

EXHIBIT NO. 1

Question 7 – Experimentation Description

- a. The proposed program involves collecting real-time observations of the lower atmosphere (surface to approximately 3 kilometers) using a vertically pointing radar beam and associated acoustic sounders. The radar, known as a “boundary layer profiler,” uses a phased-array planar antenna with electrically switched delays to point it $\pm 21^\circ$ off zenith in orthogonal planes. Differences in returned signals allow computation of the horizontal winds. Combined with acoustic signal information, virtual temperature through the lower atmosphere can be calculated. The wind data and the characteristics of these other data – and their changes in time – are indicative of the depth of the well-mixed lower atmosphere, which is a critical factor in determining vulnerability to air pollution episodes.
- b. By knowing the boundary layer characteristics, the Division of Air Quality can identify air pollution probability – and in conjunction with the US Environmental Protection Agency (EPA) guidelines and air quality programs (<http://www.epa.gov/airnow>) -- and issue forecasts intended to protect public health and mitigate air quality deterioration. In addition, archived data sets collected from this site will be used to design future air quality regulatory strategies the State of North Carolina will use to comply with Federally mandated air quality standards.
- c. The continued development of a boundary layer profiler capability in the eastern United States (<http://oak.fsl.noaa.gov/blp/displays/blpus.html>) holds great promise as a tool for further understanding of atmospheric phenomena impacting air quality as well as general meteorological applications.