

C.3 IN CANADA

Data have been developed on historical long-term trends for Canadian sulphur dioxide and nitrogen oxide emissions (1,2). Information on production and fuel consumption on a provincial basis was obtained from other federal government departments for the various sectors investigated. Supplemental data such as the names of specific plants operating in 1955 and 1965 were obtained from internal files and various provincial agencies. For area type sources, where necessary, census information specific to the earlier time periods was used. In many cases, emission factors were applied to the basic data derived from these information sources. The factors used were either from U.S. EPA's data (3), the same factors adapted to Canadian conditions, or Canadian factors developed by Environment Canada. Generally, the methodology adopted for developing emissions for the earlier years closely followed that now being utilized for current emissions (4), except that actual emission data extracted from plant files were utilized for all copper-nickel smelter complexes (2), and for some power generating plants (1).

The years 1955, 1965, and 1976 were chosen to give a fair representation of the trends in emissions over the past three decades. The data for 1955 and 1965 were developed on a national, provincial, and census division basis for all of Canada and for those sectors which, as a whole, are thought to contribute more than 90 percent of total emissions of SO_2 and NO_x . The data for 1976 have been developed in many formats - nationally, provincially, on a census division basis, on a 127 km x 127 km grid basis, and on a major metropolitan area basis - and cover the full spectrum of point and area types of emission sources (more than 70 sectors of the Canadian economy).

Total Canadian emissions of SO_2 and NO_x for each of the years 1955, 1965, and 1976 are presented in Table C.3.1 for the sectors of most concern at this time. Table C.3.2 presents the same information but for eastern Canada only. Total SO_2 emissions in Canada in 1976 were approximately 5.4 million tonnes, compared with 6.2 million tonnes in 1965 and 4.4 million tonnes in 1955. This fluctuation was largely due to significant changes in the emissions from the copper-nickel smelting industry which represented 65%, 62%, and 47% of total SO_2 emissions in the years 1955, 1965, and 1976 respectively. Eastern Canada has always contributed the larger portion of national emissions, this share being about 96%, 87%, and 83% in the years 1955, 1965, and 1976. All copper-nickel smelting complexes are located in eastern Canada (including Manitoba).

Emissions of SO_2 from power plants were at a negligible level of less than 0.1 million tonnes in 1955 before increasing to 0.2 million tonnes in 1965 and