

FINAL PROJECT REPORT

**Feasibility of Exposure Assessment
For The Pilgrim Nuclear Power Plant**

Prepared for
The Massachusetts Department of Public Health

by

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1 Summary of Findings

1. The sea breeze phenomena is observed at the Pilgrim site. While a sea breeze can occur throughout the year it occurs most frequently during the spring and summer months. On average, Pilgrim I. experiences about 45 sea breeze days during these two seasons. Typically, the onshore component commences about 10 AM and can persist to about 4 PM. The wind direction changes during the day veering from the north around through the southeast quadrant by late afternoon. The intensity of a sea breeze can be measured by the wind speed and distance of inland penetration. The intensity of a sea breeze circulation depends upon solar radiation (which is influenced by cloud cover), sea water temperature, and strength of the gradient wind flow. The intensity and effective inland penetration of the sea breeze front in the near environment of the Pilgrim site are not well characterized.

2. Coast line orientation and topography strongly influence wind patterns (the frequency, direction, and strength of onshore winds). Predominantly, in the summer and spring, a sea breeze on-shore component is observed along the Massachusetts coast. The dominant sea breeze components are east and east-southeast for Boston-Logan, easterly for Plymouth, northeast and east-northeast for the Canal site, and east and east-southeast for the Pilgrim Plant. This finding suggests that the wind speed and direction at one coastal site should not be used as a surrogate for other coastal sites.

3. The meteorological sites available provide limited ability to fully characterize or model the sea breeze circulation in the vicinity of the Pilgrim I Nuclear Power Plant.

Existing sites have limited value because the length of record is insufficient to fully characterize the extent of sea breeze occurrence in the 1974/1975 time period.

Physical modeling of coastal sea breeze circulation patterns is limited by both the number of meteorological monitoring sites in the vicinity of the Pilgrim Plant and the number of parameters monitored.

2 Comments on the Cobb Wind Theory

There are three observations that appear consistent with Dr. Cobb's theory. First, leukemia rates are elevated in towns to the west and north of the Pilgrim I Plant. Second, recorded emissions were higher during the 1974

