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ENVIRONMENTAL LAW & POLICY CENTER

Protecting the Midwest's Environment and Natural Heritage

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RULES & REGULATIONS

Re: Draft Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3, NUREG-2105, Docket No. NRC-2008-0566

Dear Sir or Madam:

The Environmental Law and Policy Center, a Midwest-based not-for-profit environmental quality and economic development organization, and the Michigan Environmental Council, a Michigan not-for-profit environmental organization representing a coalition of over 70 organizations, submit the following comments on the Draft Environmental Impact Statement ("Draft EIS") for Detroit Edison's Combined License ("COL") application.

The Staff's preliminary recommendation that the COL should be issued is undermined by a number of serious shortcomings in the Draft EIS:

- 1) The Need for Power analysis, which is the heart of the Draft EIS' cost-benefit analysis, is inaccurate and significantly overestimates future electricity demand.
- 2) The Draft EIS' Alternatives analysis does not properly account for renewable energy resources and energy efficiency programs.
- 3) The Draft EIS arbitrarily understates the cost of building a new nuclear power plant.
- 4) The Draft EIS fails to adequately consider waste storage impacts.
- 5) The Draft EIS fails to address the threat of terrorism.
- 6) The Draft EIS does not sufficiently consider environmental impacts from potential geological events affecting the site.

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Call = B. Olson (6901)

SUNSI Review Complete
Template = ADM-013

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These and any other shortcomings must be adequately addressed before the NRC can claim to have complied with the requirements of the National Environmental Policy Act (“NEPA”).

The thorough examination of need, alternatives, and impacts required by NEPA is vital for ensuring that the NRC complies with its legal duty to protect the public health and safety. The NRC is required to make licensing decisions that are not “inimical to the common defense and security or to the health and safety of the public,” 42 U.S.C. § 2133(d), and must carry out its duties in a manner that is consistent with its “responsibility as an independent regulatory agency for protecting the radiological health and safety of the public.” 10 C.F.R. 51.10(b). These duties can be satisfied only if the NRC objectively considers and fully and fairly evaluates the important issues identified herein and in the other public comments received on this Draft EIS.

I. THE DRAFT EIS’ NEED FOR POWER ANALYSIS DOES NOT COMPLY WITH NEPA AND NRC GUIDANCE, THEREBY LEADING TO INCORRECT STAFF CONCLUSIONS.

The Need for Power analysis fails to comply with NEPA and NRC Guidance because the analysis relies on outdated information that fails to account for the recession’s impact on electricity demand as well as the impacts of overall structural changes in the Michigan and Midwest economy, and the accelerated market penetration and integration of more energy efficient products and equipment. The NRC requires that an EIS associated with plant licensing must include a Need for Power analysis as part of the EIS’ overall cost-benefit analysis. 68 FR 55905, 55909. The Need for Power analysis attempts to determine whether there is future electricity need that a proposed plant could supply. In so doing, the Need for Power analysis measures the benefit of a new nuclear plant in the EIS’ cost-benefit analysis; a plant supplying electricity that is not needed does not provide a benefit.

While the Need for Power analysis “should not involve burdensome attempts to precisely identify future conditions . . . it should be sufficient to reasonably characterize the costs and benefits associated with the proposed licensing actions.” 68 FR 55910. Here, the Draft EIS’s Need for Power analysis fails to meet this requirement because it relies entirely on the Michigan Public Service Commission (“MPSC”) 21st Century Plan (“21st Century Plan”), a 2006 energy planning report that was prepared before the recession. Draft EIS at 8-7, 8-23. Because the electricity demand forecast contained in the 21st Century Plan was made before the global financial crisis and fails to account for the dramatic decrease in electricity demand that followed: Its predicted 1.2 percent annual electricity demand increase is far greater than what actually occurred between 2007 and today, and is much higher than current estimates of future demand. A Need for Power analysis that completely omits the second largest economic downturn in American history and Michigan’s and the Midwest’s economic transition in its demand forecasting cannot be “sufficient to reasonably characterize” a realistic demand for power in Southeast Michigan over the next 15 years.

With this inaccuracy underlying its analysis, the Draft EIS’ Need for Power analysis violates NEPA and does not conform to NRC’s mandate that the analysis “should be sufficient to reasonably characterize the costs and benefits” of the proposed plant because: (1) the analysis arbitrarily relies on an outdated, inaccurate demand forecast; (2) the reliance on this flawed data

conflicts with NRC’s Need for Power Guidance; and (3) this inaccuracy leads NRC Staff to flawed conclusions regarding the need for new power generation in the Detroit Edison service area.

A. The Draft EIS’ Electricity Demand Forecast Significantly Overestimates Southeast Michigan’s Future Electricity Demand.

The Draft EIS’ electricity demand forecast of a 1.2 percent annual increase is a significant overestimation because it is adopted from the pre-recession 21st Century Plan. A comparison of the actual electricity demand from the last five years and the 21st Century Plan’s forecast for that period shows that the recession drastically changed electricity demand and rendered the 21st Century Plan forecast inaccurate. Moreover, there is no substantial evidence that the aggressive growth forecast in the 21st Century Plan and adopted in the Draft EIS will materialize in the near future. In fact, testimony by Detroit Edison, other Michigan and Midwest utility information, and independent demand forecasts show that the Draft EIS’ demand forecast of 1.2 percent yearly growth is a significant overestimation.

To date, the Draft EIS demand forecast adopted from the 21st Century Plan has proven to be seriously overstated. A comparison of actual peak demands from 2007 through 2011 and the Draft EIS Base Case forecast shows the discrepancy.

Table 1

Year	21st Century Plan “Base Case” Peak Demand in Detroit Edison’s Service Area (MW)	Actual Detroit Edison Peak Demand (MW)	Percentage Difference Between 21st Century Plan Forecast and Actual Demand
2007	12,579	12,313	-2.1%
2008	12,682	11,251	-11.3%
2009	12,666	10,627	-16.1%
2010	12,806	10,819	-15.5%
2011	12,955	12,547	-3.2%

Sources: Draft EIS at 8-18; Michigan Public Service Commission, Michigan Energy Appraisals 2007-2008, 2008-2009, 2009-2010, 2010-2011 available at <http://www.dleg.state.mi.us/mpsc/reports/energy/11winter/index.htm>.

As Table 1 illustrates, peak demand decreased three of the five years since the 21st Century Plan was drafted, rather than steadily increasing as the Plan predicted – leading to peak demand projections that are off by orders of magnitude. While peak demand increased in 2010 and, dramatically so, in 2011, these increases were only enough to bring demand back to pre-recession levels.

Looking to the future, contrary to the 21st Century Plan and NRC Staff’s determination, there is no indication that electricity demand will continue to increase at levels close to 1.2

percent per year in the foreseeable future. Draft EIS at 8-23 (“the review team concurs with the MPSC Plan conclusion that the State will continue to experience growth in power demand into the foreseeable future.”). Detroit Edison’s own testimony before the MPSC anticipates slow demand growth and contradicts the Draft EIS’ demand forecast.

In Detroit Edison’s Application for Approval of Its Biennial Review and to Amend Its Energy Optimization Plan before the MPSC, the utility predicts a 0.9 percent annual average decrease in electricity sales between 2010 and 2015.¹ It further does not predict any dramatic demand growth after 2015. It finds that “[t]he economy will continue its plodding recovery in 2012,” and that it does not expect any significant population growth to buoy an increase in demand since population in its service area “is expected to decline for an eighth consecutive year in 2012 and . . . will decrease for several more years.”² Overall, Detroit Edison predicts that “economic activity in Southeast Michigan will almost certainly increase in 2012 but with most measures of activity lagging pre-recession levels.”³ It is plainly arbitrary and capricious for the Draft EIS to include a demand forecast that is directly contradicted by the same utility that is seeking a license.

Detroit Edison’s predictions that future electricity demand in Southeast Michigan will be modest at best and much lower than the Draft EIS’ projected 1.2 percent annual increase are corroborated by other Michigan and Midwest utilities. Consumers Energy, Michigan’s other large utility, announced on December 2, 2011 that it is canceling its plan to build a new coal-fired power plant near Bay City, Michigan because of a lack of electricity demand.⁴ The utility stated that the primary reasons for abandoning the coal plant construction “are reduced customer demand for electricity due to the recession and slow economic recovery, surplus generating capacity in the Midwest market, and lower natural gas prices linked to expanded shale gas supplies.”⁵

Other Midwest utilities have echoed that demand is lacking. Minnesota-based Xcel Energy announced in November 2011 that it is not making generation-increasing upgrades to coal-fired and nuclear plants because of shrinking demand forecasts.⁶ An Xcel Regional Vice-President stated that “[w]e are seeing a continuing economic downturn and that affects electricity demand. It doesn’t make sense to build something before it’s needed.”⁷ Minnesota’s second largest electric company decided in November 2011 to mothball the Spiritwood plant in North

¹ MPSC Case No. U-16671, The Detroit Edison Company Direct Testimony of Sherrie L. Siefman (Sept. 2011), SLS – 6. *See also* MPSC Case No. U-16582, The Detroit Edison Company Direct Testimony of Sherrie L. Siefman (June 2011), SLS-7 – SLS-8 (Testifying that electricity demand in Detroit Edison’s service area is predicted to decrease by 1.5% annually between 2010 and 2015).

² *Id.* at SLS – 10, SLS – 12.

³ *Id.* at SLS – 13.

⁴ Consumers Energy, News Release: Consumers Energy Announces Cancellation Of Proposed New Coal Plant, Continued Substantial Investments In Major Coal Units, Anticipated Suspension of Operation Of Smaller Units in 2015 (Dec. 2, 2011), *available at* <http://www.consumersenergy.com/News.aspx?id=5167&year=2011>.

⁵ *Id.*

⁶ David Shaffer, Xcel’s Power Pullback, *Star Tribune* (Dec. 1, 2011), *available at* <http://www.startribune.com/business/134825258.html>.

⁷ *Id.*

Dakota – a brand new, state-of-the-art coal-fired plant – in part because of “slower-than-expected growth in electricity demand.”⁸

Independent demand forecasts by the U.S. Energy Information Administration (“EIA”) and the Midwest Independent Service Operator (“MISO”), although themselves likely overly optimistic, are also well below the Draft EIS’ forecast. The EIA’s 2011 Annual Energy Outlook (“AEO”) for the East North Central Region (encompassing Michigan, Illinois, Indiana, Ohio, and Wisconsin) projects a 0.62 percent annual average increase in delivered electricity consumption over the next ten years.⁹ While EIA’s forecast is still half of the Draft EIS’s demand forecast, even that figure is very likely overstated as it conflicts with utility forecasts that are lower (as discussed above) and the EIA has often overestimated demand. In the AEO 2010 Retrospective, the EIA recognized that its past forecasts varied from actual electricity sales because it consistently: (1) overestimates GDP growth; (2) underestimates the price of electricity fuel stocks (coal and natural gas); (3) underestimates the pace of energy efficiency and consumption reduction technology development; and (4) underestimates structural shifts in the industrial sector away from energy-intensive industries.¹⁰

Similarly, MISO’s 2009 Long-Term Assessment Reliability Report projected an even lower 0.5 percent annual increase in demand over a ten year period in the East Region – consisting of Michigan and Northern Ohio.¹¹ This figure is also likely overstated in light of a Global Energy Partners, LLC study contracted by MISO that, after factoring in state-level energy efficiency programs, projects electricity demand growth in the MISO region to be essentially flat through 2020.¹²

The Draft EIS’ demand forecast of a 1.2 percent yearly increase is at least twice as high as EIA and MISO regional projections that themselves are likely overstated. It is arbitrary and clear error for the Draft EIS to adopt as the main component of its cost-benefit analysis a demand forecast that is vastly greater than the licensee’s own projections, other utility projections, and overly optimistic projections by EIA and MISO. Therefore, the Draft EIS’ Need for Power analysis violates NEPA and is not “sufficient to reasonably characterize the costs and benefits associated with the proposed licensing actions.”

⁸ David Shaffer, *Brand New Power Plant is Idled by the Economy*, Star Tribune (Nov. 29, 2011), *available at* <http://www.startribune.com/business/134647533.html>.

⁹ U.S. Energy Information Administration, *Annual Energy Outlook 2011: Regional Energy Consumption and Prices by Sector – Energy Consumption by Sector and Source*, Table 3 – East North Central (April 26, 2011), *available at* http://205.254.135.24/forecasts/aeo/tables_ref.cfm.

¹⁰ U.S. Energy Information Administration, *Annual Energy Outlook 2010* (Aug. 18, 2011), *available at* <http://eia.gov/forecasts/aeo/retrospective/>.

¹¹ *Id.* at 6.

¹² Global Energy Partners, LLC, *Assessment of Demand Response and Energy Efficiency Potential for Midwest ISO* (Draft, July 2010), *available at* <https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/DRWG/2010/20100802/20100802%20DRWG%20Item%2003%20Midwest%20ISO%20DR%20and%20EE%20Potential%20Assessment%20Vol%201%20DRAFT.pdf>.

B. The Draft EIS's Use of the 21st Century Plan's Out-Dated and Inaccurate Demand Forecast Contravenes NRC Guidance.

By adopting the 21st Century Plan's significantly overstated energy demand forecast, the Draft EIS violates NRC's NEPA Guidance, the Environmental Standard Review Plan ("ESRP"). The ESRP requires that in order for the NRC to incorporate a Need for Power analysis that is prepared by a state or regional authority, rather than the licensee, the NRC must determine that the analysis is: (1) systematic; (2) comprehensive; (3) subject to confirmation; and (4) responsive to forecasting uncertainties. NUREG-1555 (Oct. 1999); Draft EIS at 8-12. The Draft EIS' Need for Power analysis violates this Guidance because it is neither "subject to confirmation" nor "responsive to forecasting uncertainties." Moreover, the Need for Power analysis clearly disregards ESRP Guidance directing the agency to specifically include "economic recession" in its analysis. ESRP at 8.2.2-5.

The Draft EIS finds that the 21st Century Plan's forecast is "responsive to forecasting uncertainties" because the Plan was based on an "appropriate incorporation of existing and market conditions." Draft EIS at 8-14. This claim does not withstand scrutiny. While the 21st Century Plan might (or might not, realistically) have been based on existing conditions at the time it was drafted in 2006, the conditions the Plan was based on are plainly not current for the purposes of the 2011 Draft EIS. The 21st Century Plan cannot account for the recession and, therefore, cannot reasonably be considered to be "responsive to forecasting uncertainties" when the known current electricity market conditions are not taken into account. In short, the five-year old 21st Century Plan's stale, outdated, and inaccurate data and information should plainly not be the basis for a 2011 or 2012 decision.

The Draft EIS also concludes that the 21st Century Plan meets ESRP standards because it is "subject to confirmation." Draft EIS at 8-13. The Draft EIS finds that the 21st Century Plan meets this requirement because MISO's annual reliability assessments used the same data set as the 21st Century Plan. Draft EIS at 8-18. Instead, as discussed above, MISO's 2009 Long-Term Assessment Reliability Report forecast a demand growth rate that is 60 percent less than the 21st Century Plan. Thus, MISO analysis does not provide confirmation for the 21st Century Plan, but instead contradicts it.

Finally, the Draft EIS' Need for Power analysis and its use of the 21st Century Plan does not heed the ESRP's suggestions for reviewing non-licensee forecasts. This Guidance suggests that NRC Staff "[a]nalyze the [] estimates of the effects of economic and demographic trends on the [] projected growth of electricity demand in the relevant service area." ESRP at 8.2.2-4. Further, the Guidance specifically highlights "economic recession" for identification as "an element[] that could have contributed to diminished growth." ESRP at 8.2.2-5. By using the 21st Century Plan, which cannot account for recession or the "economic and demographic trends" resulting from the recession, the Draft EIS fails to use the ESRP's specific tools for evaluating whether the 21st Century Plan is an appropriate forecast.

C. The Draft EIS' Reliance on an Outdated, Flawed Demand Forecast and Its Supporting Data Undercut NRC Staff's Conclusions.

The NRC Staff's conclusions regarding the need for a new nuclear power plant – and therefore the new plant's benefit – is undermined by the Draft EIS' use of the 21st Century Plan's inaccurate demand data and forecasting. Based on the 21st Century Plan and its demand forecast, the NRC Staff concludes that a new reactor is needed. Staff finds that “[t]he projected growth in power demand . . . further emphasizes the need for new sources of power in the Detroit Edison service area.” Draft EIS at 8-23. Staff also finds that because of the supposed need for additional generating capacity, “the building and operation of the proposed Fermi 3 . . . would accrue benefits that most likely would outweigh the economic, environmental, and social costs associated with constructing and operating a new unit at the Fermi site.” Draft EIS at 10-31. These conclusions are arbitrary and capricious because they are based on the 21st Century Plan which, as shown above, dramatically overestimates electricity demand in Detroit Edison's service area by failing to account for the recession and structural changes to the Michigan and Midwest economy.¹³

The NRC Staff's conclusion that there is a future need for power in Detroit Edison's service area is wrong. Staff's conclusion is wrong not only because it is based on an inaccurate demand forecast that does not account for the recession and structural changes, but because the Draft EIS' use of projected demand data for the last five years, rather than actual demand data yields an inaccurate 2025 demand projection off which Staff bases its conclusions. The Draft EIS determines that peak demand in 2025 will be 15,595 MW. Draft EIS at 8-19 (Table 8-4). However, even if one adopts the Draft EIS' significant overestimate of a 1.2 percent annual demand growth, this projection does not hold up because it uses outdated, stale data as a starting point.

The Draft EIS' 2025 demand figure is based on the 21st Century Plan's 2006 estimates rather than readily available, current peak demand numbers. Using the actual 2011 demand figure of 12,547 MW¹⁴ and still assuming an annual demand growth of 1.2 percent from 2011 to 2025 yields a 2025 peak demand of 14,828 MW – 767 MW less than the Draft EIS projection. This 767 MW difference is half of Fermi 3's projected capacity and over two-thirds the capacity the Draft EIS finds would be needed after wind, solar, and energy efficiency are taken into account. Draft EIS at 8-1; at 9-64. Therefore, even when applying the Draft EIS' inaccurate demand forecast growth figure, simply using current data as a starting point shows that Staff's conclusions on future electricity need are based on an incorrect and overstated projection. Staff's failure to update the Draft EIS projections with current, known data is arbitrary and capricious, as is its conclusion that Fermi 3's generating capacity will be necessary in the future.

¹³ Staff also concludes that “introduction of new generating capacity or importing power in an amount at least equivalent to that projected for Fermi 3 is minimally necessary to meet the current loads within the Detroit Edison service area.” Draft EIS at 8-23 (emphasis added). This conclusion is also based on the 21st Century Plan's recommendations, and therefore is similarly based on outdated, pre-recession data. Draft EIS at 8-23. Further, any loss of generating capacity from the noted retirements in Southeast Michigan (Table 8-7) can be offset by importing power, as the Draft EIS recognizes that at least 2200 MW of imported power is available. Draft EIS at 8-21.

¹⁴ Michigan Public Service Commission, Michigan Energy Appraisal: Semiannual Projections of Energy Supply and Demand Winter Outlook 2011-2012 (Oct. 6, 2011) available at <http://www.dleg.state.mi.us/mpsc/reports/energy>.

The NRC Staff's overall cost-benefit conclusion is similarly flawed because of its reliance on the Draft EIS' significantly overstated demand forecast. The NRC requires a Need for Power analysis in a licensing EIS "so that the NRC may weigh the likely benefits (e.g., electrical power) against the environmental impacts of constructing and operating a nuclear power reactor." Draft EIS at 8-1. Because the Draft EIS cannot validly demonstrate that Southeast Michigan has a need for power in the foreseeable future, there is no benefit from Fermi 3's potential generating capacity. Therefore, Fermi 3's many impacts – or costs – clearly outweigh its "benefit," and NRC Staff's contrary conclusion is clear error. Furthermore, since granting Detroit Edison a license to build Fermi 3 would not provide a benefit, NRC Staff's overall "preliminary recommendation to the Commission related to the environmental aspects of the proposed action" that Fermi 3's Combined License "should be issued" is unfounded and must be reversed in the Final EIS. Draft EIS at 10-31.

II. THE DRAFT EIS' ALTERNATIVES ANALYSIS IMPROPERLY REJECTS CLEAN ENERGY ALTERNATIVES TO NEW NUCLEAR POWER.

The Draft EIS' Alternatives analysis is insufficient because it improperly disregards the combined alternative of renewable energy sources, energy efficiency, and natural gas generation. Developing renewable energy, particularly wind and solar power, and energy efficiency is a more cost-effective option for supplying electricity to Southeast Michigan than a new nuclear power plant that also has fewer adverse environmental impacts.

Renewables and energy efficiency are faster and more flexible to implement, much less expensive, cleaner, and safer than a new nuclear power plant in Michigan. This combination is faster and more flexible because building out renewables and implementing energy efficiency takes much less time than one large investment in a single plant, which, in the case of a the proposed new Fermi reactor, is not planned to go online until 2021. Draft EIS at 8-14. Moreover, renewables' and energy efficiency's siting flexibility and speedy deployment allows them to be deployed as demand and supply in the regional power market becomes clearer over time. The renewable and energy efficiency combination is cheaper than a new nuclear plant because it has much lower capital costs, shorter construction times – which leads to less expensive financing, no fuel costs, and far lower operational costs. Finally, renewables and energy efficiency are cleaner and safer because they have very limited ecological impacts, no low-level radioactive waste, no high-level radioactive waste, and no risk of catastrophic disasters.

Nonetheless, the Draft EIS' Alternatives analysis fails to "rigorously explore and objectively evaluate" these better, lower-cost, safer and environmentally preferable renewable energy and energy efficiency alternatives as NEPA requires. 40 C.F.R. 1502.14(a). The Draft EIS' analysis of alternatives to a new Fermi reactor is flawed because it improperly concludes that a new Fermi reactor is environmentally preferable to the wind and solar power, energy efficiency, and natural gas combination alternative and because it completely omits cost comparisons from the analysis. Draft EIS at 9-64 – 9-67.

The Draft EIS rejects a combination of energy efficiency programs, wind and solar power, and natural gas as a viable alternative to a new Fermi reactor because it finds that the

combination alternative would have a larger land use and air quality impact. Draft EIS at 9-68, Table 9-6. The claimed difference in land use impacts is that wind and solar power would require large land areas. *Id.* The air quality difference is attributed to the natural gas component of the combination alternative and its potential pollutant and green-house gas (“GHG”) emissions. Draft EIS at 9-65, 9-67 – 9-69. However, the Draft EIS finds that “[t]he impact of the emissions from the [natural gas] plant would be noticeable but would not be sufficient to destabilize air resources,” at 9-35, and that air impacts on human health would likewise be “small.” Draft EIS at 9-37. And while a natural gas component would have GHG emissions, it is disingenuous to dismiss a combination of alternatives that includes a significant amount of renewable power generation and energy efficiency savings – and potentially a majority amount if these options are aggressively pursued – based on GHG impacts.

Therefore, the Draft EIS’ reasons for concluding that a new Fermi reactor is environmentally preferable to the combination alternative do not withstand scrutiny. This is especially true when one considers the potential impacts from a major accident, such as the Midland disaster or Fukushima, among others. It is arbitrary and capricious to claim that nuclear power – an energy source that presents potentially catastrophic environmental and human health risks – is environmentally preferable to a clean energy alternative that does not, particularly when the claim that the combination alternative is not environmentally preferable is otherwise based on such weak footing.

The Draft EIS’ Alternatives analysis also fails to “rigorously explore and objectively evaluate” renewables and energy efficiency because it does not include any discussion of the relative costs of different alternatives. Energy efficiency and wind and solar power are much cheaper than new nuclear power. Comparing the levelized capital costs of these options is revealing: for wind and solar photovoltaic, the cost is \$1900 - \$2500/kW and \$2,000 - \$4,000/kW respectively, compared to \$6,325 - \$8,375/kW for new nuclear – approximately triple the cost of wind and double the cost of solar.¹⁵ Energy efficiency programs are even less expensive – often times paying for themselves.¹⁶ Even basic cost comparisons demonstrate that, as John Rowe, the CEO of Exelon, the largest nuclear utility in the U.S. stated, new “nuclear can’t compete” economically.¹⁷

Without considering the costs of alternative energy options, the Draft EIS cannot reasonably evaluate these alternatives. For example, wind power is disregarded as a stand-alone alternative largely because of transmission costs and uncertainty as to whether wind farms will be built despite the fact that the Draft EIS acknowledges that the Detroit Edison service area has the wind energy potential to match the capacity of a new Fermi reactor and more. Draft EIS at 9-50 (Wind capacity on the “Thumb” area could produce 12,000 – 12,400 GWh of electricity). However, if relative costs were analyzed, the Draft EIS might well conclude that transmission and wind farm build-out could be accomplished for only a portion of the new Fermi reactor’s.

¹⁵ Lazard. *Levelized Cost of Energy Analysis – Version 3.0* (June 2009).

¹⁶ Rowe, John, *Fixing the Carbon Problem Without Breaking the Economy*, Resources for the Future Policy Leadership Forum Lunch (May 12, 2010); American Enterprise Institute, *Energy Policy: Above All, Do No Harm* (Mar. 8, 2011).

¹⁷ Rowe, John, *Fixing the Carbon Problem Without Breaking the Economy*, Resources for the Future Policy Leadership Forum Lunch (May 12, 2010).

projected \$6.4 billion cost. Draft EIS at 10-26 (This figure is the “overnight capital cost.” Actual costs would be much higher, as discussed in section III). Therefore, the NRC Staff must reconsider its rejection of clean energy alternatives, and engage in the rigorous and objective analysis of such alternatives that is required by NEPA, but not found in the Draft EIS.

III. THE DRAFT EIS’ COST ESTIMATE FOR A NEW NUCLEAR REACTOR IS INCOMPLETE BECAUSE IT ANALYZES ONLY “OVERNIGHT” CAPITAL COSTS.

The Draft EIS’ cost description for a new reactor at the Fermi site violates NEPA because it includes only “overnight capital costs” without mentioning financing costs or providing a comprehensive cost summary. This selective information presents a misleadingly low cost figure. Including an incomplete cost figure violates NEPA because it contravenes one of NEPA’s central purposes, to inform the public, and it undermines the Draft EIS’ cost-benefit analysis. The purpose of the NEPA process is twofold. First, it ensures that federal decision-makers fully and fairly consider all of the environmental consequences of their actions before deciding to proceed, and, thus, helps agencies make more fully informed and well-considered decisions. Second, the EIS process provides important information about a project to the public, which may then, in turn, assist the agency in making better decisions through public comments. *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983). A key part of better agency decision-making is the EIS’ cost-benefit analysis, and it must therefore, adequately quantify costs and benefits. *See* 40 C.F.R. 1502.3; *Hughes River Watershed Conservancy v. Glickman*, 81 F. 3d 437 (4th Cir. 1996).

For the purposes of its cost-benefit analysis, the Draft EIS puts the construction cost of a new Fermi reactor at \$6.4 billion. Draft EIS at 10-26. The Draft EIS states that this figure is the “overnight capital cost,” which “assume[s] that the plant is constructed ‘overnight,’ with no interest included in the capital cost estimate.” Draft EIS at 10-25. While it states that interest is not included in the cost figure, the Draft EIS fails to mention that financing costs are one of the main expenses in building a nuclear plant; and would significantly add to the cost of a new Fermi reactor.

Georgia Power’s proposed new reactors at its Vogtle plant offer a good example. The Vogtle EIS estimated overnight capital costs for the new units to be between \$7.1 and \$7.8 billion.¹⁸ Yet, the current total cost estimate for the new units including financing is \$14 billion – almost twice the overnight capital costs.¹⁹ Therefore, if financing costs are included, one could expect the total cost estimate for a new Fermi reactor to be approximately \$12 billion, assuming everything goes smoothly.²⁰ A cost estimate that is half of the actual total is not sufficient to inform the public of potential costs or to conduct an accurate cost-benefit analysis. Moreover,

¹⁸ U.S. Nuclear Regulatory Commission, Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site, Final Report, NUREG – 1872 (Aug. 2008), at 11-16.

¹⁹ Kristi E. Swartz, Vogtle Construction Costs Rise; Project Remains Under Budget, Atlanta Journal Constitution (Nov. 21, 2011), available at <http://www.ajc.com/business/vogtle-construction-costs-rise-1236442.html>.

²⁰ In the past, cost over-runs have been even more costly. A 2007 Moody’s Investor Services analysis of 75 nuclear plants constructed between 1965 and 1986 found a 207% average cost increase from the initial estimate. In other words, the actual average cost of the plants was about triple their initial estimated costs. Moody’s Investor Services, *New Nuclear Generation in the United States* (Oct. 2007).

the Draft EIS not only makes no attempt to quantify, even generally, the potential financing costs of a new Fermi reactor, but it fails to even explicitly state that financing costs are a major component of nuclear costs.

The Draft EIS also omits a number of other known costs of building new nuclear plants and, therefore fails to provide the public or decision-makers with a complete cost summary. First, the Draft EIS omits summary of levelized cost. This comprehensive cost summary includes capital costs, fuel, fixed operations and maintenance, variable operations and maintenance to create a complete summary of the total cost of a new Fermi reactor. It also does not include decommissioning costs, which are about nine to fifteen percent of the initial capital cost of a nuclear power plant. Further, the Draft EIS also does not consider escalations in material costs nor length of construction period as it relates to added cost.²¹ Finally, it also fails to translate its cost estimate into a figure that the public can use to readily compare the costs of different energy sources, such as cost per kW.²²

The Draft EIS' use of only one misleading cost figure while failing to include any other available and more complete cost estimates prevents the public and decision-makers from understanding the true financial costs of a new Fermi reactor – violating one of NEPA's central purposes. At the same time, the Draft EIS' omissions undermine its cost-benefit analysis by understating the real costs of a new Fermi reactor thereby failing to satisfy NEPA's requirement that a cost-benefit analysis is accurate and meaningful.

IV. THE DRAFT EIS IMPROPERLY MINIMIZES WASTE STORAGE IMPACTS.

The Draft EIS is also insufficient under NEPA because it fails to adequately consider the environmental impacts from the high-level waste a new reactor at the Fermi site would generate. As part of the NEPA process, the NRC is required to take a "hard look" at the environmental consequences of a proposed action. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). The discussion of environmental impacts is designed to provide a "scientific and analytical basis" for comparing the various alternatives for achieving the project's goals. 40 C.F.R. 1502.16; *DuBois v. U.S. Dep't of Agriculture*, 102 F.3d 1273, 1286 (1st Cir. 1996). A proper analysis of the alternatives, therefore, can be carried out only if the Draft EIS provides a complete and accurate compilation of the environmental consequences of all reasonable alternatives, especially its recommended action.

The Draft EIS does not adequately consider the impacts of high-level nuclear waste storage. Despite paying lip-service to the Blue Ribbon Commission on America's Nuclear Future draft report's recommendation for the development of a central geologic high-level waste repository, the Draft EIS continues to rely on the Waste Confidence Rule ("WCR"), 10 C.F.R.

²¹ See The Keystone Center, Nuclear Power Joint Fact-Finding, (June 2007), available at http://www.ne.doe.gov/pdfFiles/rpt_KeystoneReportNuclearPowerJointFactFinding_2007.pdf (Describes cost implications of materials cost increases and construction durations).

²² According to the DEIS Fermi 3 will have a generating capacity of 1535 ± 50 MW and a capacity 93 percent capacity factor. Draft EIS at 6-1; 6-19. Therefore Fermi 3 has an expected capacity of 1428 MW. If the Draft EIS puts a construction cost of a new Fermi 3 reactor at \$6.4 billion that means that Fermi 3 construction cost is expected to be \$4,483.21/kW. *Id.* at 10-26. This simple figure – which is merely a simple calculation – is not included nor explained in the Draft EIS.

51.23, to conclude that any impacts from the storage of high-level waste would be "SMALL." Draft EIS at 6-16 - 17. The Draft EIS' discussion of this issue, however, is clearly inadequate.

The WCR is based on the assumption that sufficient repository capacity will exist to store all waste created by nuclear plants. However, there appears to be little likelihood that a high-level waste repository will be opened in the near future. Development of the only proposed federal repository site, Yucca Mountain, Nevada, has been postponed indefinitely. The Draft EIS downplays the significant potential that Yucca Mountain will not open. Moreover, even if Yucca Mountain were to be approved, that site does not have the capacity to store all of the high-level waste that will be created by existing nuclear power plants, much less from the proposed new Fermi reactor. Therefore, an additional high-level waste repository would be needed to handle waste from a new Fermi reactor. The Draft EIS must consider the impacts of the storage of additional high level waste at the Fermi site. Therefore, by not considering the impacts from long-term on-site storage of high-level waste, the Draft EIS violates NEPA's "hard look" requirement.

V. THE DRAFT EIS DOES NOT ADDRESS POTENTIAL TERRORIST ATTACKS.

The Draft Environmental Impact Statement fails to comply with NEPA's requirement that an EIS include an analysis of impacts from potential terrorist attacks. *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006), *cert. denied*, 549 U.S. 1166 (2007), held that the environmental impacts of potential terrorist attacks cannot be ignored in the EIS. In that case, the court found that the NRC acted unreasonably when it categorically refused to consider environmental effects of a terrorist attack on a spent fuel storage facility. *Id.* at 1028-1035. The Draft EIS both fails to provide a reasonable explanation for its failure to include terrorism impacts as in *Mothers for Peace*, and it provides no discussion whatsoever of the impacts from a potential terrorist attack. This complete omission without explanation does not comply with NEPA's requirements.

VI. THE DRAFT EIS FAILS TO ADEQUATELY ADDRESS IMPACTS FROM POSSIBLE GEOLOGICAL EVENTS AFFECTING A NEW FERMI REACTOR.

The Draft EIS does not fully analyze the risk and impacts from earthquakes and other geological events that could affect a new Fermi reactor. The Draft EIS finds that the risk of an earthquake at the Fermi site is not well understood, but still fails to address the environmental impacts of such an event and does not include analysis of injection well-caused earthquakes. In addition, the Draft EIS also downplays impacts from Karst geology and Lake Erie wave events.

A. Long-Term Risk Exposure From Major Earthquakes Is Not Fully Understood And Earthquake Impacts Are Not Fully Considered.

The Draft EIS and supporting documents do not fully characterize exposure to risks from major seismic events that could cause damage to reactor containment and radioactive waste storage structures at the Fermi 3 site. While the applicant refers to numerous geological studies and modeling efforts, the totality of these do not overcome the significant uncertainties that still remain about the dynamics and periodicity of major earthquakes in this region of North America.

Scientists generally understand the cause of earthquakes that occur along well established fault lines where different crustal plates adjoin. Much less is known about the cause of major earthquakes that happen far from plate boundaries such as in the Eastern and Central regions of the United States. These regions happen to feature relatively rigid bedrock that allows seismic waves to travel farther without losing intensity. Earthquakes here can be felt in an area up to ten times larger than a comparable magnitude earthquake west of the Rocky Mountains. Despite what is already known about existing faults in the crucial New Madrid Seismic Zone, the U.S. Geological Survey concludes that there must be additional, unknown faults that can generate earthquakes capable of being felt 1,000 miles away, such as the notable 1811-1812 events.

The Final Safety Analysis Report ("FSAR"), Appendix 2.5BB (Updated Characterization of Large-Magnitude New Madrid Seismic Zone Earthquake Model) underscores the uncertainty in making accurate predictions about major earthquakes in the Eastern U.S. For example, Appendix 2.5BB cites a new tectonic model that "helps explain large magnitude earthquakes in the New Madrid region, *but does not provide additional information on the location, recurrence, or size of these earthquakes.*" At 2-2109 (emphasis added). Other cited research used "high precision GPS measurements to measure crustal motion within the New Madrid seismic zone."

The Draft EIS nevertheless concludes that "[t]here is uncertainty as to the significance of data gathered to date." *Id.* (emphasis added). Although the nature and magnitude of this data uncertainty are not described, the Draft EIS hopefully adds, "the precision of velocity measurements is expected to increase as further measurements are made, *such that these measurements eventually may be used to help delineate faults and determine present-day strain rates throughout the New Madrid seismic zone.*" *Id.* (emphasis added). Therefore, as the Draft EIS plainly indicates, the capability to accurately characterize this critical geological information does not yet fully exist. In the face of this uncertainty, the Draft EIS must include potential environmental impacts that would result from a serious earthquake affecting a new Fermi nuclear plant.

Further, the Draft EIS does not include up-to-date seismic data in its analysis. The Fermi 3 FSAR relies on previously published reports for the Fermi 2 power plant, historic geologic literature, field and aerial reconnaissance, and subsurface hydrogeological and geotechnical investigations conducted in 2007. FSAR at 2.5.1. The geological and seismological characterization in the application is not current and does not include up to date data on U.S. injection well information in the Fermi 3 vicinity, which can affect seismic risk.

Greater seismic risks may currently exist in the region than reported in 2007, as confirmed by various experts and government agencies, including Ohio's Department of Natural Resources ("ODNR"). Youngstown, Ohio recently experienced an earthquake caused by a class two injection well, owned and permitted by Northstar Disposal Services. ODNR has adopted an approach requiring prudence and caution regarding the site, and this should be considered by NRC as an issue in Michigan as well. However, the Draft EIS includes no injection well information for Southeast Michigan and surrounding areas. Injection wells in the United States are regulated by the federal Underground Injection Control ("UIC") program and according to

the 2010 UIC Well Inventory, Michigan has a total of 10,470 injection wells.²³ In light of post-2007 seismic data and the recent injection well-caused earthquake in Ohio, information about injection well-caused earthquakes and their potential impacts must be considered in the EIS.

B. Karst Geology Is Not Sufficiently Characterized At The Fermi Site.

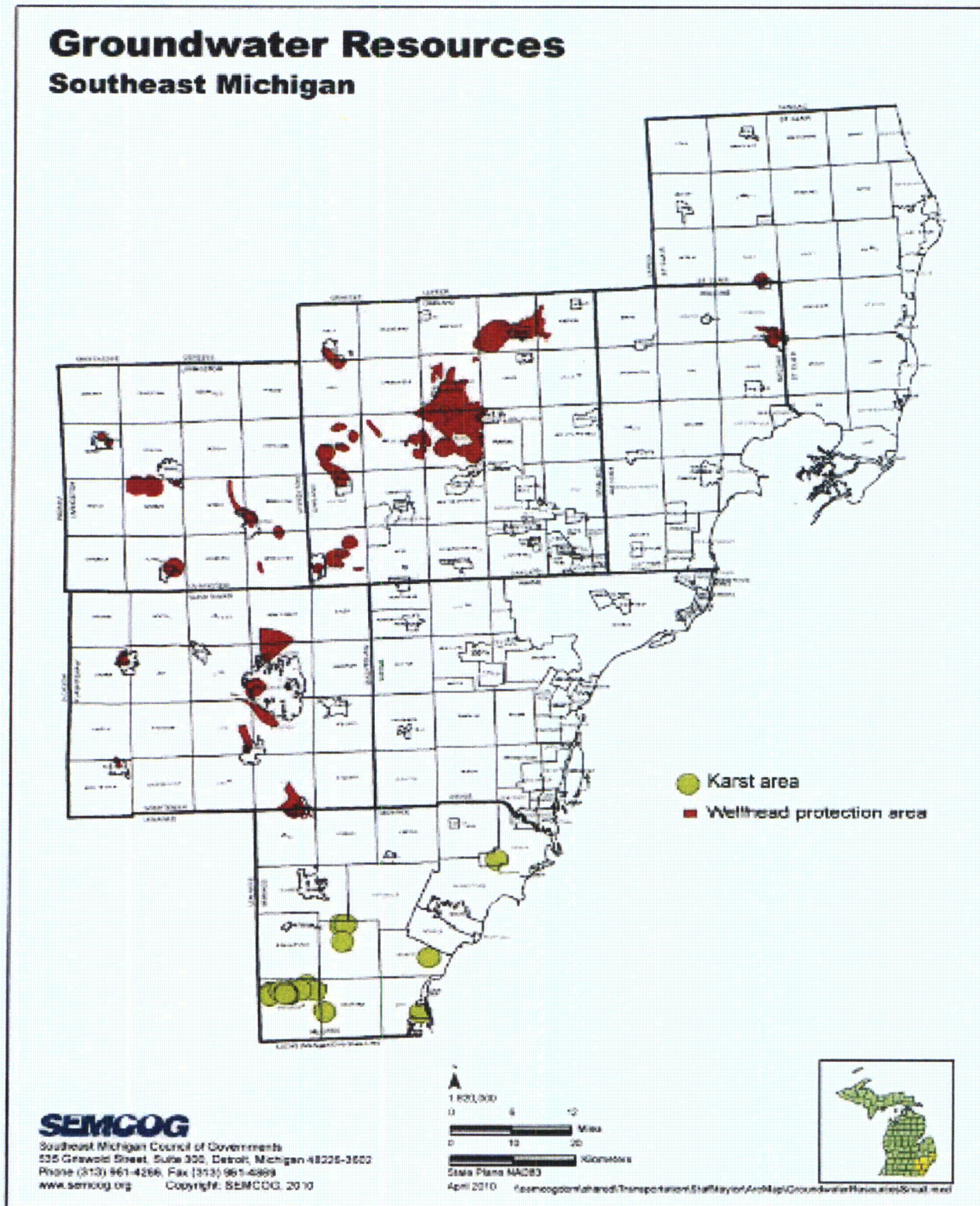
Section 2.5.3.8.2 of the FSAR claims that “the potential for nontectonic deformation at the Fermi 3 site is negligible,” and that “there is no evidence of nontectonic deformation at the Fermi 3 site in the form of unloading phenomenon (i.e., pop-up features), glacially-induced faulting, salt migration, dissolution or collapse related to karst, or volcanic intrusion.” But Figure 1 (below), which identifies several known Karst areas in Monroe County, Michigan where the Fermi site is located, demonstrates that a more thorough search for this type of subsurface formation in the area is warranted. Two concerns related to this issue include:

- Risk of future subsidence at the site that could damage the structural integrity of the reactor containment building, existing or potential radioactive waste storage facilities, and other important structures.
- Risk of contamination of groundwater beyond the Fermi site via unknown flow pathways that are typically inherent in Karst formations even where obvious underground voids are not identified through bore sampling and other techniques.

More evaluation of these risks is necessary to reduce the uncertainty raised by the existence of multiple Karst formations so near to the proposed project site as shown in Figure 1.

²³ EPA, UIC Well Inventory (2010), available at http://water.epa.gov/type/groundwater/uic/upload/UIC-Well-Inventory_2010-2.pdf; EPA, Underground Injection Wells in Region 5, available at <http://www.epa.gov/r5water/uic/r5uicwells.htm>.

Figure 1. Karst areas identified in Monroe County, MI (Source: SEMCOG, 2010)



C. The Risk Of Damage From Seiche Events Is Not Fully Considered.

The Draft EIS does not adequately address the potential risk to structures at the Fermi 3 site due to high water. Table 2-3 of the Draft EIS gives the average elevation of Lake Erie as 571.6 feet and the design elevation of Fermi 3 safety structures as 589.3 feet (North American Vertical Datum of 1988). This results in a 17.7 feet elevation difference between safety structures and average lake level. Sec. 2.3.1.1 of the Draft EIS describes wind-driven surges in lake levels, or seiches, that can occur during sustained heavy weather and that result in subsequent oscillations of water levels until a stable equilibrium is reached. The FSAR identifies seiches in the western basin of Lake Erie in Toledo that yielded a maximum recorded rise of 6.3 feet and a maximum recorded fall of 8.9 feet for the period 1941 to 1981. But beyond the water level increase from a seiche alone, there can be significantly high waves that must be fully considered in the risk analysis. For example, during one storm in November 2003, the water level at Buffalo on Lake Erie rose by 7 feet with waves of 10–15 feet for a rise of 22 feet. Therefore, water levels that have been recently recorded in Lake Erie topped the design elevation of Fermi 3 safety structures by more than 4 feet. The Draft EIS fails to address this obvious discrepancy and describe the environmental impacts that would occur if Fermi 3 were to be flooded by such an event.

CONCLUSION

For the foregoing reasons, the Draft EIS fails to satisfy the basic requirements of NEPA or provide the information necessary for the NRC to ensure that its licensing decision is not “inimical to the common defense and security or to the health and safety of the public,” 42 U.S.C. § 2133(d). In particular, the Draft EIS wrongly concludes that there is a need for a new Fermi reactor because it adopts an outdated, inaccurate electricity demand forecast. The Draft EIS also improperly rejects reasonable energy efficiency and clean energy alternatives to new nuclear power and fails to fully account for the costs of a new Fermi reactor. Further, the Draft EIS does not adequately consider the environmental impacts of on-site high-level radioactive waste storage nor the impacts from a potential terrorist threat. Finally, the Draft EIS fails to sufficiently address impacts from geologic activity that could affect the Fermi site. A proper consideration of these issues would demonstrate that the COL should be denied, because there are better, cheaper, safer, and environmentally preferable ways to meet future energy needs in Michigan and elsewhere.

Therefore, the Environmental Law & Policy Center and the Michigan Environmental Council respectfully request that the NRC: (1) Perform a Need for Power Analysis using modern and accurate information to properly conclude that there is not a demonstrated need for the electricity from a new Fermi nuclear plant; (2) Reconsider its rejection of clean energy and energy efficiency alternatives and engage in the rigorous and objective analysis of such alternatives that NEPA requires; (3) Include a cost estimate for a new Fermi nuclear plant that includes more than only an “overnight” capital cost estimate; (4) Take a hard look at the environmental impacts from the high-level waste a new Fermi reactor would generate;

(5) Include an analysis of the environmental impacts from a potential terrorist threat; and (6) Fully consider the environmental impacts from geological events that can affect the Fermi site and Lake Erie.

Sincerely,

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