April 17, 2012

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	
THE DETROIT EDISON COMPANY	)	Docket No. 52-033-COL
	)	
(Fermi Nuclear Power Plant, Unit 3)	)	

STATEMENT OF MATERIAL FACTS
ON WHICH NO GENUINE DISPUTE EXISTS

The Detroit Edison Company submits, in support of its motion for summary disposition of Contention 6, this statement of material facts as to which Detroit Edison contends that there is no genuine issue to be heard.

1. The Detroit Edison Company filed the combined license ("COL") application for Fermi Unit 3 on September 18, 2008. The application included an Environmental Report ("ER") and a Final Safety Analysis Report ("FSAR").

2. Proposed Contention 6 alleged that "[t]he COLA omits critical information disclosing environmental impacts to Lake Erie's Western Basin and Maumee River/Maumee Bay."

3. In its Memorandum and Order dated July 31, 2009, the Licensing Board admitted a portion of Contention 6. LBP-09-16, 70 NRC __, slip op. at 25. The Board admitted Contention 6 based on the adequacy of the ER's assessment of the potential for algal growth as a result of the proposed chemical discharge (*i.e.*, phosphorus) combined with thermal pollution expected during operation of Fermi Unit 3. LBP-09-16 at 51. In particular, the Licensing Board pointed to the proposed use of phosphoric acid as a corrosion inhibitor at Fermi Unit 3, which would ultimately be discharged into Lake Erie. *Id*. at 53. The Board explained that the ER "is devoid of an analysis on the potential for these chemical and thermal discharges to foster algal production in the vicinity of the proposed Fermi Unit 3." LBP-09-16 at 53-54. The Board also admitted the portion of Contention 6 related to the omission of information on a new algae, *Lyngbya wollei*, from the ER. *Id*. at 51.

4. In a letter dated February 15, 2010, the Detroit Edison Company responded to an NRC Staff request for additional information ("RAI") regarding the impacts of Fermi Unit 3 on algae production, including *Lyngbya wollei*, in Lake Erie. Letter to NRC Document Control Desk from Peter W. Smith, Director, Nuclear Development – Licensing and Engineering, Detroit Edison Company, NRC3-10-0005, "Detroit Edison Company Response to NRC Requests for Additional Information Letter No. 2 Related to the

Environmental Review" (ADAMS Accession No. ML100541329). NRC3-10-0005 included revised content for the Fermi 3 COL application.

5. In NRC3-10-0005, Attachment 2, at 4, Detroit Edison stated that it would not use the phosphorus-containing corrosion and scale inhibitors originally proposed for use in Fermi 3's cooling system and instead would use treatment chemicals that do not contain phosphorus or nitrogen compounds. These changes were reflected in revisions to Table 3.3-1, "Chemical Additives for Water Treatment," Table 3.6-1, "Chemicals Added to Liquid Effluent Streams," and Table 3.6-2, "Effluent Chemical Constituents."

6. The NRC Staff published the Draft Environmental Impact Statement ("DEIS") for Fermi 3 (NUREG-2105) in October 2011. The DEIS contains detailed discussion of the ecology of *Lyngbya wollei* and assesses the potential for Fermi 3 effluent to contribute to the proliferation of *Lyngbya* or other nuisance algae.

7. Operation of Fermi 3 will not result in any mass addition of calcium to Lake Erie. Fermi 3 will withdraw all of the intake water from Lake Erie and will discharge all of its effluents into Lake Erie. Lake Erie water naturally contains calcium. Because Fermi 3 will operate on approximately two cycles of concentration, the concentrations of calcium in Fermi 3 effluent are approximately twice that in the intake water. All calcium discharged from Fermi 3 originated in Lake Erie and Fermi 3 will not alter the calcium in the intake chemically or physically in a manner that would cause adverse water quality impacts.

8. Calcium addition and its role in stimulation of *Lyngbya wollei* biomass and toxicity was cited by the Intervenors as a potential negative impact of the Fermi 3 discharge. But, Lake Erie is located in a basin of limestone and dolomite, both calcium-rich minerals, and already retains relatively high concentrations of calcium.

9. Because the mass of total calcium will not increase, and because there will be no statistical increase in total calcium concentration in Lake Erie as a result of Fermi 3 operations, no adverse water quality impacts are anticipated from Fermi 3 operations.

10. In issuing the National Pollutant Discharge Elimination System ("NPDES") permit to Fermi 3, the State of Michigan, through the Michigan Department of Environmental Quality ("MDEQ"), confirmed that operation of Fermi 3 will not cause algal blooms or otherwise lead to adverse impacts. Permitted discharges must not stimulate growths of aquatic rooted, attached, suspended, and floating plants, fungi or bacteria which are or may become injurious to the designated uses of the surface waters of the State (*e.g.*, Lake Erie). Further, the dissolved solids (*e.g.*, calcium) in plant effluents must not exceed concentrations which are or may become injurious to any designated use in Lake Erie.

11. The Western Basin of Lake Erie receives significant inflow from the Maumee River that drains agro-ecosystems to the west. These nutrient-rich waters likely contribute to the *Lyngbya wollei* proliferations in the Maumee Bay area. In contrast, water at the Fermi site is largely from less nutrient-rich Great Lakes sources to the north. Historic water quality information for Maumee Bay and recent water quality information for Lake Erie

near the Fermi site show that levels of nutrients such as nitrate, orthophosphate, and total phosphorus reported from Maumee Bay are substantially higher than those reported for the Fermi site. And, phosphorus, a nutrient of concern in stimulation of algal proliferation, will also not be added to discharge waters of Fermi 3. The Fermi 3 discharge does not result in a mass addition of either of the primary nutrients affecting *Lyngbya* proliferation in Lake Erie (nitrogen and phosphorus).

12. Local lake conditions also affect the potential for algal growth. *Lyngbya* is intolerant of wave action and turbulent water. The sites with the greatest densities of *Lyngbya wollei* are in areas more sheltered from wave action. The conditions at the Fermi discharge sites are more turbulent than the *Lyngbya*-rich sites in Maumee Bay location due to the combined effects of wind on lake currents and wave action. Instead of *Lyngbya wollei*, the benthic algal communities at the Fermi site are dominated by small diatoms typical of healthy sandy lake bottoms that are adapted to resist turbulent flow. *Lyngbya wollei* proliferation or other algal blooms are less likely at the Fermi site than at other locations in Lake Erie due to prevailing lake conditions.

13. The Intervenors questioned the estimated size of the Fermi Unit 3 thermal plume in August. The Intervenors posited a thermal plume magnitude of about 75 acre-feet (per day). According to the Intervenors, a discharge of 17,000 gpm x 60 min. x 24 hrs. = 24,480,000 gal. per day / 325,851 gal./acre = 75.127 ac.-ft/day. This "calculation" does not incorporate a number of key parameters associated with thermal discharges. The formula is simply the <u>total volume</u> of water discharged. It does not take into account any dilution — it makes no provision for mixing (buoyancy, momentum), no provision for lake currents, and does not take into account the temperature of the receiving water body.

14. The Fermi 3 discharge was specifically designed to provide for rapid mixing. The turbulent mixing at the discharge location reduces locally increased water temperatures or chemical concentrations from the diffuser. Even under the worst case conditions, the plumes for Fermi 2 and Fermi 3 are not expected to overlap. The impact of the diffusers on benthic algal communities will be minimal because diffusers discharge water <u>upward</u> and at a <u>high velocity</u>. Mixing occurs quickly and elevated concentrations of chemicals or temperatures are unlikely to occur on the lakebed. As a result, the chemical and thermal discharges from Fermi 3 are not expected to cause or exacerbate algal blooms, including *Lyngbya wollei*.

15. Recent literature on the distribution of *Lyngbya wollei* in western Lake Erie note the initial reports of *Lyngbya* in 2006 and subsequent surveys in 2008 of the distribution and density of *Lyngbya* in Lake Erie's western basin. The surveys included shoreline areas from Stony Point along Michigan's shoreline to Camp Perry, the eastern most site sampled along Ohio's shoreline. The surveys report decreasing populations of the alga further north along the Michigan shoreline and further east along the Ohio shoreline. The closest record of occurrence of *Lyngbya* is in the vicinity of Sterling State Park, approximately five miles south-southwest of the Fermi site. *Lyngbya* was not found in samples at Stony Point, which is approximately two miles southwest of the Fermi site.

16. *Lyngbya* also was not found at the Fermi site. Based on observations of divers over a period of years at sampling sites and security buoys near Fermi 2 and algal sampling performed at the existing Fermi 2 outfall and the proposed Fermi 3 outfall location, *Lyngbya wollei* has not been found at the Fermi site.

17. Detroit Edison's research vessel and SCUBA dive team has provided sampling services for the Fermi 2 environmental monitoring program since the plant began operations. The program requires sediment sampling twice per year (in spring and the fall) and three sites are sampled each time. The same team is responsible for security buoy deployment and maintenance, which occurs at depths where *Lyngbya* is known to occur. In addition to providing details of boat and diving activities, if pertinent, the ship and dive logs also note meteorological and limnological conditions (*e.g.*, water clarity, bottom sediment, and biota). These logs were reviewed to determine if any changes in algae and other aquatic plants in the vicinity of the Fermi 2 had been noted as far back as 2006 (when *Lyngbya* was discovered in Maumee Bay). The logs contained no notations regarding algal mats. The divers also were asked if they had ever encountered any benthic algae similar to *Lyngbya* (*i.e.*, filamentous) near the Fermi 2 facility. Based on visual (naked eye) observations, which are adequate to identify *Lyngbya* or other algae when growing at nuisance levels, they did not observe such algae in the vicinity of Fermi 2.

18. In September 2011, benthic algae were collected at two sites: the proposed Fermi 3 discharge and the existing Fermi 2 discharge point. Ten replicate samples were collected at each site and analyzed microscopically at the Algal Ecology Laboratory at Bowling Green State University. The sediment surface had a distinct golden-brown hue characteristic of a healthy diatom-dominated algal community and microscopic analyses of the algal communities confirmed that they were heavily dominated by diatoms. The results indicate the presence of a typical and *healthy* assemblage of a benthic algal community. There was no evidence of the presence or proliferation of large benthic microalgae such as *Lyngbya* or *Cladophora* at either location.

19. Dredging in Lake Erie would result in the temporary loss of benthic organisms because of the disturbance of substrate and physical impacts on individuals, as well as short-term localized declines in phytoplankton productivity and zooplankton density due to increased turbidity. However, these effects would be temporary, easily mitigated, and minor. Similar dredging activities related to Fermi 2 operations have not caused algal blooms.

20. Controls to protect water quality in Lake Erie from Fermi 3 construction and operation will include the NPDES stormwater construction permit, the stormwater management plan for the Fermi site, and the employment of best management practices ("BMPs"). In addition, suspended sediments resulting from outfall construction in Lake Erie will be contained by a floating turbidity curtain. The chemical and physical discharges from construction activities will not affect the density and distribution of aquatic nuisance species, including *Lyngbya*, in Lake Erie.

21. In the DEIS the NRC Staff considered the effects of nutrients, temperature, substrate, and turbidity on algal blooms and examined the history of algal blooms associated with the

discharge for Fermi 2. The NRC specifically evaluated the potential for algal blooms caused by species such as *Cladophora spp.*, which is an attached green alga, *Microcystis spp.*, *Anabaena spp.*, *Aphanisomenon spp.*, and more recently, *Lyngbya*.

22. The principal contributor to the development of algal blooms is increased nutrient levels (especially phosphorus concentrations) resulting from changes in land use practices, altered hydrology, and food web changes. Fermi 3 will not increase the concentration of phosphorus, nitrogen, or calcium in Lake Erie. And, relative to the area near Maumee Bay, the levels of nitrate, orthophosphate, and total phosphorus in Lake Erie are substantially lower at the Fermi site. The DEIS also reports that no significant algal blooms have been reported in the vicinity of the discharge from Fermi 2, which has been operating commercially since 1988.

23. The DEIS considers the possibility that thermal discharge from Fermi 3 could affect the frequency of algal blooms, including *Lyngbya*, at the Fermi site. Because Fermi 3 would use a closed cycle cooling system, which is considered Best Available Technology ("BAT") under Phase I of Section 316(b) of the Clean Water Act, the amount of heated effluent is significantly reduced compared to a once-through plant, such as the plants located near the mouth of the Maumee River. Additionally, the heated effluent would be discharged offshore through a three-port diffuser with the flow directed upwards towards the surface. Such a system facilitates rapid mixing of the thermal plume and minimizes the effects on the benthic environment. Overall, the heated discharge from Fermi 3 will not significantly increase the potential for development of algal blooms.

24. The substrate in the vicinity of the Fermi site is, in general, similar to the substrates upon which *Lyngbya* was found growing in the vicinity of Maumee Bay and other areas of the western basin of Lake Erie. But, no algal blooms of *Lyngbya* or other species have been reported at the Fermi site. The lake conditions near the Fermi site (turbulence, water quality) are different from those in Maumee Bay and are not conducive to *Lyngbya* growth due to the combined effects of wind on lake currents and wave action.

25. Construction and operation of Fermi 3 is not expected to increase the potential for algal blooms in the vicinity of the site or increase the potential for establishment or survival of nuisance algal species in Lake Erie. The potential effects of Fermi 3 on algae have been evaluated and considered in the DEIS and in Michigan's NPDES permit review (and an NPDES permit has been issued).

/s/ signed electronically by
David A. Repka
Winston & Strawn LLP
1700 K Street, NW
Washington, DC 20006

COUNSEL FOR THE
DETROIT EDISON COMPANY