3. CONTROL STRATEGY

3.1 INTRODUCTION

Section 420.12 Control Strategy: General. of the Requirements for Preparation, Adoption, and Submittal of Implementation Plans requires that in any air quality control region where existing (measure or estimated) ambient levels of a pollutant exceed the levels specified by an applicable national ambient air quality standard, the State Implementation Plan shall set forth a control strategy which shall provide for the degree of emission reduction necessary for attainment and maintenance of such national standard, including the degree of emission reduction necessary to offset emission increases that can reasonably be expected to result from projected growth of population, industrial activity, motor vehicle traffic, or other factors that may cause or contribute to increase emissions. It also requires that in any air quality control region where measured or estimated ambient levels of a pollutant are below the levels specified by an applicable secondary standard, the State Implementation Plan shall set forth a control strategy which shall be adequate to prevent such ambient pollution levels from exceeding such secondary standards.

Specific requirements of the State Implementation Plan for sulfur oxides and particulate matter are specified in Section 420.13 Control Strategy: Sulfur Oxides and Particulate Matter. and for carbon monoxide, hydrocarbons, photochemical oxidants, and nitrogen dioxide in Section 420.13 Control Strategy: Carbon Monoxide, Hydrocarbons, Photochemical Oxidants, and Nitrogen Dioxides. of the Requirements for Preparation, Adoption, and Submittal of Implementation Plans.

The air quality control regions within the State of North Dakota, Region No. 130 and Region No. 172, have both been classified Priority II for particulate matter and Priority III for sulfur oxides, carbon monoxide, photochemical oxidants, and nitrogen dioxide. These classifications and the basis for the classifications are presented in Table 1 of the Introduction, Section 1. The basis for the classifications presented in Table 1 will be discussed in detail in this section.

Control strategy will be developed for (1) particulate matter, (2) sulfur oxides, and (3) carbon monoxide, hydrocarbons, photochemical oxidants and nitrogen dioxide. The three control strategies developed will apply equally to both air quality control regions, Region No. 130 and Region No. 172, in North Dakota.

Estimated emission inventory data for North Dakota which is presented in this section and in Appendix E was obtained from the Statewide Emission Inventory of North Dakota by Raymond D. Fox and Billy C. McCoy, the GCA Corporation, GCA Technology Division, Bedford, Massachusetts, 01730. This inventory was prepared by the GCA Corporation for the Office of Air Programs, Environmental Protection Agency, under contract No. 68-02-0041. The methodology used to develop the emission inventory was that of the Office of Air Programs, Environmental Protection Agency. The emission inventory document contains a detailed description of the methodology used, and describes all major assumptions and information sources. The emission

inventory data presented in this section and in Appendix E summarizes the data in the Statewide Emission Inventory of North Dakota. The complete inventory has been retained in the offices of the State Department of Health, State Capitol, Bismarck and will be made available for inspection by the Administrator of the Environmental Protection Agency.

Estimated emission inventory data for the Clay County, Minnesota portion of Region No. 130 was obtained from the State of Minnesota Pollution Control Agency, Minneapolis, Minnesota. The methodology used was similar to that used in the North Dakota inventory.

It should be noted that the computer programs, which handled the emission inventory source data, and the emissions summary tables on which the reduced data was presented, were based on fuels most commonly used throughout the nation. Hence, the only coal types shown in the summary tables and the computer printouts in this section and in Appendix E are anthracite and bituminous. However, North Dakota has enormous reserves of low-sulfur lignite coal, and coal-burning installations use this fuel almost exclusively. As a consequence, all references to coal use in the tables in this section and Appendix E imply lignite coal.

Air quality data for North Dakota presented in this section was obtained from the air quality surveillance system operated by the State Department of Health. This system is described in detail in Section 6 of the Implementation Plan.

Air quality data for Moorhead, Minnesota was obtained from the State of Minnesota Pollution Control Agency.

Control strategies must consider emission increases that can reasonably be expected to result from projected growth of population, industrial activity, motor vehicle traffic, or other factors that may cause or contribute to increase emissions. To obtain the expected 1975 emissions achieved for particulate matter and sulfur oxides presented in Tables 5, 6, and 7, the following economic growth factors were used:

Emissions Inventory Source Category	Economic Growth Category	1970-1975 Growth Factor
I. Fuel Combustion		
A. Total Residential	Population	+ 4.9%
B. Total Industrial	Total Manufacturing	+ 15.7%
C. Total Utilities	Utilities	0 %
II. Total Process Losses	Total Manufacturing	+ 15.7%
III. Total Solid Waste Disposal	Population	+ 4.9%
IV. Transportation		
A. Motor Vehicle	Requirements for Preparation, Adoption, and Submittal of Implementa- Plans, Appendix I	+ 21.9%
B. Other	Transportation	+ 17.2%

These factors were obtained through the Environmental Protection Agency from Economic Projections for Air Quality Control Regions prepared by U.S. Department of Commerce with the exception of the factor for total utilities which was estimated from information obtained from local sources. These factors were applied statewide to both Region No. 130 and Region No. 172.

3.2 CONTROL STRATEGY: PARTICULATE MATTER

The two air quality control regions in North Dakota, Region No. 130 and Region No. 172, have both been classified Priority II with respect to particulate matter. The basis for these classifications was measured air quality. Measured air quality for suspended particulate matter obtained during calendar year 1970 by high-volume samplers at two sampling sites in Region No. 130 and at nine sampling sites in Region No. 172 is presented in Table 3. The maximum 24-hour concentration of 378 micrograms per cubic meter shown for the Moorhead sampling site was not considered in determining the classification for Region No. 130 as it apparently occurred during a period of abnormally high wind conditions. The next highest 24-hour concentration measured in Region No. 130 was 313 micrograms per cubic meter which also was measured at the Moorhead sampling site.

For purposes of developing the control strategy for particulate matter, the air quality at the non-urban Foxholm sampling site, located in rural Ward County in Region No. 172, will be used for the background concentrations in both Region No. 130 and Region No. 172. The annual geometric mean was 19 micrograms per cubic meter and the maximum 24-hour concentration was 49 micrograms per cubic meter at the Foxholm sampling site.

In both Region No. 130 and Region No. 172 the measured air quality for suspended particulate matter during 1970 was greater than the national secondary ambient air quality standards. Therefore, reductions of particulate emissions are necessary to improve the air quality for attainment and maintenance of the national secondary standards. The degree of improvement in air quality needed for attainment of the national secondary standards will be calculated by use of the proportional model.

Region No. 130

In Region No. 130, the highest measured air quality occurred at the Moorhead sampling site. The annual geometric mean was 71 micrograms per cubic meter and the maximum 24-hour concentration was 378 micrograms per cubic meter. The degree of improvement of air quality needed for attainment of the national secondary standards in Region No. 130 is as follows:

(1) Annual geometric mean

$$\frac{71 - 60}{71 - 19} \ (100) = 21.2 \text{ percent reduction needed.}$$

(2) Maximum 24-hour concentration

$$\frac{378 - 150}{378 - 49} \ (100) = 69.4 \text{ percent reduction needed.}$$