42	107131	Acrylonitrile	0.050	-----	-----	-----	0.050
43	107051	Allyl chloride	-----	-----	-----	-----	-----
44	62533	Aniline	-----	-----	-----	-----	-----
45	N/A	Antimony Compounds	0.032	-----	-----	0.032	-----
46	N/A	Arsenic Compounds (inorganic including arsine)	1.258	0.000	0.000	0.028	1.230
47	1332214	Asbestos	-----	-----	-----	-----	-----
48	71432	Benzene (including benzene from gasoline)	107.42	49.62	26.53	31.02	0.250
49	92875	Benzidine	-----	-----	-----	-----	-----
50	98077	Benzotricholoride	-----	-----	-----	-----	-----
51	100447	Benzyl chloride	-----	-----	-----	-----	-----

Table 3-4

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Fairbanks North Star Borough

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Fairbanks TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
52	N/A	Beryllium Compounds	0.010	-----	-----	0.010	-----
53	57578	beta-Propiolactone	-----	-----	-----	-----	-----
54	92524	Biphenyl	-----	-----	-----	-----	-----
55	117817	Bis(2-ethylhexyl)phthalate (DEHP)	-----	-----	-----	-----	-----
56	542881	Bis(chloromethyl)ether	-----	-----	-----	-----	-----
57	75252	Bromoform	-----	-----	-----	-----	-----
58	N/A	Cadmium Compounds	0.150	-----	-----	0.050	0.100
59	156627	Calcium cyanamide	-----	-----	-----	-----	-----
60	133062	Captan	-----	-----	-----	-----	-----
61	63252	Carbaryl	-----	-----	-----	-----	-----
62	75150	Carbon disulfide	0.010	-----	-----	-----	0.010
63	56235	Carbon tetrachloride	0.010	-----	-----	0.000	0.010
64	463581	Carbonyl sufide	0.010	-----	-----	-----	0.010
65	120809	Catechol	-----	-----	-----	-----	-----
66	133904	Chloramben	-----	-----	-----	-----	-----
67	57749	Chlordane	-----	-----	-----	-----	-----
68	7782505	Chlorine	-----	-----	-----	-----	-----
69	79118	Chloroacetic acid	-----	-----	-----	-----	-----
70	108907	Chlorobenzene	3.322	-----	-----	2.972	0.350
71	510156	Chlorobenzilate	-----	-----	-----	-----	-----
72	67663	Chloroform	0.051	-----	-----	0.041	0.010
73	107302	Chloromethyl methyl ether	-----	-----	-----	-----	-----
74	126998	Chloroprene	-----	-----	-----	-----	-----
75	N/A	Chromium Chompounds	0.383	0.003	0.007	0.363	0.010
76	N/A	Cobalt Compounds	0.024	-----	-----	0.014	0.010
77	N/A	Coke Oven Emissions	-----	-----	-----	-----	-----
78	1319773	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
79	95487	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
80	108394	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
81	106445	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
82	98828	Cumene	0.600	-----	-----	0.220	0.380
83	N/A	Cyanide Compounds	1.449	-----	-----	1.449	-----
84	3547044	DDE	-----	-----	-----	-----	-----
85	334883	Diazomethane	-----	-----	-----	-----	-----
86	132649	Dibenzofurans	0.000	-----	-----	0.000	-----
87	84742	Dibutylphthalate	-----	-----	-----	-----	-----
88	111444	Dichloroethyl ether (Bis[2-chloroethyl]ether)	-----	-----	-----	-----	-----
89	62737	Dichlorvos	-----	-----	-----	-----	-----
90	111422	Diethanolamine	-----	-----	-----	-----	-----
91	64675	Diethyl sulfate	-----	-----	-----	-----	-----
92	60117	Dimethyl aminoazobenzene	-----	-----	-----	-----	-----
93	79447	Dimethyl caramoyl chloride	-----	-----	-----	-----	-----
94	68122	Dimethyl formamide	0.001	-----	-----	0.001	-----
95	131113	Dimethyl phthalate	-----	-----	-----	-----	-----
96	77781	Dimethyl sulfate	-----	-----	-----	-----	-----
97	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	-----	-----	-----	-----	-----
98	140885	Ethyl acrylate	-----	-----	-----	-----	-----
99	100414	Ethyl benzene	24.29	9.639	12.58	1.551	0.520
100	51796	Ethyl carbamate (Urethane)	-----	-----	-----	-----	-----
101	75003	Ethyl chloride (Chloroethane)	0.509	-----	-----	0.499	0.010
102	1006934	Ethylene dibromide (Dibromoethane)	-----	-----	-----	-----	-----

Table 3-4

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Fairbanks North Star Borough

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Fairbanks TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
103	107062	Ethylene dichloride (1,2-Dichloroethane)	0.010	-----	-----	0.000	0.010
104	107211	Ethylene glycol	0.467	-----	-----	0.467	-----
105	151564	Ethylene imine (Axiridine)	-----	-----	-----	-----	-----
106	75218	Ethylene oxide	0.627	-----	-----	0.627	-----
107	96457	Ethylene thiourea	-----	-----	-----	-----	-----
108	75343	Ethylidene dichloride (1,1-Dichloroethane)	0.030	-----	-----	-----	0.030
109	5000	Formaldehyde	103.92	10.18	59.95	33.37	0.420
110	N/A	Glycol ethers	1.680	-----	-----	1.680	-----
111	76448	Heptachlor	-----	-----	-----	-----	-----
112	118741	Hexachlorobenzene	-----	-----	-----	-----	-----
113	87683	Hexachlorobutadiene	-----	-----	-----	-----	-----
114	77474	Hexachlorocyclopentadiene	-----	-----	-----	-----	-----
115	67721	Hexachloroethane	-----	-----	-----	-----	-----
116	822060	Hexamethylene-1,6 diisocyanate	0.010	-----	-----	-----	0.010
117	680319	Hexamethylphosphoramide	-----	-----	-----	-----	-----
118	110543	Hexane	33.09	7.457	11.22	13.71	0.710
119	302012	Hydrazine	-----	-----	-----	-----	-----
120	7647010	Hydrochloric acid	161.1	-----	-----	1.104	160.0
121	7664393	Hydrogen fluoride (Hydrofluoric acid)	19.99	-----	-----	0.001	19.99
122	123319	Hydroquinone	-----	-----	-----	-----	-----
123	78591	Isophorone	0.039	-----	-----	0.039	-----
124	N/A	Lead Compounds	3.208	0.006	2.284	0.118	0.800
125	58899	Lindane (all isomers)	-----	-----	-----	-----	-----
126	108316	Maleic anhydride	-----	-----	-----	-----	-----
127	N/A	Manganese Compounds	0.791	0.001	0.008	0.782	-----
128	N/A	Mercury Compounds	0.038	0.000	0.002	0.026	0.010
129	67561	Methanol	28.96	-----	-----	28.95	0.010
130	72435	Methoxychlor	-----	-----	-----	-----	-----
131	74839	Methyl bromide(Bromomethane)	9.213	-----	-----	9.213	-----
132	71556	Methyl chloroform (1,1,1-Trichloroethane)	16.09	-----	-----	16.08	0.010
133	78933	Methyl ethyl ketone (2-Butanone)	34.85	-----	-----	34.46	0.390
134	60344	Methyl hydrazine	-----	-----	-----	-----	-----
135	74884	Methyl iodide (Iodomethane)	-----	-----	-----	-----	-----
136	108101	Methyl isobutyl ketone (Hexone)	20.94	-----	-----	20.88	0.060
137	624839	Methyl isocyanate	-----	-----	-----	-----	-----
138	80626	Methyl methacrylate	-----	-----	-----	-----	-----
139	1634044	Methyl tert butyl ether	0.001	-----	-----	0.001	-----
140	74873	Methylchloride (Chloromethane)	0.443	-----	-----	0.443	-----
141	75092	Methylene chloride(Dichloromethane)	8.573	-----	-----	8.403	0.170
142	101688	Methylene diphenyl diisocyante (MDI)	-----	-----	-----	-----	-----
143	N/A	Mineral fibers	-----	-----	-----	-----	-----
144	121697	N,N-Diethyl anniline (N,N-Dimethylanine)	-----	-----	-----	-----	-----
145	91203	Naphthalene	6.117	-----	-----	5.977	0.140
146	N/A	Nickel Compounds	1.803	0.002	0.004	1.797	-----
147	98953	Nitrobenzene	-----	-----	-----	-----	-----
148	62759	N-Nitrosodimethylamine	-----	-----	-----	-----	-----
149	59892	N-Nitrosomorpholine	-----	-----	-----	-----	-----
150	684935	N-Nitroso-N-methylurea	-----	-----	-----	-----	-----
151	90040	o-Anisidine	-----	-----	-----	-----	-----
152	95534	o-Toluidine	-----	-----	-----	-----	-----
153	56382	Parathion	-----	-----	-----	-----	-----

Table 3-4

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
Fairbanks North Star Borough

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Fairbanks TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
154	82688	Pentachloromitrobenzene (Quintobenzene)	-----	-----	-----	-----	-----
155	87865	Pentachlorophenol	-----	-----	-----	-----	-----
156	108952	Phenol	0.380	-----	-----	0.000	0.380
157	75445	Phosgene	-----	-----	-----	-----	-----
158	7723140	Phosphorus	0.431	-----	-----	0.431	-----
159	7803512	Phospine	-----	-----	-----	-----	-----
160	85449	Phthalic anhydride	-----	-----	-----	-----	-----
161	1336363	Polychlorinated biphenyls (Aroclors)	-----	-----	-----	-----	-----
162	N/A	Polycylic Organic Matter	10.33	0.010	0.035	10.283	-----
163	106503	p-Phenylemediamine	-----	-----	-----	-----	-----
164	123386	Propionaldehyde	4.975	0.909	4.065	0.001	-----
165	114261	Propoxur(Baygon)	-----	-----	-----	-----	-----
166	78875	Propylene dichloride (1,2-Dichloropropane)	0.010	-----	-----	-----	0.010
167	75569	Propylene oxide	-----	-----	-----	-----	-----
168	91225	Quinoline	-----	-----	-----	-----	-----
169	106514	Quinone	0.004	-----	-----	0.004	-----
170	N/A	Radionuclides (including radon)	-----	-----	-----	-----	-----
171	N/A	Selenium Compounds	0.008	-----	-----	0.008	-----
172	100425	Styrene	4.150	2.079	1.701	-----	0.370
173	96093	Styrene oxide	-----	-----	-----	-----	-----
174	127184	Tetrachloroethylene (Perchloroethylene)	55.21	-----	-----	55.12	0.090
175	7550450	Titanium tetrachloride	-----	-----	-----	-----	-----
176	108883	Toluene	258.6	65.80	52.89	137.6	2.340
177	8001352	Toxaphene (chlorinated camphene)	-----	-----	-----	-----	-----
178	79016	Trichloroethylene	0.070	-----	-----	0.020	0.050
179	121448	Triethylamine	0.035	-----	-----	0.035	-----
180	1582098	Trifluralin	-----	-----	-----	-----	-----
181	108054	Vinyl acetate	0.097	-----	-----	0.097	-----
182	593602	Vinyl bromide	-----	-----	-----	-----	-----
183	75014	Vinyl chloride	0.060	-----	-----	-----	0.060
184	75354	Vinylidene chloride (1,1-Dichloroethylene)	-----	-----	-----	-----	-----
185	1330207	Xylenes (isomers and mixture)	161.7	37.13	50.15	73.31	1.100
186	95476	Xylenes (isomers and mixture)	6.167	-----	-----	6.167	-----
187	108383	Xylenes (isomers and mixture)	0.000	-----	-----	0.0001	-----
188	106423	Xylenes (isomers and mixture)	0.000	-----	-----	0.0001	-----
		Total HAP Emissions (Tons per Year)	**1,152**	**190**	**257**	**515**	**190**

Table 3-5

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
City and Borough of Juneau

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Juneau TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
1	79345	1,1,2,2-Tetrachloroethane	-----	-----	-----	-----	-----
2	79005	1,1,2-Trichloroethane	-----	-----	-----	-----	-----
3	57147	1,1-Dimethyl hydrazine	-----	-----	-----	-----	-----
4	120821	1,2,4-Trichlorobenzene	-----	-----	-----	-----	-----
5	96128	1,2-Dibromo-3-chloropropane	0.000	-----	-----	0.000	-----
6	122667	1,2-Diphenylhydrazine	-----	-----	-----	-----	-----
7	106887	1,2-Epoxybutane	0.001	-----	-----	0.001	-----
8	75558	1,2-Propylenimine (2-Methyl aziridine)	-----	-----	-----	-----	-----
9	106990	1,3-Butadiene	8.023	1.502	6.520	-----	-----
10	542756	1,3-Dichloropropene	2.440	-----	-----	2.440	-----
11	1120714	1,3-Propane sultone	-----	-----	-----	-----	-----
12	106467	1,4-Dichlorobenzene(p)	1.267	-----	-----	1.267	-----
13	123911	1,4-Dioxane (1,4-Diethyleneoxide)	0.000	-----	-----	0.000	-----
14	540841	2,24-Trimethylpentane	0.095	-----	-----	0.095	-----
15	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.000	0.000	-----	0.000	0.000
16	95954	2,4,5-Trichlorophenol	-----	-----	-----	-----	-----
17	88062	2,4,6-Trichlorophenol	-----	-----	-----	-----	-----
18	94757	2,4-D, salts and esters	-----	-----	-----	-----	-----
19	51285	2,4-Dinitrophenol	-----	-----	-----	-----	-----
20	121142	2,4-Dinitrotoluene	-----	-----	-----	-----	-----
21	584849	2,4-Tolluene diisocyanate	-----	-----	-----	-----	-----
22	95807	2,4-Toluene diamine	-----	-----	-----	-----	-----
23	53963	2-Acetylaminofluorene	-----	-----	-----	-----	-----
24	532274	2-Chloroacetophenone	-----	-----	-----	-----	-----
25	79469	2-Nitropropane	0.000	-----	-----	0.000	-----
26	91941	3,3-Dichlorobenzidene	-----	-----	-----	-----	-----
27	119904	3,3-Dimethoxybenzidine	-----	-----	-----	-----	-----
28	119937	3,3-Dimethyl benzidine	-----	-----	-----	-----	-----
29	101144	4,4-Methylene bis (2-chloroaniline)	-----	-----	-----	-----	-----
30	101779	4,4'-Methylenedianiline	-----	-----	-----	-----	-----
31	534521	4,6-Dinitro-o-cresol, and salts	-----	-----	-----	-----	-----
32	92671	4-Aminobiphenyl	-----	-----	-----	-----	-----
33	92933	4-Nitrobiphenyl	-----	-----	-----	-----	-----
34	100027	4-Nitrophenol	-----	-----	-----	-----	-----
35	75070	Acetaldehyde	13.559	1.731	11.80	0.030	-----
36	60355	Acetamide	0.000	-----	-----	0.000	-----
37	75058	Acetonitrile	-----	-----	-----	-----	-----
38	98862	Acetophenone	0.000	-----	-----	0.000	-----
39	107028	Acrolein	3.755	0.292	3.338	0.125	-----
40	79061	Acrylamide	0.023	-----	-----	0.023	-----
41	79107	Acrylic Acid	0.000	-----	-----	0.000	-----
42	107131	Acrylonitrile	-----	-----	-----	-----	-----
43	107051	Allyl chloride	-----	-----	-----	-----	-----
44	62533	Aniline	-----	-----	-----	-----	-----
45	N/A	Antimony Compounds	0.000	-----	-----	0.000	-----
46	N/A	Arsenic Compounds (inorganic including arsine)	0.032	0.000	-----	0.023	0.009
47	1332214	Asbestos	-----	-----	-----	-----	-----
48	71432	Benzene (including benzene from gasoline)	77.04	15.68	60.99	0.369	-----
49	92875	Benzidine	-----	-----	-----	-----	-----
50	98077	Benzotricholoride	-----	-----	-----	-----	-----
51	100447	Benzyl chloride	0.001	-----	-----	0.001	-----

Table 3-5

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
City and Borough of Juneau

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Juneau TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
52	N/A	Beryllium Compounds	0.017	-----	-----	0.017	-----
53	57578	beta-Propiolactone	-----	-----	-----	-----	-----
54	92524	Biphenyl	-----	-----	-----	-----	-----
55	117817	Bis(2-ethylhexyl)phthalate (DEHP)	-----	-----	-----	-----	-----
56	542881	Bis(chloromethyl)ether	-----	-----	-----	-----	-----
57	75252	Bromoform	-----	-----	-----	-----	-----
58	N/A	Cadmium Compounds	0.047	-----	-----	0.016	0.032
59	156627	Calcium cyanamide	-----	-----	-----	-----	-----
60	133062	Captan	-----	-----	-----	-----	-----
61	63252	Carbaryl	0.000	-----	-----	0.000	-----
62	75150	Carbon disulfide	-----	-----	-----	-----	-----
63	56235	Carbon tetrachloride	0.000	-----	-----	0.000	-----
64	463581	Carbonyl sufide	-----	-----	-----	-----	-----
65	120809	Catechol	-----	-----	-----	-----	-----
66	133904	Chloramben	-----	-----	-----	-----	-----
67	57749	Chlordane	-----	-----	-----	-----	-----
68	7782505	Chlorine	-----	-----	-----	-----	-----
69	79118	Chloroacetic acid	0.001	-----	-----	0.001	-----
70	108907	Chlorobenzene	1.092	-----	-----	1.092	-----
71	510156	Chlorobenzilate	-----	-----	-----	-----	-----
72	67663	Chloroform	0.015	-----	-----	0.015	-----
73	107302	Chloromethyl methyl ether	-----	-----	-----	-----	-----
74	126998	Chloroprene	-----	-----	-----	-----	-----
75	N/A	Chromium Chompounds	0.150	0.001	0.009	0.097	0.043
76	N/A	Cobalt Compounds	0.000	-----	-----	0.000	-----
77	N/A	Coke Oven Emissions	-----	-----	-----	-----	-----
78	1319773	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
79	95487	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
80	108394	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
81	106445	Cresols/Creshlic acid (isomers and mixture)	-----	-----	-----	-----	-----
82	98828	Cumene	-----	-----	-----	-----	-----
83	N/A	Cyanide Compounds	1.046	-----	-----	1.046	-----
84	3547044	DDE	0.000	-----	-----	0.000	-----
85	334883	Diazomethane	-----	-----	-----	-----	-----
86	132649	Dibenzofurans	0.000	-----	-----	0.000	-----
87	84742	Dibutylphthalate	-----	-----	-----	-----	-----
88	111444	Dichloroethyl ether (Bis[2-chloroethyl]ether)	-----	-----	-----	-----	-----
89	62737	Dichlorvos	-----	-----	-----	-----	-----
90	111422	Diethanolamine	-----	-----	-----	-----	-----
91	64675	Diethyl sulfate	-----	-----	-----	-----	-----
92	60117	Dimethyl aminoazobenzene	-----	-----	-----	-----	-----
93	79447	Dimethyl caramoyl chloride	-----	-----	-----	-----	-----
94	68122	Dimethyl formamide	0.001	-----	-----	0.001	-----
95	131113	Dimethyl phthalate	-----	-----	-----	-----	-----
96	77781	Dimethyl sulfate	-----	-----	-----	-----	-----
97	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	-----	-----	-----	-----	-----
98	140885	Ethyl acrylate	-----	-----	-----	-----	-----
99	100414	Ethyl benzene	55.45	4.556	50.58	0.315	-----
100	51796	Ethyl carbamate (Urethane)	-----	-----	-----	-----	-----
101	75003	Ethyl chloride (Chloroethane)	0.179	-----	-----	0.179	-----
102	1006934	Ethylene dibromide (Dibromoethane)	-----	-----	-----	-----	-----

Table 3-5

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
City and Borough of Juneau

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Juneau TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
103	107062	Ethylene dichloride (1,2-Dichloroethane)	0.000	-----	-----	0.000	-----
104	107211	Ethylene glycol	0.167	-----	-----	0.167	-----
105	151564	Ethylene imine (Axiridine)	-----	-----	-----	-----	-----
106	75218	Ethylene oxide	0.230	-----	-----	0.230	-----
107	96457	Ethylene thiourea	-----	-----	-----	-----	-----
108	75343	Ethylidene dichloride (1,1-Dichloroethane)	-----	-----	-----	-----	-----
109	5000	Formaldehyde	45.66	4.978	28.82	11.86	-----
110	N/A	Glycol ethers	0.626	-----	-----	0.626	-----
111	76448	Heptachlor	-----	-----	-----	-----	-----
112	118741	Hexachlorobenzene	-----	-----	-----	-----	-----
113	87683	Hexachlorobutadiene	-----	-----	-----	-----	-----
114	77474	Hexachlorocyclopentadiene	-----	-----	-----	-----	-----
115	67721	Hexachloroethane	-----	-----	-----	-----	-----
116	822060	Hexamethylene-1,6 diisocyanate	-----	-----	-----	-----	-----
117	680319	Hexamethylphosphoramide	-----	-----	-----	-----	-----
118	110543	Hexane	38.45	3.016	31.46	3.980	-----
119	302012	Hydrazine	-----	-----	-----	-----	-----
120	7647010	Hydrochloric acid	28.68	-----	-----	0.474	28.208
121	7664393	Hydrogen fluoride (Hydrofluoric acid)	0.000	-----	-----	0.000	-----
122	123319	Hydroquinone	-----	-----	-----	-----	-----
123	78591	Isophorone	0.014	-----	-----	0.014	-----
124	N/A	Lead Compounds	4.104	0.002	4.089	0.012	-----
125	58899	Lindane (all isomers)	-----	-----	-----	-----	-----
126	108316	Maleic anhydride	-----	-----	-----	-----	-----
127	N/A	Manganese Compounds	0.039	0.000	0.015	0.023	-----
128	N/A	Mercury Compounds	0.087	0.000	0.002	0.012	0.073
129	67561	Methanol	10.64	-----	-----	10.640	-----
130	72435	Methoxychlor	-----	-----	-----	-----	-----
131	74839	Methyl bromide(Bromomethane)	3.386	-----	-----	3.386	-----
132	71556	Methyl chloroform (1,1,1-Trichloroethane)	5.908	-----	-----	5.908	-----
133	78933	Methyl ethyl ketone (2-Butanone)	10.922	-----	-----	10.922	-----
134	60344	Methyl hydrazine	-----	-----	-----	-----	-----
135	74884	Methyl iodide (Iodomethane)	-----	-----	-----	-----	-----
136	108101	Methyl isobutyl ketone (Hexone)	7.475	-----	-----	7.475	-----
137	624839	Methyl isocyanate	-----	-----	-----	-----	-----
138	80626	Methyl methacrylate	-----	-----	-----	-----	-----
139	1634044	Methyl tert butyl ether	0.001	-----	-----	0.001	-----
140	74873	Methylchloride (Chloromethane)	0.164	-----	-----	0.164	-----
141	75092	Methylene chloride(Dichloromethane)	2.145	-----	-----	2.145	-----
142	101688	Methylene diphenyl diisocyante (MDI)	0.008	-----	-----	0.008	-----
143	N/A	Mineral fibers	0.000	-----	-----	0.000	-----
144	121697	N,N-Diethyl anniline (N,N-Dimethylanine)	-----	-----	-----	-----	-----
145	91203	Naphthalene	0.732	-----	-----	0.732	-----
146	N/A	Nickel Compounds	0.116	0.001	0.009	0.034	0.072
147	98953	Nitrobenzene	-----	-----	-----	-----	-----
148	62759	N-Nitrosodimethylamine	-----	-----	-----	-----	-----
149	59892	N-Nitrosomorpholine	-----	-----	-----	-----	-----
150	684935	N-Nitroso-N-methylurea	-----	-----	-----	-----	-----
151	90040	o-Anisidine	0.006	-----	-----	0.006	-----
152	95534	o-Toluidine	-----	-----	-----	-----	-----
153	56382	Parathion	-----	-----	-----	-----	-----

Table 3-5

Summary of Estimated 1999 Hazardous Air Pollutant Emissions - All Sources
City and Borough of Juneau

Section 112 Hazardous Air Pollutants			Estimated Emissions - Tons per Year				
No.	CAS No.	Chemical Name	Juneau TOTAL	On-Road Mobile Sources	Off-Road Mobile Sources	Area Sources	Point Sources
154	82688	Pentachloromitrobenzene (Quintobenzene)	0.020	-----	-----	0.020	-----
155	87865	Pentachlorophenol	-----	-----	-----	-----	-----
156	108952	Phenol	-----	-----	-----	-----	-----
157	75445	Phosgene	-----	-----	-----	-----	-----
158	7723140	Phosphorus	0.002	-----	-----	0.002	-----
159	7803512	Phospine	-----	-----	-----	-----	-----
160	85449	Phthalic anhydride	-----	-----	-----	-----	-----
161	1336363	Polychlorinated biphenyls (Aroclors)	-----	-----	-----	-----	-----
162	N/A	Polycylic Organic Matter	0.116	0.005	0.042	0.070	-----
163	106503	p-Phenylemediamine	-----	-----	-----	-----	-----
164	123386	Propionaldehyde	2.350	0.294	2.056	0.000	-----
165	114261	Propoxur(Baygon)	-----	-----	-----	-----	-----
166	78875	Propylene dichloride (1,2-Dichloropropane)	-----	-----	-----	-----	-----
167	75569	Propylene oxide	-----	-----	-----	-----	-----
168	91225	Quinoline	-----	-----	-----	-----	-----
169	106514	Quinone	0.002	-----	-----	0.002	-----
170	N/A	Radionuclides (including radon)	-----	-----	-----	-----	-----
171	N/A	Selenium Compounds	0.000	-----	-----	0.000	-----
172	100425	Styrene	4.168	0.971	3.197	-----	-----
173	96093	Styrene oxide	-----	-----	-----	-----	-----
174	127184	Tetrachloroethylene (Perchloroethylene)	20.26	-----	-----	20.26	-----
175	7550450	Titanium tetrachloride	-----	-----	-----	-----	-----
176	108883	Toluene	283.6	31.51	208.6	43.53	-----
177	8001352	Toxaphene (chlorinated camphene)	0.000	-----	-----	0.000	-----
178	79016	Trichloroethylene	0.007	-----	-----	0.007	-----
179	121448	Triethylamine	0.013	-----	-----	0.013	-----
180	1582098	Trifluralin	-----	-----	-----	-----	-----
181	108054	Vinyl acetate	0.035	-----	-----	0.035	-----
182	593602	Vinyl bromide	0.006	-----	-----	0.006	-----
183	75014	Vinyl chloride	0.001	-----	-----	0.001	-----
184	75354	Vinylidene chloride (1,1-Dichloroethylene)	0.001	-----	-----	0.001	-----
185	1330207	Xylenes (isomers and mixture)	263.8	17.78	221.8	24.21	-----
186	95476	Xylenes (isomers and mixture)	2.212	-----	-----	2.212	-----
187	108383	Xylenes (isomers and mixture)	0.005	-----	-----	0.005	-----
188	106423	Xylenes (isomers and mixture)	0.008	-----	-----	0.008	-----
		Total HAP Emissions (Tons per Year)	**900**	**82**	**633**	**156**	**28**