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)	)	

APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF CONTENTION 6

David A. Repka
Tyson R. Smith
Rachel Miras-Wilson
Winston & Strawn LLP
1700 K Street, NW
Washington, DC 20006

Bruce R. Maters
Jon P. Christinidis
The Detroit Edison Co.
One Energy Plaza
Detroit, Michigan 48226

COUNSEL FOR THE DETROIT EDISON CO.

April 17, 2012

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INTRODUCTION

Pursuant to 10 C.F.R. §§ 2.1205 and 2.710, the Detroit Edison Company ("Applicant") files this motion for summary disposition of Contention 6.[1] Contention 6 alleges a potential contribution of chemical effluent and thermal discharges from the proposed Fermi 3 to algal production in Lake Erie and to proliferation of a newly-identified nuisance species of algae. Summary disposition is warranted on the grounds that there exists no genuine issue as to any material fact relevant to the contention. The NRC Staff has addressed the entirety of Contention 6 in the Draft Environmental Impact Statement ("DEIS") for Fermi 3 and the State of Michigan recently issued a discharge permit for Fermi 3, documenting its review of the effects of thermal and chemical discharges from Fermi 3.[2] The conclusions reached by the NRC Staff in the DEIS and by the State of Michigan in conjunction with its NPDES permit review are confirmed in an

[1] Counsel for Detroit Edison has contacted counsel for the NRC Staff and Joint Intervenors. Counsel for the NRC Staff agrees that the contention is moot, while the Joint Intervenors indicate that they will oppose the motion.

[2] *See* NUREG-2105, "Draft Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3," dated October 2011; Fermi 3 NPDES Permit No. MI0058892, dated February, 2, 2012 (ADAMS Accession No. ML12037A241).

expert report prepared by Dr. Rex Lowe to support this motion.[3] Therefore, under the applicable Commission regulations, Detroit Edison is entitled to a decision as a matter of law.

This motion is supported by a Statement of Material Facts as to which Detroit Edison asserts that there is no genuine dispute and the affidavits of Peter W. Smith, Director, Nuclear Development – Licensing and Engineering, for the Detroit Edison Company,[4] Dr. Rex Lowe, professor emeritus at Bowling Green State University,[5] and Mark Gerath from AECOM Inc.[6]

LEGAL STANDARDS FOR SUMMARY DISPOSITION

In a prior summary disposition motion, Detroit Edison set forth the relevant law regarding the standard for summary disposition and does not repeat that discussion herein.[7] The relevant legal standards are also recited in the Licensing Board's decision on that motion.[8]

In summary, Detroit Edison bears the initial burden of demonstrating that no genuine issue as to any material fact exists and that it is entitled to judgment as a matter of law.[9] Once Detroit Edison meets its burden, the Intervenors must "counter each adequately supported

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3 *See* Attachment 1 – Assessment of Fermi 3 Discharge on Algal Growth in Lake Erie, dated April 6, 2012 ("Lowe Report").

4 Affidavit of Peter W. Smith in Support of Summary Disposition of Contention 6, dated April 16, 2012 ("Smith Affidavit")

5 Affidavit of Dr. Rex Lowe in Support of Summary Disposition of Contention 6, dated April 16, 2012 ("Lowe Affidavit")

6 Affidavit of Mark Gerath in Support of Summary Disposition of Contention 6, dated April 16, 2012 ("Gerath Affidavit")

7 *See* "Applicant's Motion For Summary Disposition of Contention 3," dated April 26, 2010, at 1-4.

8 *See* Order (Granting Motion for Summary Disposition of Contention 3), dated July 9, 2010, at 5-6.

9 10 C.F.R. § 2.325.

material fact with its own statement of material facts in dispute and supporting documentation" and cannot rely on "mere allegations or denials."[10] Merely "colorable" or inadequately probative evidence is insufficient to defeat a motion for summary disposition.[11] It is not sufficient for there merely to be the existence of *some* alleged factual dispute between the parties, for "the requirement is that there be no *genuine* issue of *material* fact."[12] "Only disputes over facts that might affect the outcome" of a proceeding would preclude summary disposition.[13] "Factual disputes that are . . . unnecessary will not be counted."[14]

SCOPE OF ADMITTED CONTENTION 6

Contention 6, as proposed, alleged that "[t]he COLA omits critical information disclosing environmental impacts to Lake Erie's Western Basin and Maumee River/Maumee Bay."[15] As the Board explained in its decision admitting a portion of Contention 6, the Intervenors assert that the Applicant's Environmental Report ("ER") should include an assessment of the algal bloom potential as a result of the proposed chemical discharge (*i.e.*,

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10 *Cleveland Elec. Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 754 (1977).

11 *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287, 297 (2010).

12 *Anderson v. Liberty Lobby*, 477 U.S. 242, 247-48 (1986) (emphasis in original).

13 *Id.* at 248.

14 *Id*.

15 *See* "Petition of Beyond Nuclear, Citizens for Alternatives to Chemical Contamination, Citizens Environmental Alliance of Southwestern Ontario, Don't Waste Michigan, Sierra Club, Keith Gunter, Edward McArdle, Henry Newman, Derek Coronado, Sandra Bihn, Harold L. Stokes, Michael J. Keegan, Richard Coronado, George Steinman, Marilyn R. Timmer, Leonard Mandeville, Frank Mantei, Marcee Meyers, and Shirley Steinman for Leave to Intervene in Combined Operating License Proceedings and Request for Adjudication Hearing," at 67 (Mar. 9, 2009) ("Pet.").

phosphorus) combined with thermal pollution expected during operation of Fermi 3.[16] In particular, the Board pointed to the proposed use of phosphoric acid as a corrosion inhibitor at Fermi 3, which would ultimately be discharged into Lake Erie.[17] 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 3."[18]

As summarized by the Board, the Intervenors maintain in Contention 6 that the chemical impacts from phosphorus discharges would contribute to increasing algal blooms and microcystis problems augmenting the growth of dead zones in Lake Erie.[19] Specifically, the Intervenors highlighted a new nuisance algae in Lake Erie, *Lyngbya wollei*, which they assert "seems to be centered" in warm waters at the Applicant's Monroe coal burning power plant.[20] Detroit Edison did not address *Lyngbya wollei* in the initial ER submittal. The Intervenors, however, contended that Detroit Edison needed to address potential proliferation of this new

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16 LBP-09-16 at 51.

17 *Id*. at 53; *see also*, ER at Section 3.3.2.2 and Table 3.3-1, "Chemical Additives for Water Treatment."

18 LBP-09-16 at 53-54.

19 *Id*. at 51.

20 *Id*., *citing* Pet. at 70. *Lyngbya wollei* is a large benthic algae species. Benthic algae (or periphyton) live attached to submerged substrates — rocks, wood, or rooted aquatic plants — or are associated with fine sediment (silt and sand). They can be distinguished from phytoplankton, which are algae that live suspended in the water column. There are both normal, non-nuisance benthic algae and nuisance benthic algae (*e.g.*, *Lyngbya* and *Cladophora*). *Lyngbya wollei* is a nuisance algal species that can accumulate in large benthic mats that become dislodged from the lake bottom and float to the water surface before washing onto shore.

species in relation to Fermi 3.[21] The Board therefore admitted the portion of Contention 6 that alleged a failure to discuss *Lyngbya wollei* in the ER.

On September 17, 2010, Detroit Edison submitted a Motion for Summary Disposition of Contention 6 based on its supplement to the ER that had been submitted to the NRC. Detroit Edison explained that it had addressed the issues underlying Contention 6 in a letter to the NRC, dated February 15, 2010.[22] Detroit Edison specifically revised the ER to: (1) reflect that it will not use phosphoric acid at Fermi 3 (thereby eliminating phosphorus discharges); (2) incorporate a discussion of the impacts of thermal and chemical discharges on algae; and (3) include a discussion of *Lyngbya wollei*. The NRC Staff agreed with Detroit Edison that Contention 6 was moot and that summary disposition was appropriate.

The Intervenors, however, argued that summary disposition was not warranted at that time because: (1) Detroit Edison did not consider pertinent scientific literature that suggests that *Lyngbya wollei* has been found within four lake-surface miles of the proposed Fermi 3 site; (2) that *Lyngbya wollei* is spreading and likely to prosper in substantial volumes immediately offshore from Fermi 3; (3) that the algae's successful colonization will probably be assisted both by the understated thermal plume and chemical effluent predicted to emanate from Fermi 3 on a continuing basis throughout plant operations; and (4) that *Lyngbya wollei* develops in the poorly-lit lake bottom, and that turbidity will increase with Fermi 3 construction and operation.[23]

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21 Pet. at 70.

22 *See* 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).

23 "Intervenors' Memorandum In Opposition To DTE's 'Motion For Summary Disposition of Contention 6,'" dated October 27, 2010, at 3-4 ("Intervenors Mot. Opp. Summ. Disp."); *see also* "Statement of Facts Demonstrating Issues of Material Fact, in Support

In LBP-11-14, the Board denied the motion for summary disposition. The Board noted that the ER acknowledges substantial amounts of calcium in Fermi 3 effluent and that the Intervenors asserted that calcium "boosts the growth of Lyngbya [wollei]."[24] The Board concluded that, because *calcium continues to be listed in the ER* as contributing to the chemical effluent from Fermi 3, but the ER includes no specific discussion of its potential impacts on algae growth, an issue relevant to Contention 6 remains in dispute.[25] The Board also found that the Intervenors raised a dispute regarding the methods of observation used to look for *Lyngbya wollei* at Fermi 2 and the Monroe Power Plant by arguing that the methods were not a matter of record, and, in any event, that *Lyngbya wollei* is not visible to the naked eye.[26] And, the Board pointed to supposed disputes over the impacts of thermal discharges, including the size of the thermal plume, as well as the absence of any discussion of the effects of turbidity created during plant construction and operation.[27]

As discussed further below, each of these remaining disputes has been conclusively resolved in the DEIS and in the NPDES permit for Fermi 3. There is no remaining dispute to be litigated. The DEIS contains a discussion of *Lyngbya wollei* and other nuisance algae species and evaluates the potential for Fermi 3 effluent (chemical and thermal) to cause or contribute to proliferation of algae in Lake Erie. The DEIS also discusses mitigation measures. More recently, in issuing an NPDES permit authorizing Fermi 3 discharge to Lake Erie, the State

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of Intervenors' Opposition to DTE's 'Motion for Summary Disposition of Contention 6'" ("Intervenors Statement of Facts").

24 LBP-11-14 at 10.

25 *Id*.

26 *Id*. at 10-11.

27 *Id*. at 11-12.

of Michigan confirmed that operation of Fermi 3, including chemical and thermal discharges, will not cause algal blooms or otherwise lead to adverse impacts in Lake Erie. The NPDES permit review also addressed the size of the thermal plume from Fermi 3 discharges. The expert report prepared by Dr. Lowe provides additional support for the conclusions in the DEIS and the NPDES permit review.

THE APPLICANT IS ENTITLED TO SUMMARY DISPOSITION ON CONTENTION 6

Detroit Edison moves for summary disposition of Contention 6 on the ground that there no longer exists a genuine dispute concerning any facts material to the foregoing matters.[28] The NRC Staff (in the DEIS) and the State of Michigan (in its NPDES permit review) have supplied information that eliminates the controversy, factual or otherwise, that was the basis for admitting Contention 6.[29]

A. Detroit Edison Addressed the Effects of Calcium on Algal Growth

Detroit Edison previously explained that it eliminated phosphorus discharges from Fermi 3 in order to reduce the potential for algal growth in Lake Erie.[30] This was one of the primary bases for the earlier summary disposition motion on Contention 6. In response to that motion, the Intervenors pointed to the ER discussion of the Fermi 3 effluent and highlighted the presence of calcium in Fermi 3 effluent.[31] The Intervenors further asserted, on the basis of a

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28 To the extent that the Intervenors oppose summary disposition on grounds that are not addressed in this motion, Detroit Edison incorporates the information previously provided in support of summary disposition on Contention 6.

29 *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), LBP-99-23, 49 NRC 485, 493 (1999).

30 NRC3-10-0005, Attachment 2, at 4.

31 "Statement of Facts Demonstrating Issues of Material Fact, in Support of Intervenors' Opposition to DTE's 'Motion for Summary Disposition of Contention 6,'" dated October

study cited in their Statement of Facts,[32] that calcium "boosts the growth of Lyngbya [wollei]."[33] The Board noted that calcium continues to be listed in the ER as contributing to the chemical effluent from Fermi 3, but found that the ER included no specific discussion of its potential impacts on algae growth.[34] Therefore, according to the Board, the Intervenors identified an issue relevant to Contention 6 that remains in dispute.[35] As discussed below, the presence of calcium in the Fermi 3 effluent has been addressed, as has the role of calcium in algal production. No genuine dispute remains for litigation.

1. Fermi 3 Does Not Increase Calcium Loading in Lake Erie

Operation of Fermi 3 will not result in any mass addition of calcium to Lake Erie.[36] 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.[37] 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

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27, 2010, at 2 ("Intervenors' Statement of Facts"). The Intervenors cite ER Table 3.6-2, which lists among "Effluent Chemical Constituents," calcium, at an average concentration of 71.9 ppm.

32 *Id*. at 2 (citing Jennifer Joyner et al., Growth Dynamics and Management of the Cyanobacterium, *Lyngbya wollei*, in NC and FL (Apr. 5, 2006) at 7, 9, available at http://www.ncsu.edu/wrri/conference/2006ac/pdf/Joyner.pdf).

33 Intervenors Answer to Mot. For Summary Disposition at 4.

34 LBP-11-14 at 10.

35 *Id*.

36 Lowe Affidavit at ¶8.

37 *Id*.

physically in a manner that would cause adverse water quality impacts.[38] Because the total mass of calcium in Lake Erie 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.[39]

In issuing the NPDES permit to Fermi 3,[40] the State of Michigan confirmed that operation of Fermi 3 will not cause algal blooms or otherwise lead to adverse impacts. For example, under the relevant State regulations, 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."[41] 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]."[42] In short, there is no data, evidence, or expert opinion suggesting that the timing or location of the calcium discharges — or of any other chemical discharges from Fermi 3 — would cause or exacerbate adverse water quality impacts. The issuance of the NPDES permit by Michigan further establishes the absence of such impacts.[43]

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38 Lowe Report at 11.

39 The same dilution factors that apply to thermal discharges apply to chemical discharges. "Comparison of Effluent Quality and Outfall Configuration for Fermi Units 2 and 3" at 7, 9 ("AECOM Report"). The AECOM Report is Reference 1 in the Lowe Report.

40 MDEQ issued the NPDES permit for Fermi 3 on February, 2, 2012. *See* Attachment 1 – NPDES Permit No. MI0058892.

41 *See, e.g.*, Mich. Admin. R. 323.1060

42 Mich. Admin. R. 323.1051.

43 Issuance of the NPDES permit for Fermi 3 occurred after publication of the DEIS. However, the DEIS recognized the chemical concentrations in Fermi 3 discharges, in

2. Calcium Is Not a Contributor to Algal Growth in Lake Erie

Fermi 3 discharges are also unlikely to increase the potential for *Lyngbya wollei* proliferation or cause other nuisance algal blooms. Calcium addition and its role in stimulation of *Lyngbya wollei* biomass and toxicity were cited by the Intervenors as a potential negative impact of the Fermi 3 discharge.[44] But, Lake Erie is located in a basin of limestone and dolomite, both calcium-rich minerals, and already retains relatively high concentrations of calcium.[45] And, as noted above, the Fermi discharge will not result in any mass addition of calcium to Lake Erie. As a result, Fermi 3 discharges are unlikely to increase the potential for *Lyngbya wollei* proliferation or cause other algal blooms.[46]

In Florida, where it is a nuisance, *Lyngbya wollei* has been reported to respond to increased concentrations of nitrate-nitrogen (with maximal growth rates at concentration between 0.6 and 1.5 ppm).[47] The Western Basin of Lake Erie receives significant inflow from the Maumee River that drains agro-ecosystems to the west.[48] 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.[49] As the NRC Staff noted in the DEIS, historic water quality information for Maumee Bay and recent water quality

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addition to being relatively low and similar to those in Fermi 2 discharges, would be established and controlled through the NPDES permitting process. DEIS at 5-36.

44 LBP-11-14 at 10, n51.

45 Lowe Report at 11.

46 DEIS at 5-52; *see also* Lowe Report at 11.

47 Lowe Report at 11, *citing* Cowell and Dawes 2004.

48 Lowe Affidavit at ¶7.

49 *Id*.

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.[50] And, as noted previously, phosphorus, a nutrient of concern in stimulation of nuisance algal proliferation, will not be added to discharge waters of Fermi 3.[51] Thus, Fermi 3 discharge does not result in a mass addition of either of the primary nutrients affecting *Lyngbya wollei* proliferation in Lake Erie (nitrogen and phosphorus).

Local lake conditions also affect the potential for algal growth.[52] *Lyngbya wollei* appears to be intolerant of wave action and turbulent water.[53] The sites with the greatest densities of *Lyngbya wollei* are in areas more sheltered from wave action.[54] The conditions at the Fermi discharge sites are more turbulent than the *Lyngbya*-rich sites in Maumee Bay due to the combined effects of wind on lake currents and wave action.[55] Instead of *Lyngbya wollei*, the benthic algal communities at the Fermi site were dominated by small diatoms typical of healthy sandy lake bottoms that are adapted to resist turbulent flow.[56] Based on the above, there is no genuine dispute that *Lyngbya wollei* proliferation or other nuisance algal blooms are less likely at the Fermi site than at other locations in Lake Erie due to prevailing lake conditions.[57]

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50 DEIS at 5-51 to 5-52.

51 Lowe Affidavit at ¶8.

52 *Id.* at ¶9.

53 Lowe Report at 4.

54 *Id*. at 12.

55 *Id*.

56 *Id*.

57 *See Id*.

Overall, there is no scientific evidence or expert statement presented by the Intervenors to suggest that the Fermi 3 effluent will cause or contribute to *Lyngbya wollei* proliferation or other algal blooms in Lake Erie. There is therefore no genuine dispute on this aspect of Contention 6.

B. Detroit Edison Addressed the Effects of Thermal Effluent on Algal Growth

Detroit Edison concluded that the expected thermal plume of Fermi 3 is small (9 ft by 12 ft) during summer months,[58] and that it is unlikely that algal cells would remain in the plume at the higher temperatures for sufficient time to form bloom concentrations.[59] These conclusions are supported by detailed mathematical modeling of the thermal plume, using a number of different scenarios.[60] The Intervenors questioned the estimated size of the Fermi 3 thermal plume, stating that "DTE maintains that Fermi operations will cause a 9 [ft] X 12 [ft] plume while pumping tens of millions of gallons of lakewater through its cooling system at the height of summer heat."[61] The Intervenors posited a thermal plume magnitude of about 75 acre-

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58 NRC3-10-0005, Attachment 2, at 4.

59 *Id*.; *see also* Applicant's Motion for Summary Disposition of Contention 6 at 7.

60 NRC3-10-0005, Attachment 2, at 4.

61 Intervenors Answer to Contention 6 Summary Disposition Motion at 4. The Intervenors imply that Detroit Edison is minimizing the size of the thermal plume during summer months. But, in August, when the lake temperature is at its maximum, the thermal plume is small. As the DEIS shows at 5-15, under the various scenarios modeled, the largest plume (approximately 29,500 ft^2) occurs in May. The Intervenors' failure to incorporate the effect of ambient temperatures on the size of the thermal plume again highlights the absence of any expert support for a dispute with the Detroit Edison and NRC Staff analyses. As noted above, to defeat a motion for summary judgment, the Intervenors must provide expert support to demonstrate a dispute on each material fact. The asserted facts must be material and of a substantial nature, not "fanciful" or "bald assertions." *Texas Utilities Generating Company* (Comanche Peak Steam Electric Station, Units 1 and 2), LBP-82-17, 15 NRC 593, 595-96 (1982).

feet (per day).[62] 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.[63] The Board found this unsupported statement sufficient to demonstrate a genuine dispute.[64]

However, the Intervenors' "calculation" is devoid of any probative or scientific validity and fails to incorporate (or even acknowledge) a number of key parameters associated with thermal discharges. The formula is simply a calculation of the total volume of water discharged. It does not take into account any dilution — the supposed "calculation" 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.[65] And, the Intervenors' statement is not supported by any expert calculations or modeling or by any expert affidavit.[66] In contrast, issuance of the NPDES permit by Michigan indicates that thermal discharges (and related thermal plume) from Fermi 3 are acceptable and will not cause or contribute to algal blooms.

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62 Intervenors' Statement of Facts at 2.

63 *Id*., *citing* ER at 3-17.

64 LBP-11-14 at 12.

65 *See* Lowe Report at 12. In some times of the year, the temperature of the Fermi 3 discharge is less than Lake Erie temperatures, while in other times of the year, the situation is reversed. *See* AECOM Report at Table 4. Even under the worst-case conditions, the Fermi 2 and Fermi 3 plumes are not expected to overlap. *Id*. at Figure 9; Gerath Aff. at ¶7.

66 To defeat a motion for summary disposition, the Intervenors must "counter each adequately supported material fact with its own statement of material facts in dispute and supporting documentation." *Cleveland Elec. Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 754 (1977). The Intervenors cannot rely on "mere allegations or denials." *Id*.

The supposed dispute over the size of the thermal plume is not genuine. "[U]nsupported assumptions and unsound extrapolation" cannot be used to support summary judgment motion.[67]

The Board also previously stated that Detroit Edison's assertion concerning the short residence time for algae in the thermal plume appears unusual for a species that grows on the lake bottom.[68] But, this statement was not intended to be applicable only to benthic (*i.e.*, bottom-forming) algae, such as *Lyngbya wollei*. Detroit Edison was addressing potential algae impacts generally. To the extent that the contention could be read to encompass non-benthic algae, the short residence time in the thermal plume means that non-benthic nuisance algal blooms are unlikely. The Fermi 3 discharge was specifically designed to provide for rapid mixing.[69] The turbulent mixing at the discharge location reduces locally increased water temperatures or chemical concentrations from the diffuser.[70] To the extent that the contention addresses impacts on benthic algae, the impact of the diffusers on benthic algal communities should be minimal because diffusers discharge water upward and at a high velocity.[71] Mixing occurs quickly and elevated concentrations of chemicals or temperatures are unlikely to occur on the lakebed.[72] As a result, the chemical and thermal discharges from Fermi 3 are not expected to cause or exacerbate algal blooms, including *Lyngbya wollei* and other nuisance algae. This conclusion is confirmed by issuance of the NPDES permit for Fermi 3 by the Michigan

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67 *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), LBP-96-18, 44 NRC 86, 103 (1996).

68 LBP-11-14 at 12.

69 DEIS at 5-52.

70 Lowe Affidavit at ¶9.

71 *Id*.

72 *Id*.; *see also* Lowe Report at 12; AECOM Report at 9.

Department of Environmental Quality ("MDEQ"). There is no basis for finding a genuine dispute on this issue.

C. The NRC Staff and Detroit Edison Addressed the Distribution of *Lyngbya wollei*

1. Distribution of Lyngbya wollei in Lake Erie

In response to the earlier summary disposition motion, the Intervenors asserted that Detroit Edison did not consider the literature suggesting that *Lyngbya wollei* was found within four lake-surface miles of the proposed Fermi 3 site.[73] The Intervenors cited a study documenting the presence of *Lyngbya wollei* at a location between the Monroe Power Plant and Fermi 3.[74] Since then, the NRC Staff and Detroit Edison have reviewed the literature and incorporated their findings into the environmental analyses documented in the DEIS. The information does not change the conclusion that Fermi 3 discharges are unlikely to cause or contribute to algal blooms in the vicinity of the Fermi site.

Both the NRC Staff and Detroit Edison's expert, Dr. Lowe, reviewed recent literature on the distribution of *Lyngbya wollei* in western Lake Erie.[75] They noted 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.[76] The surveys included shoreline areas from Stony Point along Michigan's shoreline to Camp Perry, the eastern most site sampled along Ohio's

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73 Intervenors' Statement of Facts at 1.

74 Intervenors' Statement of Facts at 2, *citing* Thomas B. Bridgeman and Wanda A. Penamon, "Lyngbya wollei in Western Lake Erie," 36 Journal of Great Lakes Research at 167, 168, fig. 1 (2010).

75 DEIS at 2-120; *see also* Lowe Report at 1, 4.

76 DEIS at 2-120; *see also* Lowe Report at 1, 4.

shoreline.[77] The surveys report decreasing populations of the alga further north along the Michigan shoreline and further east along the Ohio shoreline.[78] The closest record of occurrence of *Lyngbya* is in the vicinity of Sterling State Park, approximately 5 miles south-southwest of the Fermi site.[79] *Lyngbya* was not found in samples at Stony Point, which is approximately 2 miles southwest of the Fermi site.[80] As discussed further below, *Lyngbya* also was not found at the Fermi site.

Based on the information included in the DEIS and supported by Detroit Edison's expert report, there is no remaining dispute that the recent literature on the distribution of *Lyngbya* has been appropriately incorporated into the environmental analysis. The DEIS reflects the currently-available data on *Lyngbya wollei* in the western basin of Lake Erie. Summary disposition on this aspect of Contention 6 is therefore warranted.

2. Methods of Observations and Data Collection

Detroit Edison previously highlighted the similarities between Fermi 2 and Fermi 3 discharges and noted the absence of algae blooms at Fermi 2 in the course of visual inspections conducted pursuant to the plant's discharge permit and as part of research conducted by Detroit Edison biologists.[81] In response to the earlier summary disposition motion, the Intervenors argued that Detroit Edison's methods of observation were not a "matter of record."[82] The

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77 *Id*.; *see also* Lowe Report at 4.

78 *Id*.; *see also* Lowe Report at 4.

79 *Id*.

80 *Id*.; *see also* Lowe Report at 6.

81 Applicant's Motion for Summary Disposition of Contention 6 at 6–7.

82 Intervenors' Statement of Facts at 1.

Intervenors also asserted that *Lyngbya wollei* is a bacterium which grows on lake bottom surfaces and would likely not be visible to the naked eye during visual inspections.[83] As discussed below, Detroit Edison's conclusions are based on two sources. First, Detroit Edison ship and dive logs were reviewed to determine if nuisance levels of algae had been observed in the vicinity of Fermi 2 based on visual observation, which is adequate to detect *Lyngbya wollei* or other algal species growing at nuisance levels. In addition, in September 2011, Detroit Edison sampled benthic algae[84] near the existing Fermi 2 discharge and at the proposed Fermi 3 discharge site. These samples were examined microscopically for *Lyngbya* or other nuisance algae.

Detroit Edison's research vessel and SCUBA dive team have provided sampling services for the Fermi 2 environmental monitoring program since the plant began operation. 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 wollei* 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 wollei* was discovered in Maumee Bay). The logs contained no notations regarding algal mats. The divers also were asked if they had ever encountered any algae similar to *Lyngbya wollei* (*i.e.*, filamentous, mats)

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83 *Id*.

84 Benthic algae, or periphyton, live attached to submerged substrates — rocks, wood, or rooted aquatic plants (*i.e.*, "seaweed") — or are associated with fine sediment (silt and sand). They are different than phytoplankton, which are algae that live suspended in the water column.

near the Fermi 2 facility. Based on visual (naked eye) observation, they did not recollect such algae in the vicinity of Fermi 2.[85]

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.[86] 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.[87] The results indicate the presence of a typical and *healthy* assemblage of a benthic algal community.[88] There was no evidence of the presence or proliferation of nuisance benthic microalgae such as *Lyngbya* or *Cladophora* at either location.[89] These laboratory analyses confirm the absence of nuisance benthic microalgae at the Fermi site and resolve any remaining dispute regarding the adequacy of visual observations.

Because Detroit Edison has provided information on its methods of observation and data on the (normal and healthy) benthic algae community at the existing Fermi 2 and proposed Fermi 3 discharge sites, the dispute previously identified by the Intervenors has been resolved. This validates the conclusion in the DEIS that *Lyngbya wollei* or other nuisance algae

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85 Although individual algae cannot be observed with the naked eye, *Lyngbya wollei* and other nuisance algae are very apparent and visible when growing at nuisance levels. Lowe Report at 5.

86 Additional details on the analysis methodology can be found in Lowe Report at 6.

87 *Id*. at 6.

88 *Id*.

89 *Id*.

have not been observed in Lake Erie at the Fermi site. As a result, summary disposition is warranted on this aspect of Contention 6.

D. Fermi 3 Construction Will Not Adversely Impact Algal Populations in Lake Erie

In response to the earlier summary disposition motion, the Intervenors pointed to higher levels of turbidity that will be created during plant construction as causing conditions favorable to *Lyngbya wollei* growth, and they maintain that those effects are not considered in the environmental analyis.[90] The Board found that this alleged oversight also precluded granting summary disposition.[91] But now, the potential for construction to stimulate algal growth has been fully discussed in the DEIS.

According to the NRC Staff in the DEIS at 4-46 and 5-51, 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.[92] And, in assessing the potential for preconstruction and construction activities elsewhere on the site to cause algal blooms in Lake Erie in the vicinity of the Fermi site, the NRC Staff concluded that chemical and physical discharges from construction activities would not affect the density and distribution of aquatic nuisance species,

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90 Intervenors' Answer at 4; Intervenors' Statement of Facts at 2.

91 LBP-11-14 at 11.

92 DEIS at 4-46, 5-51; *see also* Lowe Report at 12 (noting that reduced light penetration will impact all benthic algal communities negatively, but concluding that the typical diatom-dominated community present at the discharge location should quickly recover following construction given the current healthy benthic algae community and the fact that diatom populations can double once or twice a day).

including *Lyngbya*, in Lake Erie.[93] This conclusion was based on controls that will be in place to protect water quality in Lake Erie such as the NPDES stormwater construction permit, the stormwater management plan for the Fermi site, and the employment of best management practices ("BMPs").[94] In addition, suspended sediments resulting from barge slip and outfall construction in Lake Erie will be contained by a floating turbidity curtain.[95] Because the DEIS takes a "hard look" at the Intervenors' concerns regarding turbidity,[96] there is no genuine dispute remaining with respect to this aspect of Contention 6.

E. The DEIS Addresses the Potential Contribution of Chemical and Thermal Effluent from Fermi 3 to Algal Production in Lake Erie

Overall, the DEIS and the NPDES permit fully resolve the issues raised in Contention 6. 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*.

The NRC Staff notes that the principal contributor to the development of algal blooms is increased nutrient levels (especially phosphorus concentrations) resulting from

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93 *See, e.g.*, DEIS at 4-46, 5-51, 7-26. This conclusion is further supported by the absence of nuisance algae at the Fermi 2 discharge location, which is already subject to periodic dredging activities.

94 *Id*.

95 *See, e.g.*, Detroit Edison Fermi 3 Project, "US Army Corps of Engineers and Michigan Department of Environmental Quality Joint Permit Application," Revision 0, dated June 2011, at Attachment 2-1, page 10 (ADAMS Accession No. ML111940532).

96 The DEIS conclusions were confirmed in the Lowe Report (at 12).

changes in land use practices, altered hydrology, and food web changes.[97] Fermi 3 will not increase the concentration of phosphorus, nitrogen, or calcium in Lake Erie.[98] 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.[99] The NRC Staff also stated that no significant algal blooms have been reported in the vicinity of the discharge from Fermi 2, which has been operating commercially since 1988.[100] Operation of Fermi 3 therefore is not expected to measurably increase nutrient levels that could affect algal blooms in the vicinity of the site.[101]

The NRC Staff also considered 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,[102] 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

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97 DEIS at 5-51.

98 *Id*. at 5-36; Lowe Report at 11.

99 *Id*. at 5-52; Lowe Report at 11.

100 As noted in the AECOM Report, the impacts from Fermi 3 discharges are expected to be, overall, less than from Fermi 2 because of the lower discharge flow rate, rapid mixing from the diffuser, smaller thermal plume, and discharge location. AECOM Report at 10. In addition, the thermal plumes from Fermi 2 and Fermi 3 are not expected to overlap, even under worst-case conditions. *Id*. at 10, 11 and Figure 9; Gerath Affidavit at ¶7.

101 DEIS at 5-52; Lowe Report at 11.

102 NRC3-10-0005, Attachment 2, at 4.

on the benthic environment. Therefore, the NRC Staff concludes that the heated discharge from Fermi 3 would not significantly increase the potential for development of algal blooms. The conclusion is supported by the NPDES permit review performed by MDEQ.

The NRC Staff recognized that 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.[103] But, no algal blooms of *Lyngbya* or other species have been reported at the Fermi site. And, as Dr. Lowe has pointed out in his report, the lake conditions near the Fermi site 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.[104]

Finally, as discussed above, the NRC Staff also examined the role of turbidity and substrate on the potential for algal growth. The NRC Staff considered the potential for turbidity associated with construction activities to cause or contribute to algal blooms and concluded that any impacts would be temporary, mitigated (*e.g.*, turbidity curtain and other permit requirements), and, in any event, unlikely to contribute to algal blooms. This conclusion is supported by the absence of adverse impacts related to periodic dredging at Fermi 2.

For all of these reasons, 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. There is no dispute that the potential effects of Fermi 3 on algae have been evaluated and considered in the DEIS and in the NPDES permit review (which resulted in issuance of an NPDES permit).

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103 DEIS at 5-52.

104 Lowe Report at 12.

CONCLUSION

For the above reasons, the Licensing Board should grant summary disposition of Contention 6.

Respectfully submitted,

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

Bruce R. Maters
Jon P. Christinidis
The Detroit Edison Co.
One Energy Plaza
Detroit, Michigan 48226

COUNSEL FOR THE
DETROIT EDISON COMPANY

Dated at Washington, District of Columbia
this 17th day of April 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)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF CONTENTION 6," "STATEMENT OF MATERIAL FACTS IN SUPPORT OF SUMMARY DISPOSITION," "AFFIDAVIT OF PETER W. SMITH," "AFFIDAVIT OF DR. REX LOWE," and "AFFIDAVIT OF MARK GERATH" in the captioned proceeding have been served via the Electronic Information Exchange ("EIE") this 17th day of April 2012, which to the best of my knowledge resulted in transmittal of the foregoing to the following persons.

Office of Commission Appellate Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: ocaamail@nrc.gov

Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Ronald M. Spritzer, Chair
Michael F. Kennedy
Randall J. Charbeneau
E-mail: rms4@nrc.gov
E-mail: mfk2@nrc.gov
E-mail: Randall.Charbeneau@nrc.gov

Johanna Thibault, Law Clerk
Ann Hove, Law Clerk
E-mail: jrt3@nrc.gov
E-mail: ann.hove@nrc.gov

U.S. Nuclear Regulatory Commission
Office of the Secretary of the Commission
Mail Stop O-16C1
Washington, DC 20555-0001
Hearing Docket
E-mail: hearingdocket@nrc.gov

U.S. Nuclear Regulatory Commission
Office of the General Counsel
Mail Stop O-15D21
Washington, DC 20555-0001

Marian Zobler, Esq.
Marcia Carpentier, Esq.
Sara Kirkwood, Esq.
Robert M. Weisman, Esq.
Joseph Gilman, Paralegal
E-mail: mlz@nrc.gov
E-mail: marcia.carpentier@nrc.gov
E-mail: sara.kirkwood@nrc.gov
E-mail: rmw@nrc.gov
E-mail: jsg1@nrc.gov

OGC Mail Center : OGCMailCenter@nrc.gov

Beyond Nuclear, Citizens for Alternatives to Chemical Contamination, Citizens Environmental, Alliance of Southwestern Ontario, Don't Waste Michigan, Sierra Club et al.
316 N. Michigan St., Ste. 520
Toledo, OH 43604-5627
Terry J. Lodge, Esq.
TJLodge50@yahoo.com

Beyond Nuclear
Reactor Oversight Project
6930 Carroll Avenue Suite 400
Takoma Park, MD 20912
Paul Gunter, Director
E-mail: paul@beyondnuclear.org

/s/ signed electronically by
Tyson R. Smith
Winston & Strawn LLP
1700 K Street, NW
Washington, DC 20006

COUNSEL FOR THE
DETROIT EDISON COMPANY