

Introduction

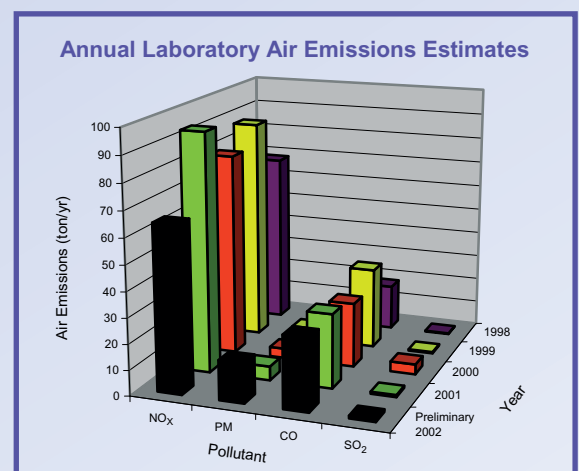
Air-pollutant emissions from Los Alamos National Laboratory (the Laboratory) come primarily from industrial sources such as boilers used for heating and power that support the research and development activities of the Laboratory. Air pollutants are characterized as either criteria pollutants or hazardous air pollutants. Criteria pollutants are nitrogen oxides, carbon monoxide, sulfur dioxide, particulate matter less than 10 microns in size, volatile organic compounds, and lead.

Hazardous air pollutants consist of a list of 188 compounds or classes of compounds which are listed in Section 112 of the federal Clean Air Act Amendments of 1990. Past emissions of nitrogen oxide from the Laboratory have been the highest of any criteria pollutant. Nitrogen oxide emissions estimates were 93.8 tons per year for 2001 and 64.6 tons per year for 2002. The largest source of nitrogen oxide emissions is the combustion of natural gas in boilers at the Technical Area 3 power plant. The Laboratory has voluntarily installed a nitrogen-oxide control system at the power plant that became operational in the fall of 2002 and will reduce future nitrogen oxide emissions by approximately 70%. In 2001, total emissions of all hazardous air pollutants from chemical usage at the Laboratory were conservatively estimated to be 7.4 tons per year.

Title V of the federal Clean Air Act Amendments of 1990 requires facilities defined as "major stationary sources" to obtain a Title V operating permit. Because the Laboratory has the potential to emit more than 100 tons of nitrogen oxide, carbon monoxide, and volatile organic compounds per year, the Laboratory is considered to be a major source of emissions. The intent of the Title V permit program is to enhance compliance by including, in a single permit, all existing air quality construction permit conditions as well as state and federal air quality regulatory requirements. The Laboratory submitted an initial Title V permit application to the New Mexico Environment Department in 1995. An updated application was submitted in November 2002, and it is under review at this time by the New Mexico Environment Department. The application is comprehensive and contains for each permitted emission source a process description, emission estimates, all applicable air quality requirements, and proposed means of monitoring, recordkeeping, and reporting. The application also requests new facility-wide emission limits for criteria pollutant and hazardous air pollutant emissions.

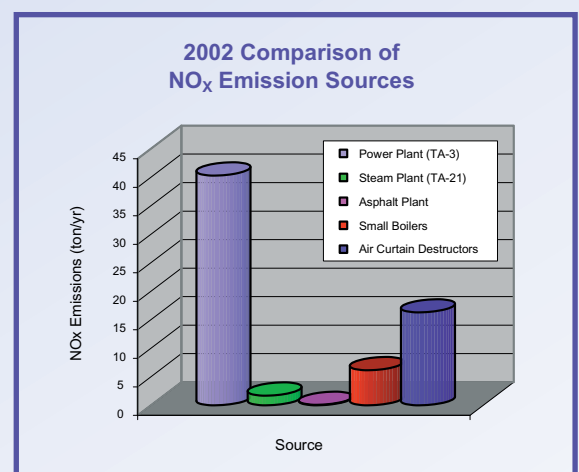
Air Emissions Estimates from the Laboratory

- ❖ Air pollutant emissions are typically assessed and described in terms of criteria pollutants and hazardous air pollutants.
- ❖ Criteria pollutants are those for which a National Ambient Air Quality Standard has been established by the U.S. Environmental Protection Agency. These are nitrogen oxides, carbon monoxide, sulfur dioxide, particulate matter less than 10 microns in size, and volatile organic compounds that are regulated as ozone precursors. Lead is also a criteria pollutant primarily due to mobile-source concerns.
- ❖ Hazardous air pollutants consist of a list of 188 compounds or classes of compounds that are listed in Section 112 of the federal Clean Air Act Amendments of 1990.
- ❖ The Laboratory prepares an annual assessment of air emissions called the emissions inventory that it submits to the New Mexico Environment Department. The inventory describes "actual emissions" of criteria pollutants and hazardous air pollutants from the significant industrial sources at the Laboratory. Actual emissions are calculated based on a unit's hours of operation or fuel consumption over the period of time of one year. Hazardous air pollutants and volatile organic compound emissions are also estimated from chemical usage in research and development activities. The inventory reports exclude the small sources considered insignificant by the New Mexico Environment Department.
- ❖ As reported to the New Mexico Environment Department, past actual emissions of criteria pollutants have been below the Title V major-source threshold of 100 tons per year. In that regard, the Laboratory air emissions are significantly less than emissions from other Title V sources.



Nitrogen Oxide Emissions From the Laboratory

- ❖ Nitrogen oxide emissions are consistently the highest pollutant emitted. In 2002, preliminary actual emissions estimates of nitrogen oxide were 64.6 tons per year. The pollutant emitted in the second-highest quantity was carbon monoxide at 28.2 tons per year.
- ❖ Nitrogen oxide is emitted from the combustion of fuel at the Laboratory. The largest source of nitrogen oxide is the combustion of natural gas at the Technical Area 3 power plant, even though natural gas is considered the cleanest fuel available for boiler operation.
- ❖ It is anticipated that nitrogen oxide emissions will begin to significantly decrease as a result of the Flue Gas Recirculation system on the three large boilers at the Technical Area 3 power plant that the Laboratory voluntarily installed. This air-pollution control system became operational in October 2002 and will reduce nitrogen oxide emissions by approximately 70%.



Acronym List

CAAA	Clean Air Act Amendments	NESHAP	National Emission Standard for Hazardous Air Pollutants
CO	carbon monoxide	NMAC	New Mexico Administrative Code
D&D	decontamination and decommissioning	NMED	New Mexico Environment Department
EPA	Environmental Protection Agency	NO _x	nitrogen oxide
HAP	hazardous air pollutant	NSPS	New Source Performance Standard
HEPA	high-efficiency particulate air	HVAC	heating, ventilation, and air conditioning
HVAC	heating, ventilation, and air conditioning	Pb	lead
the Laboratory	Los Alamos National Laboratory	PM	particulate matter
MMBtu	million British Thermal Units	PM ₁₀	particulate matter less than 10 microns
MMcf	million cubic feet	SO ₂	sulfur dioxide (also: "SO _x ")
MMscf	million standard cubic feet		
NAAQS	National Ambient Air Quality Standard		

