

Fermi3CEm Resource

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Please see the attached comments from the Great Lakes Environmental Law Center on the Draft EIS for Fermi 3, NUREG-2105.

Feel free to contact me with any questions or concerns.

Thank you for considering our views.

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The Great Lakes Environmental Law Center

*Protecting the world's greatest freshwater resource
and the communities that depend upon it*

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**Re: Draft Environmental Impact Statement/Environmental Impact Report for the
Combined License (COL) for Enrico Fermi Unit 3, NUREG-2105, Vol. 1**

On behalf of the Great Lakes Environmental Law Center (GLELC), thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (DEIS) for the Combined License (COL) of the proposed Unit 3 (Fermi 3) of the Detroit Edison Enrico Fermi Power Plant in Monroe County, Michigan. The GLELC is a Detroit-based nonprofit organization founded to protect the world's greatest freshwater resource and the communities that depend upon it.

Detroit Edison (Edison) proposes to construct and operate a new power reactor unit at the Detroit Edison Enrico Fermi Atomic Power Plant site in Monroe County, Michigan. This project would include "hydrological alterations to Lake Erie from operation of Fermi 3" including "increased water use, discharge of cooling water, and maintenance dredging of the intake canal." DEIS at 5-6. These proposed actions require approval from both the Nuclear Regulatory Commission (NRC) as well as permit approval from the U.S. Army Corps of Engineers (USACE) to perform certain construction activities on the site. As a result, the USACE and NRC prepared this DEIS as cooperating agencies and participated collaboratively as a review team. In reviewing the proposed construction and operations, the reviewing agencies analyzed the proposed project's environmental effects to ensure compliance with a number of statutes, policies, and regulations, most notably the Great Lakes Compact, Michigan Water Quality Standards, and the Michigan Natural Resources and Environmental Protection Act of 1994.

The GLELC has focused its review of the DEIS on issue areas central to the long-term health of the Great Lakes, as well as the communities and wildlife that depend upon the ecosystem. The GLELC has serious concerns about the adequacy of the DEIS, particularly with respect to the document's analysis of the effects of thermal pollution, consumptive water use, wetlands

degradation, and wildlife depletion. These inadequacies need to be addressed before further action on the proposed project.

Consumptive Water Use Issues

The DEIS analyzes the effect of the project on the adjacent bodies of water in a number of its sections, including water consumption. Although there are impacts to groundwater and adjacent streams in the construction of Fermi 3, “the primary water body of concern is Lake Erie, which would be the sole source of water to Fermi 3 and would receive the majority of the discharged from Fermi 3.” DEIS at 2-26. Thus, the primary concern of the reviewing agencies should also be on the effect of the Fermi 3 operations on Lake Erie.

With Lake Erie under increasing stress from various uses and interests, and tensions increasing due to the presence of so many different interests and actors trying to manage one large hydrologic system, the various states and provinces created and ratified the Great Lakes Compact in 2008 as a framework to “act together to protect, conserve, restore, improve and effectively manage the Waters and Water Dependent Natural Resources of the Basin under appropriate arrangements for intergovernmental cooperation and consultation.” Great Lakes Compact § 1.3(2)(a). Within this framework the states created a system by which all actors attempting to withdraw or consume large amounts water from the Great Lakes must seek approval from the various state actors that are party to the agreement. The review team accurately cites this approval requirement with the DEIS, stating that “with the passing of the Great Lakes Compact in 2008, any new water withdrawals within the Great Lakes Basin that would result in a consumptive use of 5 MGD [million gallons per day] or more were made subject to review by all of the States and provinces in the region.” DEIS at 2-25. This requirement, however, is merely mentioned within a single section and is not properly addressed by the DEIS.

With an estimated consumptive footprint of 20-25 million gallons per day, the Fermi 3 facility will most certainly be subject to a “regional review” from the various states and provinces within the Compact. *Id.* at 5-8. The review by the states and provinces will likely require voluminous information from Detroit Edison in order to gain approval from the Parties for their desired levels of withdrawal and consumption. Great Lakes Compact § 4.3. Each party will be able to review whether Edison’s proposed usage is consistent with the Compact based on a number of factors, most notably whether “withdrawal or consumptive use will be implemented so as to ensure that the Proposal will result in no significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water Dependent Natural Resources and the applicable Source Watershed” and whether “the withdrawal or consumptive use will be implemented so as to incorporate Environmentally Sound and Economically Feasible Water Conservation Measures.” Great Lakes Compact § 4.11. Based on the statistics given within the DEIS, Edison and the reviewing agencies will likely find that standard difficult to meet.

The DEIS states that the Fermi 3 facility will withdraw around 50 MGD of water, and consume about half that; 20-25 MGD. DEIS at 5-8. In comparison, the reviewing agencies note that “between 2000 and 2006, the US and Canadian power plants withdrew an average of 168 MGD from Lake Erie and consumed an average of 14 MGD, amounting to an average consumption

rate of 8%.” *Id.* at 2-23. Fermi 2, which accounted for about half of that average daily withdrawal for the entire lake, had a consumption rate of about 40%, far higher than other facilities. *Id.* Therefore, the proposed Fermi 3 facility, while withdrawing less water than its counterpart Fermi 2, will actually consume a great deal more water. In fact, the Fermi 3 plant will consume far more water per day than all of the nuclear facilities on Lake Erie combined on average from 2000-2006. *Id.* at 2-23.

The review team states in the DEIS that an estimated annual consumption of 7.6 billion gallons of water would only amount to about 4% of the current total consumptive use of Lake Erie, dismissing this percentage as a small impact and concluding that mitigation is not warranted. *Id.* at 5-8, 5-9. With this new facility estimated to take up such a large amount of consumptive use in comparison to its peer facilities and industrial use as a whole, the Party states to the Compact may not agree with the reviewing agencies under the standard of review set forth in the Great Lakes Compact, and find the use per se unreasonable. When looking at the long-term health of the Great Lakes Basin, the Party states are likely to note that climate change could put increasing pressure on the lake as water levels decrease and consumption from all sectors increases. The DEIS notes that “potential increases in Lake Erie water temperature resulting from climate change could increase the amount of cooling water needed for operation of the proposed Fermi 3 and other major users. Therefore, the operations of Fermi and other thermoelectric plants on Lake Erie could be altered as a result of climate change.” *Id.* at 7-10, 7-11.

Because of the uncertainty inherent in gaining approval from the regional review process under the Great Lakes Compact for a project this size, the GLELC recommends certain actions by the applicant and the reviewing agencies. First, steps should be taken to initiate an approval process under the terms of the Great Lakes Compact. Perhaps by noting the Compact review requirement in the DEIS without addressing it, the review team understands the requirements of the Compact to be separate from those that need to be outlined in an EIS process; it may in fact be an operational issue and not a construction issue, for example. However, it is clear that an approval through the regional review process of the Compact is necessary in order for the Fermi 3 facility to operate. Second, the reviewing agencies should include in the Final EIS the steps that will be taken by the relevant parties to seek and gain approval by the parties of the Compact. Included in these steps should be an explanation of why the Fermi 3 facility’s large consumptive use of water, in comparison to its counterpart facility Fermi 2 as well as other peer facilities in the region, should be allowed in accordance with the principles of the Great Lakes Compact.

Thermal Pollution Impacts

Similar to its analysis with respect to consumptive use issues, the DEIS notes the issues with thermal pollution on its discharge cooling water into Lake Erie but does not properly evaluate these issues as serious and fails to provide potential mitigation options for the Fermi 3 facility. As the review team is well aware, Lake Erie is under a number of stresses, and in particular the stress caused by warmer temperatures has lead to historically bad algae blooms that create a toxic environment for much of the natural aquatic flora and fauna. The review team notes this, stating that “current water quality concerns with regard to Lake Erie include (1) increased phosphorus loading from regional agricultural activities, which cause toxic algal blooms.” DEIS at 2-26. Additionally, the reviewing agencies also determined through sampling that area of lake

adjacent to Fermi 3 was consistent with other stressed areas of the lake, with “elevated levels of nutrients including total phosphorus, orthophosphorus, nitrate and nitrite nitrogen, and total Kjeldahl nitrogen.” *Id.* at 2-28. An increase of localized temperature caused by a large and steady discharge of cooling water could therefore have a deleterious effect on Lake Erie’s ability to regulate its own toxicity. Nonetheless, the reviewing agencies determined that thermal pollution potentially caused by the Fermi 3 facility would have a minimal impact on Lake Erie, and did not recommend any mitigation strategies for Edison.

In determining the possible impact of thermal pollution, the DEIS looks to the Michigan Water Quality Standards, which include temperature limits for Lake Erie, including mixing zone limits and applicability of the standards. These regulations state that the “Great Lakes and connecting waters shall not receive a heat load which would warm the receiving water at the edge of the mixing zone more than 3 degrees Fahrenheit above the existing natural water temperature.” MI Admin. R. 323.1070(1). Based on Lake Erie’s mean monthly temperature, the regulations give specific heat limits over which, if occurring outside of a designated mixing zone area, the temperature becomes a thermal plume. DEIS at 5-11. Approval of the size of the mixing zone varies depending on the size of the thermal plume and the body of water and is determined in the discharge permitting process, which has yet to occur. MI Admin. R. 323.1082(4).

To investigate the potential impacts of discharged cooling water with elevated temperatures on Lake Erie, Detroit Edison used a hydrodynamic model that simulates mixing processes, to evaluate the average impact and size of discharged thermal plumes. DEIS at 5-12. Based on the simulations performed under this modeling framework, Edison found that in 9 of 12 months each year, the average temperature of the potential thermal plume will be above the maximum temperature allowed under Michigan regulations. *Id.* Additionally, in three months out of the year, the difference between the mean temperature of the discharge and the mean ambient lake temperature will be over 20 degrees Fahrenheit. *Id.* Important to note within these results is that they measure mean temperature differences, which indicates that in many instances throughout the month the temperature differences will be even larger.

Noting that the thermal plume would not be large enough to reach the shoreline (primarily due to the lengthy discharge pipe called for in the design of the facility), and enormous size of the basin into which the thermal plume would be discharged, the reviewing agencies determined that the thermal pollution would have minimal environmental impact on Lake Erie and did not suggest mitigation or alternatives to the current discharge plan. *Id.* at 5-7; 5-16. This analysis is poorly framed, particularly when future projections which factor in the impact of climate change are taken into account.

The projections based on Edison’s simulations show a thermal plume that could potentially be as large as 55,000 square feet. DEIS at 5-2; 7-14. While this plume is a “small fraction of the western basin of Lake Erie,” at a localized level it could be enormously damaging, especially if the temperatures are upwards of 20 degrees Fahrenheit warmer than the mean natural temperature of the lake. This thermal pollution could result in drastic growth of toxic algae, heat stress for aquatic life, and, as the DEIS states, “the creation of favorable conditions for invasive species.” *Id.* at 5-33. Furthermore, in their analysis of possible impacts, the reviewing agencies indicate that climate change could exacerbate the issues caused by thermal plumes. Climate

change could lower lake levels, causing large thermal plumes and mixing zones caused by the shallow depths at the area of discharge (already as low as 7 feet in some areas) to expand further. *Id.* at 7-14. Additionally, as previously noted, higher average lake temperatures would lead to greater water withdrawals to achieve the same cooling effectiveness. The larger withdrawals would also lead to larger discharges, which could create even larger thermal plumes at the shallower depths. *Id.* at 7-11; 7-14.

The GLELC recommends that the reviewing agencies reevaluate the potential problems caused by thermal pollution from coolant water discharges at a more localized level before producing the Final EIS. The review team did suggest two mitigation procedures within the DEIS, the installation of a diffuser that would mix the discharge before being released into the lake and a procedure to gradually reduce the discharge of cooling water during plant shutdowns to avoid any sort of heat or cold shock to aquatic species. DEIS at 5-7; 5-35. These are positive mitigation procedures but not adequate to properly address the extent of harm that the volume of warm effluent being released by the facility. It should be noted that, as the Great Lakes Compact monitors both consumption and withdrawals, the discharge of thermal pollution as a result of a withdrawal would also be subject to a review under § 4.11 of the Compact. Therefore, it would be prudent for both Edison and the regulatory agencies tasked with approving Fermi 3 to ensure that the thermal plumes being discharged into Lake Erie “result in no significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water Dependent Natural Resources and the applicable Source Watershed.” Great Lakes Compact § 4.11.

Wetlands & Wildlife Impacts

The evaluation of the wetland areas that would be impacted by the construction and operation of the reactor, and the potential status of selected wildlife within those areas is not fully and properly addressed in the DEIS. The majority of the Fermi site, which includes Fermi 3 as well as the currently operating Fermi 2, is currently characterized as surface wetlands within the coastal zone of Lake Erie. DEIS at 2-13; 2-14. Approximately 656 acres of undeveloped lands on the Fermi site are managed as part of the Detroit River International Wildlife Refuge. *Id.* at 2-14. Wetlands are a unique habitat and provide a number of different benefits to human society and the environment, and thus they are protected by both state and federal laws requiring permits from both state and federal agencies. *Id.* at 2-53. In this case, the wetlands on the Fermi site are particularly valuable in shielding the area from flooding, as well as providing habitat for a number of species. *Id.* at 2-57; 2-58.

Between the construction and operation of the Fermi 3 facility, about 19 of the 656 acres of coastal wetlands would be permanently converted. *Id.* at 5-23. Additionally, the new facility will require some auxiliary support structures, transmission lines, and vehicular access roads, making up a transmission corridor travelling to the edge of the Fermi site that will further cause temporary destruction or soil erosion in another 93.4 acres of inland wetlands. *Id.* at 5-39; 7-21. Edison has already submitted a Joint Permit Application to both the MDEQ and USACE in order to fill these wetlands as part of construction. Within the DEIS, the reviewing agencies determined that mitigation was necessary and would be performed through 82 acres of coastal

wetland restoration at an offsite location on Lake Erie as well as 21 acres of onsite restoration as proposed by Edison within their 404 permit. *Id.* at 7-20.

The GLELC believes this mitigation plan is bereft of details within the pages of the DEIS. Further investigation into communications between the USACE and Edison reveal that as of December 2011, the USACE had still not verified the adequacy of the applicant's avoidance and minimization statement, and therefore its compensatory mitigation plan. U.S. Army Corps of Engineers Public Notice Re: Application of Detroit Edison No. LRE-2008-00443-1-S11 at 5. The Federal Regulations state that compensatory mitigation may only be employed after all appropriate and practical steps to avoid and minimize adverse impacts to aquatic resources, including wetlands and streams, have been taken. 33 CFR 325 *et seq.* The USACE needs to confirm both the necessary conversion of the wetlands on site as well as the proposed mitigation from the 404 application if it is to move forward properly. The EIS should also include proposed mitigation measures that take the potential effects of climate change on the wetland areas into account. Prolonged higher temperatures could cause increased evaporation rates, which, along with the greater likelihood of drought, could reduce the extent of wetlands in the area." *Id.* at 7-18.

In analyzing the effect of possible conversion of wetlands in the DEIS, the review team noted that there were possible threatened species that may be effected by the elimination of wetlands, and more specifically, by the creation of infrastructure and access roads within the wetlands. The DEIS noted first, that the creation of access roads creates a moderate threat to the status of the Eastern Fox Snake, listed by the State of Michigan as Threatened, due to possible vehicle mortality. DEIS at 5-142; 7-16. The DEIS also reported a potential impact to the American Lotus, also listed by the State as Threatened, due to construction activities. *Id.* at 7-20. In both cases the regulatory agencies made note that Edison would work together with the Michigan Department of Natural Resources to create protections for those Threatened species. No specific protection plans are in place at this time however, and these protections must be published and available for public comments prior to inclusion in the Final EIS.

The impact of thermal pollution on local aquatic wildlife was discussed in the previous section, but likewise, thermal pollution is another issue associated with the operations of the Fermi 3 facility with potential for increasing harm to wetlands and wildlife as climate change continues to alter lake levels and temperatures.

Conclusion

The Final EIS must fully assess the proposed project's potential impacts on Lake Erie as well as wetlands and wildlife impacts. We also encourage the applicant, in collaboration with the NRC and USACE, to begin taking steps to gain approval of their proposed water usage under the Great Lakes Compact.

The DEIS contains a significant body of data, but Detroit Edison and the reviewing agencies were too quick to conclude issues associated with thermal pollution and water consumption as minor, when in fact they are very significant. The GLELC encourages the NRC and the USACE to perform further analysis of available data and collecting additional data where existing data is insufficient to reasonably assess potential impacts and risks to water quantity, water quality,

wetlands and wildlife. Finally, the GLELC supports the continued collection of data and information, including that associated with the USACE assessment of Edison's proposed mitigation project attached to their 404 permit application, so that current and new biologically significant impacts are identified and appropriately analyzed.

The National Environmental Policy Act analysis does not require that a specific decision be made, but it does require specific steps to be taken prior to the making of a decision. In order to comply with NEPA, we request that the NRC evaluate the impacts from consumptive water use, thermal pollution, impacts on wetlands and wildlife, as well as potential impacts from climate change and cumulative impacts to Lake Erie, as outlined above, to address the inadequacies found within the DEIS.

Thank you for the opportunity to comment and for considering our views.

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