

2-2-73

UNITED STATES OF AMERICA  
ATOMIC ENERGY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
WISCONSIN PUBLIC SERVICE CORPORATION	)	
WISCONSIN POWER AND LIGHT COMPANY	)	Docket No. 50-305
AND	)	
MADISON GAS AND ELECTRIC COMPANY	)	
	)	
(Kewaunee Nuclear Power Plant)	)	

AFFIDAVIT IN SUPPORT OF  
MOTION FOR SUMMARY DISPOSITION

State of Maryland )  
) ss  
County of Montgomery)

The undersigned, E. W. Daniels, being first duly sworn, hereby deposes and says as follows:

1. A statement of by background and qualifications has been filed and is a part of the Docket in this matter .

2. Contentions 6.2a; 6.4.2.

The thermal plume is described in the FES, p. V-17 and V-18, and its general effects as well as effects on phytoplankton and zooplanton are discussed. (FES, p. V-19 and 20.)

Warmed water from the Kewaunee Plant will tend to float and dissipate rather rapidly. The addition of heat from a nuclear power plant is a readily reversible process, and it is localized; the added heat from the effluent is lost to the atmosphere, and the water returns to ambient.

Dr. Lee, an expert on algal growth and eutrophication, gave his reasons and said that he does not expect the thermal discharge at Point Beach to affect the total numbers of algae, nor does he anticipate a shift in algal type. (Testimony by Dr. Lee of Point Beach Hearings, July, 1972, pages 4-8.)

The upper temperature limit of the Kewaunee effluent is restricted to 86°F, and the normal summertime discharge temperature will be about 70° to 80°F. (FES, P. V-18 and 28.) At 75°F, many diatoms and also green algae grow well. Diatoms are dominant in the Kewaunee Plant area. (FES, P. II-43.) Relatively low populations of green- and blue-green algae grow in the Kewaunee area due to natural conditions in Lake Michigan, and waste heat from the Kewaunee Plant will not change these conditions in any important manner. (Radiological Physics Div., Ann. Rept. for 1971; Argonne Nat'l. Lab., Part III, ANL-7860, pp. 109-117.) The blue-greens generally grow best in oligotrophic waters, such as those at Kewaunee, between about 95°F

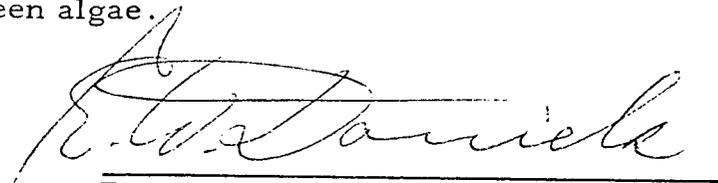
and 104°F. (J. Cairns, Jr., *Industrial Wastes*, 1 (4): 150-152, 1956.) It should be stressed that in the main, Lake Michigan is not eutrophic. On the contrary, it is a fairly nutrient deficient lake, and it is oligotrophic (low in nutrients) in the Kewaunee Plant region (FES, pp. II-21-II-24), and in the nearby Point Beach area. (Radiol. Physics Div., Ann. Rept. for 1971; Argonne Nat'l Lab., Part III, ANL-7860, pp. 103-108.)

Upon occasion, the phytoplankton populations present in various parts of Lake Michigan naturally bloom and then fade away. The concept of limiting factors explains this natural phenomenon. For example, the decline in silicon concentration in the lake water limits diatom growth. Diatoms are a major part of the phytoplankton. Silicon decline is aggravated by nutrient input which results in a temporary increase in diatom growth. When the diatoms bloom, available silicon may be used up. It is highly speculative to assume that in a few years the quantity of silicon available in the Lake Michigan water will be too low to support diatom growth. The addition of biologically available silicon to the lake from streams and rivers counteracts the decline of this element, and to a large extent explains the abundance of diatoms in the inshore waters. At the present time, the diatoms are still dominant among phytoplankton in the lake throughout most if not all of the year in the Kewaunee Plant region.

According to the Argonne National Laboratory study at Point Beach there have been no noxious algal blooms caused by the plumes. (ANL-7860, Part III, p. 109; Radiological Physics Div. 1971 Ann. Rept.) Dr. Ayers likewise observed no noxious blooms of bacteria or algae in or near the Point Beach plume. (Point Beach Hearings, July, 1972, pp. 10-12.)

Dr. Ayers also stated in general, that his studies of actual thermal discharges into the real environment of Lake Michigan do not demonstrate any adverse effects upon the lake's aquatic ecology.

Thus, significant problems with blue-green algae have not been induced in the Point Beach thermal plume, and are not anticipated at the Kewaunee site. Changes in phytoplankton species composition in the Kewaunee Plant region are largely due to natural ecological successions, and the addition of nutrients from agricultural, domestic, and industrial runoff, and there has been some enrichment from sewage. In my opinion, the Kewaunee thermal plume will not bring about excess growth of blue-green algae.

  
E. W. Daniels

Subscribed to and sworn before  
me this 2nd day of February, 1973

  
My Commission expires 1/1/76