

## ALASKA TOP HAZARDOUS AIR POLLUTANTS

# NICKEL COMPOUNDS

#5	<u>Non Cancer Endpoint</u>
#4	<u>Minimum Risk Level</u>

### Reference Concentration (from the California Environmental Protection Agency)

- Nickel Compounds - 0.00005 mg/m<sup>3</sup> for respiratory and immune system effects - rats

### Minimum Risk Level

- Nickel Compounds - 0.0002 mg/m<sup>3</sup> for respiratory effects of nickel salt - rats

### Inventory Estimates of Nickel Compounds

Community	Ranking by Mass	Total Emitted (tons per year)*	Top Sources
Anchorage	47 of 71	0.073	residential heating with natural gas, military
Fairbanks	28 of 58	1.803	power generation
Juneau	33 of 52	0.116	incineration, residential heating with oil
Total of 3 Communities		0.888	

\* 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.

### Nickel Compound Sources Expected in Alaska

vehicles	locomotives	boats and ships
non-road sources like chainsaws, snow blowers, snowmobiles, outboards,	asphalt plants	residential woodstoves

and personal watercraft		
residential heating-oil and natural gas	seafood processing	airports
hospitals	power generators	military bases
refineries	open burning	mines
waste incineration		

### Potential Occupational Exposure to Nickel Compounds

mining	nickel refining	nickel smelting
nickel electroplating	use of nickel catalysts	welding nickel alloys
battery manufacturing	glass bottle mold production	using nickel containing paints
recycling of nickel products		

### Nickel Compound Emission Inventory Improvements

- Update emission factors for locomotives and barges
- Update emission factors for asphalt plants and paving, residential heating with oil, and used oil combustion
- Update emission factors for area source and point source facilities

### Nickel Compound Health Effects

There is not enough human data to determine ranges of exposure and effect. The lowest observed adverse effect levels in animals studies range from 80 mg/m<sup>3</sup> for developmental effects in rats for nickel carbonyl to 0.02 mg/m<sup>3</sup> for general toxicity in rats from nickel sulfate hexahydrate.

**Cancer ranking:** Like many metals, nickel exists in different chemical states which have differing toxicities to humans. The EPA classifies nickel refinery dust and nickel subsulfide as Group A carcinogens for lung and nasal cancers. Group A carcinogens are considered known human carcinogen, like cigarette smoke or benzene. EPA has classified nickel carbonyl as a Group B2, a probable human carcinogen.