

THE “SEA-BREEZE” OR LAKE-BREEZE EFFECT AND IMPACT ON POLLUTION CONCENTRATIONS/DISPERSIONS FROM SOURCES SUCH AS AIRPORTS”

Key Points {Follows logically after the press release history.}

Ref: The earlier report “INVESTIGATION OF THE CANCER INCIDENCE RATES IN THE VICINITY OF O’HARE AIRPORT”, 3/21/02.

*We previously said that in addition to the obvious “downwind” condition, that the existence of Lake Michigan would create air circulation “blocking” conditions that would result in trapping of pollutants between the airport and the coastline, thus increasing their concentrations and further contributing to the higher cancer incidence rates.

Please refer to Figure 2, page 4 of the report.

* The phenomena of the “Lake-Breeze Effect”, is due to the temperature differential between the colder lake water and the hotter, solar heated land surface. The rising hot air over the land causes a (denser) cool airflow in from the lake (the “cooler near the lake” condition), which can penetrate inland tens of miles.

*The incoming cool air eventually moves upward, due to heating, at the frontal zone, carrying pollutants arriving at the front, with it, such as those arriving from O’Hare Airport on a southwesterly breeze.

*This polluted air is returned back toward the coast and then, unfortunately, is recirculate back inland, rather than continuing on out over the lake toward Michigan.

*The net result is that the pollutants get trapped in this circulation zone and continuously increase in concentration as the day goes on, worsened further by photochemical pollutant reactions (for example, the ozone cycle).

*The analysis concludes that it is possible to experience pollutant concentration increases near 20:1. **{See figure 6, page 13}**

- >The degree of concentration is relatively independent of the prevailing wind speed.
- >The degree of concentration is greater for smaller inland advances of the front.
- >Concentrations can be quite high right near the coast.

*In a worse case scenario of high solar heating and calm winds over a period of days, the trapped pollution can continue to increase in concentration over this entire period.

*The study also examines the effect that Coriolis forces can have on pollutant-carrying winds.....tends to shift trapped pollutants southward.

*The study additionally considers how these phenomena can affect pollution level readings at pollution monitoring sites in the area.....pollutants can be diverted away. {For example, a strong Lake-Breeze effect can divert pollutants, carried on a southwest wind, away from the Northbrook monitoring station. **Ref. area map page 17.**}
