EVE 402
Air Pollution Generation and Control

Homework #2
Due: Friday, 6 September, 2019

1. Discuss why NAAQS are more advantageous than relying upon the individual states to establish air quality standards.

2. The SO_2 level of one section of a state is much below the NAAQS. A large electric utility has proposed to build a coal-burning plant in the region without any SO_2 control equipment. It has been determined that even with the discharge from the proposed plant, the SO_2 level in the region will still be below the NAAQS. Discuss the current regulations that would be applicable. Could the plant be built without controls under the current regulatory requirements? Discuss.

3. It has been suggested that the only way of achieving the proposed air quality standards in some cities is to prohibit the use of private automobiles in certain areas. Discuss the ramifications of this proposal.

4. A sulfuric acid manufacturing plant operates such that 50 U.S. short tons of acid are produced with an estimated emission of 75 lb of acid mist. Based on emission standards for new sources, should control equipment be considered and, if so, what percent removal efficiency is required of the control equipment?

5. A power plant elects to burn coal with a sulfur content of (a) 4.25% and (b) 2.78 % by weight. The heating value of the fuel is 11,300 Btu/lb. If the plant is to meet the current emission standard for new plants, what percent SO_2 removal from the stack gases is required? See Table 2-3.

6. A power plant burns 200 U.S. short tons per day of coal containing 3% sulfur. (a) Calculate the rate of emission of SO_2 [g/s] from the power plant's stack. (b) If the volume flow rate of flue gas containing the SO_2 is 250,000 m^3/hr at 150° C and 1.1 bar, and the molar mass of the gas is 28.5, determine the concentration [ppm] of SO_2 in the flue gas.