Considerable effort has been devoted to the development of chemical reaction mechanisms that are capable of describing the processes observed in smog chambers.[4-8] Smog chambers have been used extensively to determine how concentrations of NO_x and other photochemical products respond to changes in the initial composition of nitrogen oxides and organics. A previous Criteria Document[27] discusses smog chamber evidence concerning the relationship between ozone/oxidant and the photochemical precursors. This section focuses on how NO_2 concentrations respond to changes in the input levels of organics and nitrogen oxides.

Several researchers have used smog chambers to investigate the dependence of nitrogen dioxide concentrations on the levels of precursor inputs:

- The University of North Carolina (UNC) study using an 11,000 cubic-foot (311 m^3) outdoor Teflon chamber, a simulated urban hydrocarbon mix, and twelve-hour irradiations[32]
- The Bureau of Mines study, using a 100 cubic-foot (2.8 m^3) aluminum-glass chamber, auto-exhaust hydrocarbons, and six-hour irradiations [33,34]
- The General Motors study, using a 300 cubic-foot (8.5 m^3) stainless steel-glass chamber, a simulated Los Angeles hydrocarbon mix, and six-hour irradiations[35]
- The Health, Education and Welfare (HEW) study using a