

Federal Communications Commission, Form 442

Exhibit No. 1

(Reference for Item No. 7)

Prepared by: Maryland Department of the Environment

The Maryland Department of the Environment (MDE) is a partner in a cooperative agreement with the Environmental Protection Agency (EPA) to use wind profiling technology to better understand the transport of air quality pollutants such as ground-level ozone. This instrument is a "boundary layer radar wind profiler" and depends on the scattering of a transmitted signal by irregularities in the index of refraction of the air. The irregularities are caused by turbulent eddies created by the wind. By receiving the scattered signal and determining the Doppler frequency, the speed of the wind can be determined. Temperature data can also be obtained by measuring the velocity of propagation of an acoustic signal in the axis of the vertical radar beam.

This meteorological instrument is comprised of the following subsystems: an antenna subsystem consisting of a vertically-looking, high-performance, low-sidelobe antenna, whereby transmissions occur within 25 degrees or less boresight-offset from zenith; a transmitter subsystem utilizing a solid-state commercial pulsed radar transmitter, frequency controlled by fixed crystal, capable of unmodulated and phase-modulated pulses; a specialized low-noise receiver subsystem having matched filtering capability; a signal processing subsystem performing target parameter extraction and identification, and a data processing/communication subsystem for charting, recording, and long-line transmission of results. The antenna and transmitter subsystems are designed to maximize interoperability among co-located systems.

The FCC experimental license will be used in support of other wind profiling radar equipment in the Mid-Atlantic states, put in place by the NARSTO-NE group in the summer of 1997. The license will also be used to support airplane flights by the University of Maryland at College Park that measure ozone on poor ambient air quality days in the summer and to monitor ground-level air quality conditions as measured by MDE at air monitoring sites throughout Maryland. The objective of the study is to obtain a clearer understanding of ozone and other air quality pollutants in the upper atmosphere and to fulfill a federal mandate to measure surface level air quality pollutants and operate a wind profiler.