ALASKA TOP HAZARDOUS AIR POLLUTANTS

ACROLEIN

#3	Non Cancer Endpoint

Reference Concentration

- Acrolein - 0.00002 mg/m^3 (0.000008 ppm) for scaling and hardening of, and infiltration of white blood cells (a response to injury) into, the skin within the nose - rats

Inventory Estimates of Acrolein

Community	Ranking by Mass	Total Emitted (tons per year)*	Top Sources
Anchorage	17 of 71	20.68	Commercial, turbine powered aircraft, gasoline powered equipment, structural fires
Fairbanks	18 of 58	8.748	Commercial, turbine powered aircraft, gasoline powered equipment, refineries
Juneau	17 of 52	3.755	Commercial, turbine powered aircraft, gasoline powered equipment, structural fires
Total of 3 Communities		33.18	

* The mass emission rates are based on input data that may or may not be accurate. The reader should not consider the inventory accurate to three decimal places (one thousandth of a ton). The use of three decimal places allows us to acknowledge small quantities of pollutants rather than showing the emission rate as zero.

Acrolein Sources Expected in Alaska

vehicles	locomotives	Non-road sources like chainsaws, snow blowers, snowmobiles, outboards, and personal watercraft
boats and ships	structural fires	asphalt plants and paving

power generators	seafood processing	airports
military bases	hospitals	mines
refineries	wastewater facilities	

Potential Occupational Exposure to Acrolein

manufacture of acrylic acid	rubber production	welding
coking plants	diesel mechanics	

Acrolein Emission Inventory Improvements

- Update emission factors for locomotives
- Update emission factors for asphalt plants and paving, and structural fires
- Update emission factors for the Anchorage International Airport

Acrolein Health Effects

Low level (<0.1 ppm [<0.25 mg/m^3]): 0.1 ppm is the OSHA limit for 8 hours, exposures to this level or lower should minimize, though not prevent, irritation to all exposed individuals.

Medium level (0.1 - 1 ppm [0.25 - 2.3 mg/m^3]): Eye irritation noticeable at 0.2 ppm. Odor threshold is between 0.33 and 0.40 ppm. Respiratory response begins around 0.62 ppm.

High level (1 - 3 ppm [2.3 - 7mg/m^3]): Tearing with eye, nose, and throat irritation. Irritation of upper respiratory tract.

Very high levels (3 ppm [>7 mg/m^3]): Injury to lung after short term exposures. An exposure to 350 mg/m^3 was fatal after ten minutes.

NOTE: Acrolein is in cigarette smoke.

Cancer ranking: The EPA classifies acrolein as a group C carcinogen for adrenal gland cancer in rats. Group C carcinogens are considered possible human carcinogens where there is no human data and limited animal data of its cancer causing properties.