CONTENTION NO. 6: The COLA omits critical information disclosing environmental impacts to Lake Erie's Western Basin and Maumee River/Maumee Bay

While in a separate contention, petitioners have addressed the cumulative and additive impacts to Lake Erie, and the Great Lakes as a whole, which Detroit Edison has ignored and should analyze, the following contention focuses on the disproportionate impacts Fermi 3 would have on Lake Erie's biologically-rich, but remarkably shallow, and thus vulnerable, western basin, as well as the shallow, vulnerable, and intensely biologically productive estuary system formed by Maumee Bay and the Maumee River downstream from the proposed Fermi 3 atomic reactor.

These contentions reference the sections of the Fermi 3 Combined License Application, Part 3 "Environmental Report," Section 2.3 "Water." They point out the need for significant corrections and additional information. Therefore, these contentions represent contentions of omission which Detroit Edison must rectify. Once Detroit Edison has provided the omitted information, data, and analyses, we request the right to review and critique the new information, with the assistance of appropriate experts, and an ample amount of time in which to do so.

Western Basin of Lake Erie Effects Information Omitted

In Section 2.3.1.1, "Surface Water Resources," Detroit Edison states "Fermi 3 is located on the Western Basin of Lake Erie. Thus Lake Erie is the primary surface water body to be considered for potential impact to Fermi 3." In Section 2.3.1.1.1, "Lake Erie Drainage Basin," Detroit Edison states "The western Lake Erie basin is a very shallow basin with an average depth of 24 feet. The western basin is partially restricted from the rest of Lake Erie by a chain of barrier beaches and islands."

Fermi 3 would be in western Lake Erie, which is far more vulnerable than the whole of Lake Erie to this proposed project's negative impacts. The Detroit Edison Environment Report (ER) at times acknowledges the western basin of Lake Erie, but then goes on to assess the proposed new reactor's projected impacts on the whole of Lake Erie, rather than the western basin of Lake Erie in particular. Given the greater vulnerability of Lake Erie's shallow western basin to Fermi 3's negative impacts, a western basin-specific analysis should be performed, rather than "watering down" Fermi 3's negative impacts by averaging them out over the entire expanse of Lake Erie, as Detroit Edison has done in its ER.

Detroit Edison's own statements made in the COL application acknowledge that the western basin of Lake Erie is distinct from the rest of Lake Erie. The western basin's shallowness not only helps account for its intense biological productivity, such as in its various fisheries, but also places the western basin and its biota at significant risk from Fermi 3. The COL application should address particular disproportionate impacts from Fermi 3 upon the western

basin of Lake Erie and its biota, rather than exclusively extending the impact analysis across the whole of Lake Erie.

Detroit Edison's ER acknowledges that the western Lake Erie basin is the first to form and to lose ice in all of Lake Erie. This is further reason that Detroit Edison's COL application should address the specific impacts from the Fermi 3 facility on the western Lake Erie's unique waters, rather than just upon all of Lake Erie as a whole.

Also regarding Section 2.3.1.1.3, "Lake Erie Western Basin," the highest water levels in the referenced charts occurred between 1997 and 1999. The lowest water levels generally occurred between 2000 and 2007, which demonstrates a downward trend in the recorded water levels for Lake Erie. From the late 1990s to the present day, Lake Erie's water level has dropped about 10 inches. This is significant, for the water bodies in the area of have an average depth of only 24 feet. Thus, a 10 inch water level drop represents about a 3.5% decrease in water levels in Lake Erie's western basin.

Climate change is predicted to continue this lowering of water levels in Lake Erie by as much as 3 to 6.5 feet over the next 70 years.[1] Such dramatic lake level drops should be taken into consideration by Detroit Edison in its Fermi 3 COL application. Its omission is significant.

Also, there is no analysis of the fluctuating water levels due to strong winds. Such dynamics are referred to as seiches. Water levels have been observed dropping several feet in a matter of hours during strong winds that push Lake Erie's waters up on one shoreline, away from others. The ER's Table 2.3-12 notes possible storm water level increases. There should also be a chart showing the potential for water level decreases due to strong winds. The western basin of Lake Erie is known for its strong and fluctuating winds.

Detroit Edison should address in the COLA what its plan is for Fermi 3 if there is not enough lake water to supply the plant's needs for cooling and makeup water, whether the decrease in Lake Erie water level is due to chronic global warming or acute wind-driven seiches.

In the ER's discussion of the western basin of Lake Erie, there is inadequate mention of the impacts from the DTE Monroe (Coal) Power Plant, which daily uses 1.9 billion gallons of water and thus has very significant thermal impacts. Because of the proximitu of DTE Monroe Coal Power Plant to Fermi 3 (two miles), some of the water in the area of Fermi 3 would already be significantly warmed above natural temperatures, even before human-caused global warming is taken into consideration. Detroit Edison must address how the addition of up to 49 million gallons per day of water usage at Fermi 3 in the summer months, the most vulnerable and critical time for algae growth, would impact algae growth and water quality in the immediate area and broader region.

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[1] http://www.epa.gov/med/grosseile_site/indicators/waterlevels.html

Detroit Edison's Section 2.3.1.1.3.4, "Conclusions on Plant Interface with Lake Erie," states "The intake Structure of Fermi 3 will allow the unit to function at full capacity at the historical low water level of the western basin."

Again, Detroit Edison has failed to address the projected three to six and one-half foot reduction of water levels projected for Lake Erie due to global climate change, which will extend the shoreline of the lake up to 2.5 miles into what is currently submerged land.

Detroit Edison thus must address the risk that the waters of the western basin of Lake Erie could very well grow too warm, due to global warming as well as the thermal pollution from multiple thermal electric power plants in the vicinity, to efficiently condense steam in the Fermi 3 reactor's steam condensers, or cool the nuclear power plant as designed. Already in recent years, certain nuclear power plants have been forced to shut down for varying periods due to their cooling water supply in the Great Lakes becoming too warm. Such an instance occurred at Cook nuclear power plant in southwest Michigan in August of 2006, when Lake Michigan's waters became too warm. A similar occurrence took place at upstate New York reactors on Lake Ontario in the late 1990s. While such risks are particularly acute for reactors that depend upon smaller, artificial lakes or rivers for their cooling water supply (such as at Browns Ferry nuclear power plant in Alabama in recent years, which was forced to shut down when the Tennessee River's water became too warm to cool the reactor), even the Great Lakes are vulnerable to such episodes. For that matter, even sea coast reactors have been forced to shut down due to the nearby ocean water growing too warm, as happened in Sweden in recent years. Nuclear power industry public relations campaigns to the contrary, Detroit Edison must address in its COLA the risk that – rather than being a solution to the climate crisis – new atomic power reactors may not even be able to function in a warming world.

In Section 2.3.2.1.2, "Consumptive Surface Water Use," Detroit Edison's references are all for Lake Erie as a whole; an impact analysis specific to the western basin of Lake Erie should also be carried out.

In this section, there is reference to water use in Monroe and Wayne Counties in Michigan. Water usage in Lucas and Ottawa Counties in Ohio has been omitted, but should also be added. The total of the waters used should be looked at with respect to western Lake Erie impacts, rather than just all of Lake Erie as a whole.

When out in a boat by the Toledo Lighthouse, the naked eye can see the stacks and/or cooling towers from five power plants, three coal and two nuclear. Now Detroit Edison proposes to add a third atomic reactor to the shoreline of Lake Erie's western basin, at Fermi 3. It is clear that all of these power plants have an impact on western Lake Erie waters, as well as on the Maumee Bay and River. These distinctive impacts should be addressed in Detroit Edison's COLA, rather than "averaged out" over the entirety of Lake Erie, as Detroit Edison is currently attempting to do in its ER.

Similarly, Detroit Edison's ER looks at water users in all of Michigan for some references, rather than also focusing on the distinctive impacts related to water usage in shallow western Lake Erie. The shallow waters of Maumee Bay turn over every five days – therefore impacts on the waters from sources are swift. Fermi 3, when the winds are right, will impact the Maumee estuary, as elaborated on further below in Maumee Bay and Maumee River-specific contentions.

Detroit Edison's Section 2.3.2.1.3, "Non-Consumptive Water Uses," again compares the non-consumptive uses to all of Lake Erie, rather than to western Lake Erie in particular. While western Lake Erie includes about one-third of Lake Erie's shoreline, it contains only about 5% of the volume of water in the whole of Lake Erie. Therefore, Detroit Edison's reference that Lake Erie has 46,661 billion gallons of water means that 5% of that volume, 2.3 billion gallons of water, is contained in Lake Erie's shallow western basin. Using this figure, and the fact that the existing power plants already present on Lake Erie's western basin use over 3 billion gallons of water a day, the addition of yet another atomic reactor at Fermi 3 certainly warrants further analysis as to impacts on western Lake Erie waters. The report then cites the need for less than a 50% use of the total supply – for western Lake Erie – but from the analysis above, this threshold appears to be as high as 100%.

In its Section 2.3.3.1, "Surface Water Quality," on page 2-102, Detroit Edison indicates that western Lake Erie water quality has improved and that phosphorous concentrations are decreasing. But this simply is not true. The State of Ohio has a Phosphorous Task Force looking into the increasing nutrient levels in Lake Erie and its western basin. The problem now appears to be dissolved phosphorous (see pertinent studies from Heidelberg University), and the amount of algae and microcystis is on the rise (see studies by University of Toledo's Lake Erie Center). The greening of the western basin and the increasing dead zones are widely recognized as growing problems. The Fermi 3 application needs to address these facts. The 2004 Lake Erie LAMP study cited by Detroit Edison is old and outdated for current phosphorous, nutrient and algae issues facing Lake Erie. These issues include a new algae, *Lyngbya Wollei*, which seems to be centered in "Warm Water Bay" at the Monroe DTE coal burning power plant. This concentration of *Lyngbya Wollei* is dislodging from "Warm Water Bay" and is multiplying in the western Lake Erie basin. Detroit Edison must address what will be the impact of Fermi 3 on the proliferation of this new harmful form of algae for Lake Erie's western basin, an issue the applicant has thus far omitted from its ER.

This section also talks about impaired fish, and uses outdated Fermi 2 studies on fish kills. Detroit Edison needs to do updated analyses on the estimated number, and type, of fish that would be killed in the Fermi 3 intakes, including how many fish are already being killed in the intakes at Fermi 2 and DTE Monroe Power Plant, as well as the additional nuclear and coal fired power plants on Lake Erie's western basin, and what the additional kills at Fermi 3 would mean to the overall fish populations.

In its Section 5.2.1.2, “Water Sources,” Detroit Edison states “Lake Erie is the makeup water source for the Station Water System (SWS),” and “Due to the vast size and capacity of Lake Erie and due to margins in the design of the intake structure to account for low lake levels, the water supply from Lake Erie is expected to be reliable for the operation of Fermi 3.”

However, in Section 5.2.1.1, the report talks about the shallow waters of western Lake Erie, with its average depth of just 24 feet. Several significant factors are absent from this analysis, which are relevant to the environmental impacts of Fermi 3. Fermi 3 is to be located at the western extreme of the western basin of Lake Erie.

Firstly, several miles along the shoreline west of the proposed site is the estuary Maumee Bay, with an average depth of only 5 feet. The impacts of the proposed Fermi 3, combined with the existing water withdrawals in Maumee Bay, from DTE’s Monroe Power Plant, Davis-Besse atomic reactor, and additional thermal electric power plants on the western basin of Lake Erie, must be analyzed. The additional projected withdrawal of 49 millions of water a day at Fermi 3, together with First Energy Bayshore (20 miles south of Fermi site), Whiting Consumers (12 miles south), and the aforementioned power plants, which together already use an average of over 3 billion gallons of water per day in the Great Lakes, must be assessed by Detroit Edison. Not doing so represents a serious omission from the ER and COLA.

Secondly, climate change reports for Lake Erie project decreases in water levels from three to six feet in just the next 60 years. This happens to be within the operational timeframe for the projected Fermi 3 atomic reactor. NRC should require in the COL application, and should itself address in the Fermi 3 EIS, “best case” and “worst case” water levels for Maumee Bay and far western Lake Erie. If there were a 6.5 foot reduction in Lake Erie water levels, Maumee Bay would have little to no water, and the two Maumee Bay power plants would no longer have a source of water upon which to draw. In addition, the 1.9 billion gallons of water a day used by Monroe DTE coal burning power plant would exacerbate the thermal impact on the waters and water quality of western Lake Erie is such dramatic lake level drops occur. Add to this the two already existing nuclear plants on extreme western Lake Erie (Davis-Besse and Fermi 2), and the problem is further exacerbated.

The bottom line is that climate change projections for Lake Erie predict lowering lake levels, which would mean not only that the reliable source of water would be diminished, but that 49 million projected gallons of additional water withdrawals each day from Lake Erie at Fermi 3 would very likely simply be too much for western Lake Erie and its ecosystem, including its biota, to handle.

Detroit Edison’s Section 5.2.1.3, “Plant Water Withdrawals and Returns,” states “During normal power operation, the CIRC requires a maximum of 34,000 gallons per minute (49 million gallons per day) of makeup water during the summer months to replace the evaporation blowdown, and drift that occurs in the natural cooling tower NPHS.”

Did the analysis by Michigan DEQ (Department of Environmental Quality) to determine the allowable pollutant levels make an assumption as to what the water levels would be? Would a 1', 2', 3', 4' 5' or 6' drop in water levels require more careful treatment for some pollutants that have no requirements now? Which pollutants would that be? These factors should be considered now by Detroit Edison in its COLA, and by NRC in its EIS.

For water withdrawals over 50 million gallons per day, Clean Water Act 316b regulations require analysis of the fish kills and water withdrawals. Fermi 3 is predicted to produce during normal operations 86 degree water and in case of a serious "blowdown" would produce up to 96 degree water discharges into Lake Erie. This would combine with thermal discharges from the existing Fermi 2 reactor, producing a greater-than 50 million gallons/day thermal discharge, which should warrant a Section 316b Clean Water Act analysis. Since the 49 million gallons projected to be used by Fermi 3 is so close to the 50 million gallon per day threshold, and because the design of this facility is in flux and not yet certified by NRC, and because of the multitude of water quantity and quality issues, including Fermi 3's proximity to Fermi 2, as well as fish kill issues, that exist, Detroit Edison should be required to carry out a full Clean Water Act Section 316b analysis.

Once again, in Detroit Edison's Section 5.2.1.4, "Present and Future Water Uses Potentially Affecting Available Water Supply," the tables referenced are for all of Lake Erie. The references should be for western Lake Erie. The average depth of Lake Erie is 62 feet, and can be more than 200 feet at the eastern end. As previously stated, the western end of Lake Erie averages only 24 feet in depth. The references for use, temperature, etc. should be for western Lake Erie in particular.

Table 2.3-3, "Lake Erie Modeled Surface Waters," references the years 1984-2004. Up until 1995, water levels were rising, but after 1995, water levels have been declining. These tables should reflect data from western Lake Erie, and should use temperatures from 1995 through 2008. These data are available.

This section again states the consumptive uses in terms of all of Lake Erie. Detroit Edison should also be analyzing consumptive uses in western Lake Erie in particular.

The turbidity from dredging needs also to assess nutrient levels in the sediments as well as Best Management Practices to minimize the sediments going into western Lake Erie, issues that Detroit Edison has omitted from its ER.

Detroit Edison's Section 5.2.1.7, "Surface Water and Groundwater Users Affected by Hydrologic Alterations," states that impacts will be minimal because of the large volume of water in Lake Erie. Again, this section should look at volumes of water in western Lake Erie, and particularly the impacts of Fermi 3's use of water on the City of Toledo and the City of Oregon public supply water intakes. Both

cities are reporting increasing challenges for water treatment because of algal blooms and turbidity. The applicant should be required to assess the impacts of the additional water withdrawals on the water quality for the Toledo and Oregon intakes in Ohio.

In Detroit Edison's Section 5.2.2.2.1, "Chemical Impacts," the impacts of the operation and the blowdown discharges should be looked at for western Lake Erie – not all of Lake Erie -- and also for climate change based on projected water level reductions.

In Section 5.2.2.2.2, "Thermal Impacts," the area of the discharge from the pipe is experiencing increases in algal blooms and microcystis. The US EPA, and the Ohio Lake Erie Commission, are currently seeking proposals to reduce the nutrient levels and the algal blooms. Any additional thermal impact at this time, would add to the degradation of water quality and habitat in western Lake Erie which is contributing to the increasing problem of growing dead zones in Lake Erie's Central Basin. Detroit Edison has omitted analysis of such issues in its ER.

In Section 5.2.2.4, "Impacts on Current Water Use," Detroit Edison looks at the use from Fermi 3, and other users, for all of Lake Erie. Again, this analysis needs to look at water use in western Lake Erie, rather than the whole lake. Certainly, it is true that withdrawals from a basin with an estuary with an average depth of only 5 feet, and the western lake basin with an average depth of only 24 feet, would have a far greater impact than for the rest of the lake as a whole with an average depth of 62 feet. This section simply needs to be redone for western Lake Erie in particular, as well as for the impacts on Maumee Bay.

In Section 5.2.2.7, "Discharge Design," the discharge pipe is projected to extend 1,300 feet into the Lake. The application does not discuss the current permitted practice in Ohio of open Lake Erie dumping of 800,000 cubic yards of sediment in the general vicinity of where the discharge pipe would be located. The design of the discharge from the pipe should take into account current open lake dumping practices, and the impacts of this discharge on open lake dumping. The location of the discharge pipe should be such that it minimizes the spread of turbidity from open lake dumping and the overall related water quality issues. Detroit Edison has omitted such analysis in the ER.

Maumee River- and Maumee Bay-Specific Information Omitted

In Section 2.3.1, "Hydrology," Detroit Edison states "There are no significant impoundments, reservoirs, estuaries, or oceans in this area that need to be considered when analyzing water impacts on the construction and operations of Fermi 3."

To the contrary, Maumee Bay and the Lower Maumee River do constitute an estuary that would be significantly impacted by Fermi 3. The Lower Maumee River, along with Maumee Bay, is considered an estuary because, at certain times, Lake Erie impacts the Maumee River for a distance of

up to 15 miles. The Maumee River is the most biologically productive single river in the entire Great Lakes Basin, and there will be a significant impact on the Maumee River from the operations and water uses at Fermi 3. The impacts on this estuary are important to assess as part of the COL application and the related EIS. NRC should require Detroit Edison to rectify these omitted analyses regarding the Maumee Bay and Lower Maumee River estuary system that would be significantly impacted by Fermi 3's construction and operation.

In Section 2.3.1.1.3, "Lake Erie Western Basin," Detroit Edison states "Thus the majority of water inflow and sediment transfer regarding tributaries closest to the site is primarily from the Detroit River and the River Raisin."

The discussion of tributaries and impacts is limited to the Detroit River and the River Raisin. The omission of the Maumee River and Maumee Bay is significant and must be rectified.

Since the waters from the Detroit River to the west, which include the waters around Fermi 3, significantly impact the very shallow, vulnerable, and intensely biologically-productive waters of the Maumee River and Maumee Bay, these waters should also be included in the analysis.

In the ER's discussion of the River Raisin, there is no mention of the DTE Monroe (Coal) Power Plant, which daily uses 1.9 billion gallons of water and thus has very significant thermal impacts. Because of the DTE Monroe Coal Power Plant, some of the water in the area of Fermi 3 would already be significantly warmed above natural temperatures, even before human caused global warming is taken into consideration. Detroit Edison must address how the addition of up to 49 million gallons per day of water usage at Fermi 3 in the summer months, the most vulnerable and critical time for algae growth, would impact algae growth and water quality in the immediate area and broader region.

Detroit Edison's ER extensively discusses the impacts on ground water at the Bass Islands, which is the subject of another contention brought by Petitioners. However, the Bass Islands are farther from Fermi 3 than is the Maumee Bay and Maumee River. Thus, since there is an extensive (albeit far from adequate) analysis of the impact on the ground water at the Bass Islands, there should certainly also be an analysis of the impacts from Fermi 3 on the surface waters of Maumee Bay and the Maumee River, as well as on the drinking water supply for Toledo and Oregon, Ohio.

To summarize and re-emphasize, **t**he Fermi 3 nuclear power plant is planned to be located in the shallowest waters of Lake Erie and the Great Lakes. Lake Erie has more consumable fish than all the other Great Lakes combined and a majority of Lake Erie's fish are in the Western Basin of Lake Erie (which includes Maumee Bay and the Maumee River). The average depth of Lake Erie in the area of the plant is but 24' and the average depth of the Maumee Bay estuary is only 5'. The proposed Fermi 3 nuclear power plant would draw millions of gallons of water from Lake Erie and Maumee Bay and kill millions more fish. Fermi 3 would be the 6th power plant killing fish and heating the water. From Bayshore Road, the naked eye can see Consumer's

Whiting (Coal) Plant, the DTE Monroe (Coal) Plant, Fermi 2 atomic reactor, First Energy Bayshore (Coal) Plant and the steam from the Davis-Besse atomic reactor. Obviously, water use, fish kills and thermal plumes from the power plants impact the ecosystem of the shallow Lake Erie and Maumee Bay waters. Detroit Edison's COLA and NRC's EIS should address the following:

1. Climate change is predicted to decrease water levels in Lake Erie from a little less than 3' to up to 6.5' in the next 60 - 70 years. Predicted decreases in water levels would literally mean that there would be no water in Maumee Bay which is water that would be used by other power plants and Fermi 3. **Climate change** and projected decreasing Lake Erie water levels should be part of the environmental review and the Fermi 3 COLA.
2. The COL application says there are no estuaries near the plant. This is not true. The shallow fishy **Maumee Bay estuary** exists east of the plant. This needs to be assessed as part of the environmental impact study and COLA.
3. The **cumulative impact of fish kills from the five existing power plants and the additional impacts of adding Fermi 3 should be assessed**. There needs to be a determination of the cumulative impacts of the fish kills at the existing five operating power plants in the far Western Basin of Lake Erie and Maumee Bay and then a determination of how many more fish Fermi 3 would kill and what the impacts on the fishery would be.
4. The Environmental Impact analysis and COLA should likewise determine the impact to the ecosystem from heating the billions of gallons of water at the existing operating five power plants. Then a determination should be made on the impacts of the **additional heated discharge waters** from the proposed Fermi 3.
5. The Environmental Impact analysis and COLA should look at the DTE Monroe's Coal Fired Power Plant, the 4th largest power plant in the U.S., water use, fish kills and mercury and other emissions to determine if DTE should be required to install a **cooling tower and mercury pollution control equipment at the DTE Monroe (Coal) Power Plant** if Fermi 3 is to get a permit.
6. The Environmental Impact Statement and COLA should assess **the risk of an attack on the power plants in the area and the resulting consequences on the water and the population**. The analyses should address what is a fair level of risk from so many power plants to the water and population of Lake Erie's western basin. The analyses should address how much power this area needs to generate to serve the population and businesses in Southeast Michigan and Northwest Ohio. The analyses should address whether there is a point at which the area is saturated with thermal electric power plants, and whether any additional thermal electric power plants should be located elsewhere.
7. The environmental impact statement and COLA should also assess the **impact on sediments and water quality** that would result from adding a 6th thermal electric power plant, the Fermi 3 atomic reactor, to the existing three coal fired power plants and two nuclear power plants already in the Western Basin of Lake Erie. Sediments and water quality in the areas of the existing coal fired power plants and nuclear plants should be assessed for radiation, mercury and other pollutants and then the estimated additional impacts from the proposed

Fermi 3 to the sediments and the water should be added. The analyses should address what percentage of water in Maumee Bay is currently used by the existing power plants, and how much more would be used by Fermi 3. The assessment should also address the percentage of Maumee Bay water that would be used, given the expected climate change caused water level reductions of 3′ to 6′ in the next 60 to 70 years.

8. The COL application talks about the influence of the Detroit River on Toledo's water intake and then fails to **include the Toledo water intake in its environmental analysis. Detroit Edison must address this omission.**

9. The COL application uses phosphorous data from 1997 – 2003 and says phosphorous(algal blooms) is not a problem. This is simply not true. Research clearly shows that since 1995 dissolved phosphorous and algal blooms and microcyctis in the Maumee River and Western Lake Erie are increasing. Ohio EPA has a Phosphorous Task Force trying to find ways to reduce the increasing green waters. The Lake Erie Protection Fund and the US EPA Great Lakes office are currently seeking grant proposals to find ways to reduce phosphorous and algal blooms in Western Lake Erie. The environmental assessment and COLA needs to include an assessment of **impacts on phosphorous and nutrient growth and algal blooms** that would result from the Fermi 3 atomic reactor.

10. A new form of algae – *Lynbya Wollei* – is in Maumee Bay and Western Lake Erie. This benthic algae is spreading in Maumee Bay and Western Lake Erie. It appears that the *Lyngbya* thrives in what is known as "Warm Water Bay" at DTE's Monroe coal fired power plant, in the 1.9 billion gallons per day of warm water discharge. The warm water, combined with the sewage from the River Raisin, appear to provide the ideal environment for *Lyngbya* to thrive. The COL should address what the **impact of Fermi 3 would be on the spread of *Lynbya***. NRC and relevant federal and state agencies should determine whether DTE should be required to take some action because of the *Lyngbya* problem.

11. The COL application uses **old impingement and entrainment data** from Fermi 2. This data is decades old, and a new impingment/entrainment assessment should be made.

12. The application only looks at Monroe County for Surface Water – **the surface water analysis should include Lucas County (Ohio), Ottawa County (Ohio), Monroe County(Michigan), and Wayne County(Michigan).**

13. The fish impingement/entrainment discussion does not update estimates from Fermi 2 - and does not look at the cumulative impact of adding one more fish killing source, the proposed Fermi 3 atomic reactor. Detroit Edison's ER also does not address the decreasing yellow perch populations in Lake Erie, nor the increased controls on commercial fishermen in Ohio. The environmental assessment and COLA should address these issues.

CONTENTION NO. 7: Routine operations of Fermi 3 will endanger workers and the public with radionuclide emissions

The construction and operation of Fermi 3 will produce radioactive contamination which expose the workforce at the plant, and the general public, to increased risk of negative health effects.

Fermi 3 venting of radioactive gaseous effluents is outlined in Part 7. The Departures Report clearly indicates that the design objective of the Economically Simplified Boiling Water Reactor (ESBWR) is considered acceptable because (FSAR Subsection 12.2.2.1.) it meets the design objective of providing a vent path for the RWVS, TBVS, FBVS, and RBVS (Reactor Building, Fuel Building, Turbine Building, and Radwaste). DTE believes that the changes will not adversely affect any safety-related systems. In discussing the Departure justification from the reference ESBWR, DTE states that: This Departure is acceptable because it meets the design objective of providing a vent path for the RWVS, TBVS, FBVS, and RBVS. The change does not adversely affect any safety-related system.

Petitioners contend that the workers and and the public will, by design, be exposed to radiological gaseous effluents. The ESBWR is by design, intended to vent radiological gaseous effluents. This vent configuration has been evaluated by GEH (General Electric Hitachi)and has been found to be acceptable for inclusion into the ESBWR design.

DTE then concludes: Therefore, this Departure has no safety significance.

Petitioners contend that the very design has safety significance because it aids and abets the release of known carcinogenic agents namely radiological gaseous effluents and liquid effluents. Below is acknowledgement by DTE that Fermi 3 will exceed Effluent Concentration Limits (ELC). “The analysis concluded that even with relaxation of conservatisms the results would be expected to exceed the Effluent Concentration Limits (ECL). The basis for this conclusion is that the concentration of several of the radio nuclides were well above the ECL; and one of the radio nuclides exceeds the ECL by a factor of more than 5E+03.”(FSAR Section 2.4.13 Analysis)

In NRC RAI (2.4.13-6)/ Letter dated 1/14/09 the NRC requested that DTE:

> Provide a description of the process followed to determine the conceptual models for surface and subsurface pathways and for site characteristics that affect transport of radioactive liquid effluents in ground and surface waters to ensure that the most conservative of plausible conceptual models has been identified pursuant to the guidance provided in SRP 2.4.13. Also provide analysis based on the most conservative of all the plausible models to demonstrate compliance with 10 CFR part 20 Appendix B Table 2 ECL limits. In the supplemental information that contained the analysis of radionuclide transport for an assumed failure, the results show exceedance of the ECL limits for 12 radionuclide isotopes for both assumed receptors' (Lake Erie to

the east and a receptor well to the west). The applicant also stated that even if the conservatism assumed in the analysis, more specifically the maximum groundwater velocity, dilution, assumption of continuous ingestion were to be relaxed, the resulting concentrations will still be above the ECL limits. Please include in the analysis the basis for the preceding conclusion of the applicant.

Detroit Edison responded (February 16, 2009 and posted to public March 6, 2009):[1]

Section 2.4.12.3.2 describes the transport model for groundwater at the site. As described therein groundwater velocity is locally dependent on hydraulic conductivity, hydraulic gradient, and porosity. Hydraulic gradient was determined based on the water elevation maps described above. Hydraulic conductivity was determined in Section 2.4.12.2.4, as described above. As described in Section 2.4.12.3.2, no porosity field data was collected. In lieu of using field data, literature values for porosity were used to determine groundwater velocity.

Velocity calculations were •performed using high and low range estimates (10 - 25 percent for glacial till, 25 percent for rock fill, 1 - 20 percent for limestone/dolomite) to bracket the range of possible results. Based on these values, calculated groundwater velocities and estimated travel times to the closest postulated receptors are reported in Section 2.4.12.3.2. The analysis of the most conservative of the plausible scenarios was provided in Detroit Edison
Company Submittal of Fermi 3 FSAR Section 2.4.13 Analysis, dated November 11, 2008;-which will also be included in Revision I to the FSAR Section 2.4.13. The analysis concluded that even with relaxation of conservatisms the results would be expected to exceed the Effluent
Concentration Limits (ECL). The basis for this conclusion is that the concentration of several of the radio nuclides were well above the ECL; and one of the radio nuclides exceeds the ECL by a factor of more than 5E+03.

As noted in the responses above, Detroit Edison is now able to perform laboratory testing to determine site specific values for distribution coefficients and retardation factors. Using these factors, coupled with relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release), Detroit Edison expects the subsequent results to be less than the ECL. Using the results from the laboratory testing, Detroit Edison will update the analysis to credit these factors. The results from the testing and the updated analysis will be provided in a subsequent submittal to the NRC by September 1,

[1]Petitioners have made good faith efforts to identify information made available, right down to the excessively-early deadline for the filing of this contention. Petitioners reserve the right to amend this contention to respond to changing information as it becomes available after March 9, 2009.

2009.

Proposed COLA Revision A revised COLA markup will be included with the results and the updated analysis upon completion of the laboratory testing.

Petitioners take issue with “Using these factors, coupled with relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release), Detroit Edison expects the subsequent results to be less than the ECL.”

Petitioners disagree that dilution can be the solution to radiological pollution. Lake Erie and the surrounding environs will be impacted greatly by this methodology. The practice of dumping radioactive effluents into the air and water is unacceptable. Furthermore, other than to mask the true nature of the radiological contamination levels, dilution is not the solution.

The aforesaid Request for Additional Information pertaining to Radiological Effluents is unresolved and will not be reported back on until September 2009. Since Petitioners had less than three days to review documents responding to RAI dated 1/14/09 responded to by DTE on 2/16/09 and subsequently made public 3/6/09 on NRC Fermi 3 webpage, they request that they be accorded adequate time to review the record and request that the record remain open for all open contentions pertaining to RAI’s. These necessary documents were not made available to the public for review until March 6th in order to meet the March 9th, 2009 filing deadline. The public cannot contest what it cannot review. This amounts to petitioners having to take aim at a moving target, and clearly puts petitioners at a structural disadvantage to bring forward concerns in earnest.

Workers will be exposed to radiation from the existing Fermi 2 as outlined in the following sections:

Direct Radiation Sources (4.5.2.1)
A large portion of the radiation dose to construction workers is expected to be due to the “skyshine” (gamma radiation that scatters in the atmosphere and is reflected back to the ground) from the nitrogen-16 (–16) source present in the operating Fermi 2 main turbine steam cycle. Hydrogen Water Chemistry (HWC) is employed at Fermi 2 in order to control the production of corrosion products and thereby mitigate intergranular stress corrosion cracking of susceptible components. The Fermi 2 Updated Final Safety Analysis Report (UFSAR), Table 11.1-5, indicates an –16 specific activity of 100 µCi/g in the steam for normal water chemistry, and 600 µCi/g for HWC (Reference 4.5-1 R). The –16 activity present in the main steam lines, turbines, and moisture separators provides an air-scattered radiation dose contribution to locations outside Fermi 2 structures as a result of the high energy gamma rays which –16 emits as it decays. Other sources at the Fermi 2 with the potential for a direct radiation dose contribution to construction workers are the condensate storage tanks and the onsite low level waste storage facility. The minimal activity within the tanks and the concrete

shielding used in the design of the onsite storage facility results in a negligible dose rate at the site boundary (Reference 4.5-1,Section 12.1.1.2). Therefore, these sources of direct radiation are deemed negligible in comparison with the skyshine doses when considering the dose to construction workers.

Depending on the construction schedule undertaken for Fermi 3, a potential source of direct radiation could be an independent spent fuel storage installation (ISFSI). Currently, there is no ISFSI at the Fermi site, but there are plans to construct an ISFSI in the near future using a Holtec HI-STORM system. Radiological data from other boiling water reactor ISFSIs using similar systems indicate dose rates at the fence surrounding the ISFSI range from 0.015 mrem/hr to 0.50 mrem/hr, depending on how many casks are loaded onto the ISFSI pad closest to the fence. The proposed Fermi ISFSI location is approximately 750 feet from the Fermi 3 construction site (TLD T48), which results in an estimated dose rate that is in the range of 4.5 x 10-4 mrem/hr to 2.2 x 10-3 mrem/hr. For a 2080 hour exposure period, the estimated dose would be in the range of 1.0 mrem/yr to 5.0 mrem/yr due to the ISFSI.

Radiation from Gaseous Effluents (4.5.2.2)
Fermi 2 is designed with the provision for releasing airborne effluents via three gaseous effluent release points to the environment. These are the radwaste building vent, the reactor building vent, and the turbine building vent (Reference 4.5-1, Section 11.3.7). The reactor building vent is the primary release point and includes exhaust from the offgas system, turbine gland seal system, and the reactor building ventilation. The turbine building vent contains low activity exhaust resulting from small leaks from the turbine, condenser and other components in the turbine building. The radwaste building vent contains low activity exhaust resulting from small leaks from laboratory fume hoods, tank vents, and contaminated cubicles. The expected radiation sources (nuclides and activities) for the primary gaseous effluents are listed in the Fermi 2 UFSAR, Table 11.3-1 (Reference 4.5-1).

Radiation from Liquid Effluents (4.5.2.3)
Fermi 2 releases radioactive liquid effluents via the circulating water reservoir blowdown line. The minimum dilution flow is approximately 10,000 gpm (Reference 4.5-1, Section 11.2.8). The annual expected maximum dose to an individual resulting from Fermi 2 liquid effluents is presented in the Fermi 2 UFSAR (Reference 4.5-1, Appendix 11A). When effluents are released, they discharge directly to Lake Erie via the circulating water reservoir blowdown line. Lake Erie provides further dilution through natural mixing characteristics in the vicinity of the discharge. From Figure 4.5-1, it is clear that construction activities for a new facility would be well removed from the release point for liquid effluents.

4.5.3 Measured and Calculated Radiation Dose Rates
Measured and reported data from Fermi 2 is available for gaseous

and liquid effluents, as well as direct radiation sources. This information is reported annually to the NRC as part of the Radioactive Effluent Release and Radiological Environmental Operating Report. Reports from the years 1999 through 2006 were utilized in the preparation of this section (Reference 4.5-2 through Reference 4.5-9).

4.5.3.1 Dose Rate from Direct Radiation Sources

Fermi 2 measures radiation doses at various locations on the site using thermoluminescent dosimeters (TLDs). As shown on Figure 4.5-2, TLDs T47, T48, T54, and T64 are the TLDs closest to the expected construction areas for the Fermi 3 site. The location of TLD 47 represents the maximum radiation exposure a construction worker is expected to encounter, TLD T48 is representative of the near edge of the Fermi 3 construction site (southwest of the Fermi 2 plant buildings), TLD T54 is representative of the far edge of the Fermi 3 construction site, and TLD T64 is representative of the location of the planned ISFSI construction site due west of Fermi 2. Measurements from these TLDs are used to determine the expected direct radiation dose to construction workers. Table 4.5-1 collects eight years of radiation dose rate data for the four TLDs of interest. As explained in the footnotes of the table, the dose rates from the Radioactive Effluent Release and Radiological Environmental Operating Reports are expressed in units of radiation exposure (Roentgen) and represent one year (365 days x 24 hours/day = 8760 hours) of exposure time. In order to compare the expected dose rates to the dose limits prescribed in 10 CFR 20, conversion of these dose rates into mrem/yr is necessary. The most limiting annual dose rates at the four TLDs of interest was 316.53 milliroentgen/yr, recorded at TLD T47 in 2004 and 162.28 milliroentgen/yr, recorded at TLD T48 in 2004 (Reference 4.5-7). TLD T47 and TLD T48 are approximately 525 ft and 1000 ft from the centerline of the Fermi 2 Turbine Building, respectively (Reference 4.5-9). Conversion of these radiation exposures into a dose equivalent in tissue is accomplished by multiplying by 0.95 (Reference 4.5-10). Conversion results in an annual dose rate of 300.70 mrem/yr at T47 and 154.17 mrem/yr at T48. The annual dose measured at these TLDs was accumulated over an exposure time of 8760 hours. It is assumed that construction workers will work standard 8-hour shifts. Applying this work rate to 5 days per week, 52 weeks per year, yields 2080 hours per year.

Therefore, the annual dose to a construction worker due to direct radiation at the Fermi 3 construction site is approximately 71.4 mrem/yr at TLD T47 and 36.6 mrem/yr at TLD T48. While the dose rate measured at TLD T47 is the most bounding of the four TLD locations, this location overestimates the average dose rate a construction worker would incur on the Fermi 3 construction site. From Figure 4.5-1 and Figure 4.5-2, TLD T47 is located on the Protected Area fence south of the Fermi 2 Turbine Building, well removed from the eventual location of the Fermi 3 building structures. As such, the location of TLD T48 is more representative of the areas where the bulk of the construction activities will occur. TLD T48 provides a more representative

dose rate to a construction worker and is used to calculate the radiological impact to construction workers at the Fermi 3 site.

As a comparison, the most limiting annual dose at TLD T54 was 72.30 milliroentgen/yr in 2000 (Reference 4.5-3). TLD T54 is approximately 1530 ft from the centerline of the Fermi 2 Turbine Building (Reference 4.5-1). The estimated annual dose to a construction worker at TLD T54 is approximately 16.3 mrem/yr. The most limiting annual dose at TLD T64 was 86.85 milliroentgen/yr in 2000 (Reference 4.5-3). TLD T64 is approximately 1340 ft from the centerline of the Fermi 2 Turbine Building (Reference 4.5-1). The estimated annual dose to a construction worker at TLD T64 is approximately 19.6 mrem/yr. The dose measured by these TLDs includes background radiation. Based on remote TLDs background radiation is approximately 50 mrem per year. This corresponds to an annual radiation dose to a construction worker of approximately 12 mrem per year based on a 2080 working hours in a year. Subtracting the background radiation yields a direct dose from Fermi 2 as measured by T48 of 24.6 mrem per year.

4.5.3.2 Dose Rate from Gaseous Effluents

Environmental radiological monitoring data obtained from the Fermi 2 Annual Radioactive Effluent Release and Radiological Environmental Operating Report were used to assess any potential radiological impact on construction workers due to the operation of Fermi 2. The data from these reports is considered representative for the Fermi 3 site dose evaluations.

The Annual Radioactive Effluent Release and Radiological Environmental Operating Reports for 1999 through 2006 (Reference 4.5-2 through Reference 4.5-9) give both the airborne effluent doses for the most highly exposed individual living near the plant, as well as the maximum potential dose to a visitor to Fermi 2 due to all radioactive effluents, including noble gases. The annual doses to the most highly exposed individual living near the site are negligible. TLD T54 is positioned very close to the Fermi 2 Visitor’s Center. Due to the proximity of this location to the expected Fermi 3 construction site, the dose rates due to gaseous effluents calculated at the Visitor’s Center are representative of the dose rates to which the construction workers would be exposed. The radiological data was collected for the years 1999 through 2006 and is presented in Table 4.5-2 (Reference 4.5-2 through Reference 4.5-9). The annual doses at the Visitor’s Center were calculated based on an exposure time of 4 hours/year. Dividing these annual doses by four results in an hourly dose rate which is representative of what a construction worker could expect to receive, and can then be used to extrapolate the dose rate to construction workers on an annual basis (2080 hours) due to gaseous effluent from Fermi 2. This extrapolation is shown in Table 4.5-3 and resulted in a maximally exposed organ (thyroid) dose of 10.4 mrem/yr and a maximum whole body dose of 1.6 mrem/yr for the maximum annual dose from Fermi 2 gaseous releases.

4.5.3.3 Dose Rate from Liquid Effluents

The Annual Radioactive Effluent Release and Radiological

Environmental Operating Reports for 1999 through 2006 (Reference 4.5-2 through Reference 4.5-9) explicitly state that “there were no releases of liquid radioactive effluents,” and furthermore that “there has not been a liquid radioactive discharge from Fermi 2 since 1994.” As such, the dose rate from liquid effluents is not expected to be a factor in the cumulative dose to construction workers.

4.5.4 Construction Worker Dose Estimates
The overall estimate of dose to construction workers considers an occupational exposure period of 2600 hours per year, and a construction work force of approximately 2,900. All annualized dose estimates developed in this section are based on a 2080-hour year. Contributions from each type of source are developed below and a total estimated dose is provided in the conclusions.

4.5.4.1 Dose Estimate from Direct Radiation Sources As described in Subsection 4.5.3.1, a dose rate of 24.6 mrem/yr for the Fermi 3 construction area is used to estimate the annual dose to construction workers from –16 skyshine radiation. Fermi 2 utilizes hydrogen water chemistry, which results in elevated skyshine doses. As described in Subsection 4.5.2.1, the contribution to the total dose estimate for construction workers from the condensate storage tanks and the onsite storage facility are negligible.

4.5.4.2 Dose Estimate from Gaseous Effluents Table 4.5-3 provides the estimated bounding dose of 10.4 mrem/yr to a maximally exposed organ (thyroid) and whole body dose of 1.6 mrem/yr from gaseous effluents.

4.5.4.3 Dose Estimate from Liquid Effluents
Liquid radioactive effluents from Fermi 2 can be released to Lake Erie via the circulating water reservoir blowdown line. However, there have been no liquid radioactive effluent releases from Fermi 2 since 1994. As such, the dose estimate from liquid effluents is negligible.

4.5.5 Summary and Conclusions
The annual dose to an individual construction worker from all three pathways is summarized in Table 4.5-4 and compared to the public dose criteria in 10 CFR 20.1301 and 40 CFR 190 in Table 4.5-5 and Table 4.5-6, respectively. Because the calculated doses meet the public dose criteria of 10 CFR 20.1301 and 40 CFR 190, the workers would not need to be classified as radiation workers and no shielding or other protective measures are required. Table 4.5-7 shows that the doses also meet the design objectives of 10 CFR 50, Appendix I, for gaseous and liquid effluents. The maximum annual collective dose to the construction work force (2900 workers) is estimated to be 76 person-rem. It is concluded that annual construction worker doses attributable to the operation of Fermi 2 for the Fermi 3 construction areas would be SMALL because it would be a fraction of 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required.

Construction workers will be treated as if they were members of the

general public in unrestricted areas.

4.7.7 Radiological Impacts
This impact analysis is limited to the Fermi site during construction of Fermi 3 and is based on continuing operation of Fermi 2. No other significant radiological sources are present in the region nor are new radiation sources (other than Fermi 3) known as possibly occurring in the region. During construction of Fermi 3, construction workers onsite will be exposed to low-level radiation doses from the continued operation of Fermi 2 (Subsection 4.5.5). Doses were calculated based on exposure to direct radiation, gaseous effluents and liquid effluents likely to occur during ordinary plant operations. The total individual dose received during the construction period from all onsite sources is summarized in Table 4.5-5 relative to public dose criteria. This data indicates that construction workers would not be classified as radiation workers. Based on available data reviewed, dosage levels would be low, averaging 26 percent of the maximum allowable dose (Table 4.5-5). Exposure to construction workers experiencing annual doses attributable to operation of Fermi 2 would be SMALL because exposure would be within 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required. Construction workers will be treated as if they were members of the public in unrestricted areas. Access to restricted areas generally will not be provided to construction workers. Radiological impacts to workers and the public will be SMALL, and no mitigative measures are needed.

DTE acknowledges that construction workers could be exposed to radiation from a range of sources including direct radiation, radiation from gaseous effluents, and radiation from liquid effluents associated with the normal operation of Fermi 2. (4.5.2 Radiation Sources)

Petitioners take issue with the conclusions stated (4.7.7 Radiological Impacts): “It is concluded that annual construction worker doses attributable to the operation of Fermi 2 for the Fermi 3 construction areas would be SMALL because it would be a fraction of 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required.”

Clearly the accumulative doses discussed above with all of the separate pathways of ingestion and from multiple sources indicates that workers will be getting exposed to considerable radiation. Beir VII concludes that no exposure to radiation is without an associated risk. There is no safe level of exposure.

Petitioners’ Analysis

Routine radioactivity releases from Fermi 3 would harm human health. Even new reactors like Fermi 3 will release significant amounts of radioactivity directly into the environment. These would include so-called "planned" and "permitted" releases from the reactor's "routine" operations, as well as unplanned releases from leaks and accidents. Atomic reactors are designed to release radioactive liquids and gases

into the air, water, and soil, which can then bio-concentrate in the ecosystem and human bodies. Liquid releases, which at Fermi are discharged into Lake Erie, include tritium, which can incorporate into the human biological system, even down to the DNA level. Once organically bound, tritium can persist in the human body for long periods, emitting damaging radioactive doses. Tritium can cross the placenta from mother to fetus. Current radiation health standards are not protective of women, children, nor fetuses. The Institute for Energy and Environmental Research has launched a campaign called "Healthy from the Start," which urges NRC, EPA, and other agencies to protect the more vulnerable "Reference Pregnant Woman" from such radioactive hazards as tritium, rather than "Reference Man" as is currently done. The State of Colorado has instituted a tritium regulation 40 times stronger than the federal standard; California has a 50-fold stronger standard. Michiganders deserve equally strong protection.

Large-scale accidental tritium leaks into groundwater in Illinois, that had been covered up for a decade by the nuclear utility and state environmental agency, were uncovered in early 2006 by a concerned mother whose daughter had contracted brain cancer at age 7. A cluster of rare childhood brain cancers were then documented in the community of Morris, Illinois, home to three atomic reactors and a high-level radioactive waste storage facility. The scandal led to the revelation of widespread accidental tritium releases nationwide at almost all atomic reactors. Accidents at atomic reactors can lead to the large-scale release of harmful radioactivity into the environment. For example, the turbine explosion at Fermi 2 reactor on Christmas Day, 1993 led to DTE's release of two million gallons of radioactively contaminated water into Lake Erie. A new reactor at Fermi will effectively double such accident risks: "break in phase" accident risks at the new Fermi 3 reactor, and "break down phase" accident risks at the deteriorated, old Fermi 2 reactor. Incredibly, Fermi 1 experienced an accidental release of thousands of gallons of tritium-contaminated water in 2007, 35 years after the reactor had been permanently shut down! The nearby Davis-Besse reactor also recently admitted tritium leaks into the environment.

Radioactivity releases occur not only at reactors, but at every step of the nuclear fuel chain. Accurate accounting of all radioactive wastes released to the air, water and soil from the entire reactor fuel production system is simply not available. The nuclear fuel chain includes uranium mines and mills (often located near indigenous peoples communities), chemical conversion, enrichment and fuel fabrication plants, reactors, and radioactive waste storage pools, casks, trenches and other dumps. Fermi 3 would increase the risk that new uranium mining in the Great Lakes basin, such as at Eagle Rock near Marquette and the Keweenaw Bay Indian Community in Michigan’s Upper Peninsula, would go ahead.

As confirmed for the seventh time by the U.S. National Academy of Sciences in 2006 in its “Biological Effects of Ionizing Radiation” report (BEIR VII), every exposure to radiation increases the risk to human health. Radioactivity can damage tissues, cells, DNA and other vital molecules, potentially causing programmed cell death (apoptosis), genetic mutations, cancers, leukemias, birth defects, and reproductive, immune, cardiovascular and endocrine system disorders.

A new reactor at Fermi would add to the cumulative impact of such “routine releases” already occurring at operating atomic reactors, namely Fermi 2 and Davis-Besse, on Lake Erie’s shallow, fish-rich western basin.

Fermi 2’s operations are correlated with local increases in cancer rates and other diseases, a radioactive health risk that Fermi 3 would make even worse. Janette Sherman, MD of the Environmental Institute at Western Michigan University published “Childhood Leukaemia Near Nuclear Installations” in a recent edition of the European Journal of Cancer Care. Using mortality statistics from the U.S. Centers for Disease Control and Prevention, Sherman examined data from 1985-2004 and determined that when measured against background levels in the rest of the U.S., leukemia rates have increased for children that live near nuclear reactors. She found an increase of 13.9% near nuclear plants started up between 1957-1970 (oldest plants); an increase of 9.4% near nuclear plants started up between 1971-1981 (newer plants); and a decrease of 5.5% near nuclear plants started up between 1957-1981 and later shut down.

Joseph Mangano of the Radiation and Public Health Project has documented that in the early 1980's, before Fermi 2 began operating in 1988, the Monroe County cancer death rate was 36th highest of 83 Michigan counties. But by the early 2000's, it had moved up to 13th highest. From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S. rate. The energy efficiency and renewable alternatives to Fermi 3 do not involve such radioactive health risks.

The NRC should address the additional radioactivity exposures caused by discharges from the burning of coal at Monroe County’s two fossil fuel plants. Radiation monitoring should be installed at those facilities. The cumulative impacts and incremental changes caused by a new reactor should be evaluated.

Petitioners request that an ASTDR Health Consultation be conducted because of the significant increase in cancer and it needs to be evaluated.

Eartha Jane Melzer (11 / 12/08) wrote in the Michigan Messanger:
Childhood leukemia rates are higher for kids who live near old nuclear power plants.

Janette Sherman MD of the Environmental Institute at Western Michigan University and Joseph Mangano of the Radiation and Public Health Project are authors of “Childhood Leukaemia Near Nuclear Installations” published in the current edition of the European Journal of Cancer Care.
Using mortality statistics from the U.S. Centers for Disease Control and Prevention, Sherman and Mangano examined data from 1985-2004 and determined that when measured against background levels in the rest of the U.S. leukemia rates have grown for kids that live near nuclear reactors.

They found:

- An increase of 13.9% near nuclear plants started 1957-1970 (oldest

plants)
- An increase of 9.4% near nuclear plants started 1971-1981 (newer plants)
- A decrease of 5.5% near nuclear plants started 1957-1981 and later shutdown.

Michigan has four nuclear power reactors: Fermi 2, in Monroe, built in 1985, DC Cook 1, and 2 south of Benton Harbor, built in 1974 and 1977 and Palisades near South Haven, built in 1971.

“While it is feasible that higher emissions of radioisotopes into the environment from older plants may account for the observed trends, caution should be used when interpreting the data,” the researchers wrote. “There may be demographic differences between the two groups that can include factors affecting mortality risk such as poverty, proximity to medical facilities and presence of other environmental pollutants.” Childhood leukemia rates are higher for kids who live near old nuclear power plants.

Public health expert urges examination of cancer rates around Fermi nuke plant.
By Eartha Jane Melzer (1/21/09) Michigan Messanger

As the Nuclear Regulatory Commission begins a public comment period on the permit application for a new reactor at the DTE Energy’s Fermi complex in Monroe, a public health expert is warning that a rise in cancer rates in Monroe County appears to be linked to operations at the existing 1,130 megawatt nuclear reactor.

In a statement submitted to the NRC at a public hearing in Monroe last Joseph Mangano, a public health administrator and researcher with the Radiation and Public Health Project, said that data from the Centers for Disease Control shows an increasing cancer death rate, particularly among children, since Fermi 2 became operational in the late 1980's.

Mangano said:

> “Because Monroe County has a low risk population that is well educated, high income, and has few language barriers, rising cancer rates are unexpected, and all potential causes should be investigated by health officials.”

> Fermi 2 reactor began “operating” June 21, 1985. However, it ran very little after the initial low-power start-up until a warranty run in January of 1988, marking the commercial start-up of the reactor. In the early 1980s, the Monroe County cancer death rate was 36th highest of 83 Michigan counties, but by the early 2000s, it had moved up to 13th highest. From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S.

All nuclear reactors produce electricity by splitting uranium atoms, which creates high energy needed to heat water. This process also creates over 100 radioactive chemicals, not found in nature, including Strontium-90, Cesium-137, and Iodine-131.

While most of these chemicals are retained in reactors and stored as waste, a portion is routinely released into the local air and water. They enter human bodies through breathing and the food chain, and raise cancer risk by killing and injuring cells in various parts of the body. They are especially harmful to children."

Petitioners request

1) that an ASTDR Health Consultation be conducted because of the significant increase in cancer and it needs to be evaluated;
2) that baseline epidemiological studies be conducted and update annually;
3) that workers be monitored for their exposure;
4) that the practice at the plant be ordered that workers shall carry two TLD's, one for DTE review and one for Labor Union review;
5) that workers be screened bi-annually for cancers of the blood and screened for cancer markers;
6) that worker records be kept in a transparent and auditable manner, and that those records be made known to workers individually and to the public collectively;
7) that Potassium Iodide be provided to workforce and to the public so that I-131 uptake into thyroid gland can be minimized;
8) that Cancer Awareness programs and General Education programs be provided to workforce and to the Community of Monroe;
9) that "Dilution as the Solution to Pollution" be recognized as unacceptable practice;
10) that effluent limits be adhered to and not methodologically rigged to relax standards;
11) that operation of Fermi 3 complies with all radiological standards established, and that the NRC does not grant waiver, relaxation, exemption, and or methodological manipulation to conceal true and accurate radiological reporting.

The International Joint Commission has called for virtual elimination of persistent toxic chemicals and has identified several radio nuclides as such. Virtual Elimination is Zero. Zero discharge is acceptable. The goal is Zero. While the NRC sets permissible levels of radiation expose and discharge and reporting tends toward perfunctory "below permissible levels" the accumulative impact is very significant. Radio nuclides bio-accumulate and the bio-concentrate in the food chain. Virtual Elimination is the standard called for by the International Joint Commission. Petitioners request that both the regulator and the regulated pursue this target.

CONTENTION NO. 8: Threatened and Endangered Species have not been properly mitigated

There are four endangered and threatened animal species on proposed Fermi 3 site. There are three species of threatened plants. Based on the review by the the Wildlife Division of the Michigan Department of Natural Resources Petitioners have reason to believe that... "going forward with the construction (of Fermi 3) would not only kill snakes but destroy the habitat in which they live and possibly exterminate the species from the area." (Letter from Lori Sargent 2/9/09 to Fermi3 COLEIS appears below).

Petitioners hold that inadequate mitigation has been considered.

Petitioners hold that the EPA has stated: "EPA encourages selection of alternatives with the least impact to wetlands. Therefore, we recommend a complete evaluation of the wetlands impacted by each feasible alternative site. We also encourage facility footprints within the plant site that will avoid minimize wetlands impacts. If there are wetlands impacts, we recommend characterization and mitigation information be included in the EIS and not deferred to the permit stage." (Letter from EPA 2/9/09 to Fermi3 OLEIS Excerpts appear below)

Petitioners assert that: Alternatives have not been given the requisite “hard look” and as a result several species are threatened and endangered. Alternatives must be examined and in the event that Fermi 3 is pursued mitigative measures must be taken.

Supporting documents:

Lori Sargent Wildlife Biologist with The Wildlife Division of the Michigan Department of Natural Resources wrote:

Sent: Monday, February 09, 2009 2:02 PM
To: Fermi3COLEIS Resource
Subject: Comments to Environmental Report

Thank you for the Fermi 3 Combined License Application, Part 3: Environmental Report. A response to a threatened/endangered species review of the Fermi 3 proposed project in Wayne County, Michigan was sent from this office to the Black &
Veatch Corporation November 28, 2007. In that response four endangered or threatened animal species were
listed as being present in the area as were three species of threatened plants. Upon review of this report I
noticed some discrepancies and causes for concern in regard to threatened species protection.

One animal species that is of primary concern in the area is the Eastern fox snake (Pantherophis gloydi). On page 2-333 of the Environmental Report it states that “nine occurrences were reported in Monroe County…the snake was sighted two times on the Fermi property in June 2008.” There is a discrepancy to this statement on page 4-45 where it states “The eastern fox snake (a Michigan threatened species)

has not been observed on the Fermi property, but the potential for its occurrence on the property does exist.”

According to our records there is a viable population of Eastern fox snake at the site of the proposed project. We believe that going forward with the construction would not only kill snakes but destroy the habitat in which they live and possibly exterminate the species from the area.

We would like to see a plan for protection of this rare species with regard to this new reactor project.

Please contact me if you have questions or concerns. Thank you.

(hard copy sent through mail)

NOTE: An e-mail will get a quicker response from me than voicemail in most cases

Lori Sargent
Nongame Wildlife Biologist
Wildlife Division
Michigan Dept. of Natural Resources
PO Box 30180
Lansing, MI 48909

Following the EPA site visit and review of the scoping request, Anna Miller of NEPA (Implementation Office of Enforcement and Compliance Assurance U.S. EPA-Region 5(E-19J)) offered on February 9, 2009 (Fermi3COLEIS) the following recommendations for the scope of the EIS, which are in addition to federal guidance regarding EIS preparation and scope in general.

The ..."EPA encourages selection of alternatives with the least impact to wetlands. Therefore, we recommend a complete evaluation of the wetlands impacted by each feasible alternative site. We also encourage facility footprints within the plant site that will avoid minimize wetlands impacts. If there are wetlands impacts, we recommend characterization and mitigation information be included in the EIS and not deferred to the permit stage."

CONTENTION NO. 9: The Commission must require completion of an EIS and selection of a 'preferred alternative' prior to authorizing any construction activity of any sort

Background

In 2007 the Nuclear Regulatory Commission promulgated a new, de-regulated definition of "construction" as that term applies to the building of new nuclear power plants. Under the new 10 C.F.R. § 50.10(a)(2), the following activities were relieved of all NRC over-sight:

> Site exploration
> Procurement
> Logging, clearing of land, grading
> Excavation for any structure
> Fabrication at other than the final onsite, in-place location (modules)

At the same time, the "limited work authorization" - the first point at which NRC "build" authority must be sought - was moved higher/later in the licensing continuum. The "new" LWA list of allowable activities contained in the revised 10 C.F.R. § 50.10(d)(1) includes:

> Driving of pilings
> Subsurface preparation
> Placement of backfill, concrete, or permanent retaining walls
> Installation of foundation

The drastic alteration of the meaning of "construction" circum-vents NEPA. By allowing excavation activity, for example, the utility commences an irretrievable commitment to a large, baseload plant, probably nuclear-fired, long before the completion of an Environmental Impact Statement which seriously considers reasonable alternatives. This manifests an undeniable bias toward central baseload plant construction and precludes substantive consideration of any other decentralized alternatives such as wind, solar, geothermal and energy

conservation. Allowing *any* construction at the proposed Fermi 3 site cements - figuratively and literally - the *de facto* selection of a central baseload nuclear power plant as the selected project alternative, literally years before completion of an EIS, which is the legal stage at which selection of a preferred alternative is first authorized.

If the Commission were to allow any acts of construction to proceed before the end of the NEPA process, that is illegal because it is contrary to NEPA and would deprive the public of the benefit of the procedural protections of federal law. The NRC's revamping of its definition of "construction" comprises a denial of due process under NEPA and is illegal and unconstitutional as applied.

For all actions "significantly affecting the quality of the human environment," the federal agency must provide a detailed statement on the "environmental impact of the proposed action," alternatives to the proposed actions, and any "irreversible and irretrievable commitments of resources" that would occur with implementation of the action. 42 U.S.C. § 4332(2)(C). The Environmental Impact Statement must contain a "full and fair discussion" of significant environmental impacts that is "supported by evidence that the agency has made the necessary environmental analyses." 40 C.F.R. § 1502.1. The discussion must include an analysis of the direct, indirect, and likely cumulative impacts of the proposed action. See 40 C.F.R. §§ 1508.7, 1508.8, 1508.25.

Federal agencies also must analyze and discuss "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c). With respect to Fermi 3, "significant new information" could mean the dramatically-changing economic climate in Michigan as it occurs in the

coming months and years before the EIS is completed. It could also include the dramatic shifts in the economics of wind power, conservation, and solar photovoltaic technologies, which literally are becoming less expensive week-by-week.

To satisfy NEPA, the NRC must demonstrate it has taken a "hard look" at the environmental consequences of the proposed action. "To comply with NEPA's 'hard look' requirement an agency must adequately identify and evaluate environmental concerns." *Friends of the Bow v. Thompson,* 124 F.3d 1210, 1213 (10th Cir. 1997). This means that "NEPA procedures must insure that environmental information is available to public officials and citizens ***before decisions are made and before actions are taken*** [emphasis supplied]. . . Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." *Id.* § 1500.1(b). NEPA's emphasis on "the importance of coherent and comprehensive up-front environmental analysis. . . ensure[s] informed decision-making to the end that the agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Blue Mtns. Biodiversity Project v. Blackwood,* 161 F.3d 1208, 1216 (9th Cir. 1998).

If DTE were allowed to irretrievably commit to the project by investing in partial construction of it prior to completion of an EIS, then the NEPA portion of the Combined Operating License process would be rendered meaningless. Congress promulgated NEPA to ensure that federal projects were not initiated until an accurate assessment of the project's impact on the environment was complete. *Vermont Yankee Nuclear Power Corp. v. National Resources Defense Council, Inc.*, 435 U.S. 519, 558 (1978) (finding Congress passed NEPA to ensure that

federal agencies consider the environmental consequences of proposed actions during the decision-making process, thereby insuring "fully informed and well-considered" decisions); *Massachusetts v. Watt*, 716 F.2d 946, 953 (1st Cir. 1983) ("[NEPA's] purpose is to require consideration of environmental factors before project momentum is irresistible, before options are closed, and before agency commitments are set in concrete" (quoting W. Rogers, Environmental Law § 7.7 at 767 (1977)); *Arlington Coalition on Transp. v. Volpe*, 458 F.2d 1323, 1333 (4th Cir.) (stating that the "purpose of NEPA [is] to insure that actions by federal agencies be taken with due consideration of environmental effects"), *cert. denied sub nom. Fugate v. Arlington Coalition on Transp.*, 409 U.S. 1000 (1972).

An agency's failure to follow the procedural requirements of NEPA, in and of itself, constitutes irreparable injury. See *Town of Golden Beach v. Army Corps of Engineers*, 1994 U.S. Dist. LEXIS 15832, *25-26, 40 Env't Rep. Cas. (BNA) 1094 (S.D. Fla. 1994) ("With regard to the balancing of irreparable injuries, it is clear that where there is a fundamental breakdown in the NEPA process. . . preliminary injunctive relief is appropriate"); *Protect Key West, Inc. v. Cheney*, 795 F.Supp. 1552, 1563 (S.D. Fla. 1992) (granting an injunction based on the inadequacy of the agency's EA because "[i]rreparable harm results where environmental concerns have not been addressed by the NEPA process"); see also *Sierra Club v. Marsh*, 872 F.2d 497, 499-505 (1st Cir. 1989) (affirming injunction based on NEPA procedural lapse because "risk implied by violation of NEPA is that real environmental harm will occur through inadequate foresight and deliberation").

To avoid harm to the public's interest in participation in this

very momentous choice of energy alternatives, it is incumbent upon the Commission to ensure that there is no construction activity whatsoever undertaken prior to completion and finalization of the Environmental Impact Statement and selection of a preferred alternative.