



Response to Comments

Project: FirstEnergy Bayshore Plant, National Pollutant Discharge Elimination System (NPDES) Permit

Ohio EPA ID #: 2IB00000

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Ohio EPA held a public hearing on April 22, 2010, regarding FirstEnergy Bayshore Plant's National Pollutant Elimination System (NPDES) Permit. This document summarizes the comments and questions received at the public hearing and/or during the associated comment period, which ended on June 1, 2010.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. For example, concerns about zoning issues are addressed at the local level. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format.

Comments on Impingement/Entrainment of Fish and Resource Damages

Comment 1: Ohio EPA should require Bayshore/FirstEnergy to count, weigh and report the fish they kill on a daily basis. Ohio EPA should also set daily maximum fish kill limits, similar to those set by the Army Corps of Engineers for the Thurmond Dam power plant in Georgia and South Carolina, where the plant must close when kills exceed a certain number in a day. Ohio EPA should impose these limits until cooling towers are installed.

Response 1: FirstEnergy conducted impingement and entrainment (I/E) sampling in 2005 and 2006, and will be required to conduct follow-up sampling after improvements are installed at the facility to reduce I/E. The Clean Water Act provides authority for Ohio EPA to require FirstEnergy to utilize the “best technology available” for minimizing adverse environmental impact (i.e., minimizing impingement and entrainment losses). As a result, the Bayshore permit requires that FirstEnergy make improvements which will achieve specified reductions in I/E. Compliance with these reductions will be based on the follow-up sampling conducted after the improvements are installed. (See response #6 and response #10.)

With regard to daily maximum thresholds for fish killed, such limits are difficult to establish due to variability in the numbers of fish in the intake channel and are also expensive to implement due to the need for daily sampling.

Comment 2: The Ohio EPA should put a realistic price tag on the losses of fish and other aquatic wildlife due to impingement and entrainment (I/E), and require annual compensation payments, regardless of what technology is ultimately permitted. Without an economic incentive and the associated long term costs to power generation, innovative and effective means to reduce fish kills at these facilities are unlikely.

The Ohio Department of Natural Resources (ODNR) should charge natural resource damages to Bayshore for the fish killed, with the funds benefiting the Maumee River, Maumee Bay, and western Lake Erie, until such time as Bayshore installs and operates the best available technology to reduce the fish kills.

With the exception of facilities with intake structures, all entities that impact fish pay for licenses to fish, with rules on sport fish size, number and restrictions regarding when to fish. Also, businesses and others pay natural resource damages if there are

accidental spills. Why is the Bayshore facility allowed to kill so many fish and pay nothing for the kills and damages?

Response 2: Ohio EPA does not have the authority to require payment for the number of fish impinged and entrained by the Bayshore Plant. While the Ohio Department of Natural Resources (ODNR) can require payment for natural resource damages, fish mortality due to I/E at a cooling water intake structure is normally addressed through the Clean Water Act requirement of utilizing best technology available. (See response #1.) We are not aware of any state requiring payments for fish losses due to I/E based upon a determination of natural resource damages. In addition, any study designed to determine natural resource damages would need to evaluate fish population impacts from I/E. Since fish population can be affected by a number of factors, and can be quite variable from year to year, such a study would be quite costly and difficult to perform.

Comment 3: **The Bayshore power plant should be held accountable and fined the proper amount for all fish killed, including juvenile and larval fish that have been entrained, as well as natural resource damages. The fine money should then be used to restore prized sportfish in the Maumee River and Bay.**

Response 3: The Ohio Administrative Code does not provide authority for Ohio EPA to impose this type of requirement. (See also response #2.)

Comment 4: **If FirstEnergy was forced to internalize the externalities of Bayshore's electric generation (i.e pay restitution to the state and the people of Ohio for killing fish by the millions, for a minimum), there would be no question as to whether an increase in upfront costs to site and operate cooling towers would be outweighed by the environmental benefit.**

Response 4: The fishery in Lake Erie's western basin is undoubtedly a very valuable resource, not only because of the fish which live and grow in this portion of the Lake, but also due to the significant economic activity associated with the fishery. However, a detailed cost-benefit analysis would be required to properly compare the costs of cooling towers to the benefits of reducing I/E losses and reducing the thermal discharge by constructing cooling towers. The Clean Water Act does not require a cost-benefit analysis, but instead requires the application of best technology available, regardless of the costs versus the benefits of reducing fish losses. (See response #6.)

Comments on Requirements for I/E Reduction, including Cooling Towers

Comment 5: Ohio EPA should set the standard for fish reductions at 90% for impingement and 80% for entrainment, which are the upper limits suggested by U.S. EPA, rather than the lower limits proposed in the draft permit.

There is no basis for the draft permit's inclusion of a performance standard of 80% reduction in impingement and 60% reduction in entrainment.

Response 5: The reduction percentages in the permit represent the lower ranges for the I/E national performance standards in the federal rules which were adopted in 2004, and subsequently suspended in 2007. We believe that the percentages in the permit are consistent with the requirements in the suspended federal rules, and will result in significant improvement with regard to I/E losses at the Bayshore facility.

Comment 6: Cooling towers are the best technology available for minimizing adverse environmental impact, as required by the Clean Water Act. Cooling towers can reduce both impingement and entrainment by 90%, as well as thermal pollution. According to the 2009 report by the consultant TetraTech, three mechanical draft cooling towers can be placed just north of the City of Oregon's wastewater treatment plant and just south of the current coal pile storage without significant disruption to facility operations or local activities.

Response 6: The Clean Water Act requires that facilities use the best technology available to minimize adverse environmental impact from cooling water intake structures. The federal regulations for existing power plants adopted in 2004 established a closed-cycle recirculating system (or cooling towers) as one of the alternatives for compliance. However, these regulations also established national performance standards for I/E reduction, and allowed facilities to comply by installing other equipment and/or making operational changes which would meet the performance standards. Using best professional judgment, Ohio EPA used the latter approach and included language in the Bayshore permit which allows considerable flexibility to FirstEnergy. The Bayshore facility must meet performance standards for I/E reduction by April 2013, but the company can comply with these reductions by choosing a number of alternatives, including cooling towers.

Comment 7: The cost of the loss of the fish on an annualized basis as determined by the Gentner Consulting Group is \$29.4 million a year without assessing other associated economic losses. The \$29.4 million annual cost justifies putting in cooling towers which are estimated to cost \$92 million.

Taken together with TetraTech's finding that wet cooling towers are the only cost-effective measure available to Bayshore for compliance with Section 316(b) of the Clean Water Act, Ohio EPA should require now, without further delay, that wet cooling towers (or an equivalent technology that is at least as effective) represent best available technology (BAT) for Bayshore's cooling water intake structure.

Response 7: See responses #4 and #6.

Comment 8: The only viable way to reduce the fish losses due to the operation of cooling water intake structure (CWIS), and reduce the warm water discharge that enhances algae blooms is to install cooling towers.

Response 8: See responses #6, #26, and #29.

Comment 9: Instead of installing new technology that's very expensive, wouldn't it be better to spend a hundred million dollars on efficiency, reducing the need for the boilers to be running, therefore reducing fish kills, and lowering rates at the same time?

Response 9: Improved efficiency of electricity generation would certainly be a worthwhile and important objective for all power plants. However, Ohio EPA does not have the authority to mandate such requirements.

Comments on Other Options for Reducing I/E, including Louvers

Comment 10: Ohio EPA's consultant TetraTech said that while louvers are logistically possible, they will not deliver satisfactory performance. With this information, why did Ohio EPA public notice a draft permit with louvers as the impingement/entrainment technology? Also, louvers are species specific – there are over 100 species of fish killed at Bayshore. Louvers are just a cheap way to buy time until Ohio EPA makes the company do something else.

Louvers are for adult and juvenile fish only and have to be installed in very specific location. Bayshore is not a location where louvers will work.

Louvers, which have no track record to reduce fish kills in fresh water coal-fired power plants, should be determined by Ohio EPA to be unacceptable as recommended by Ohio EPA's own consultant.

Response 10: When TetraTech evaluated louvers for possible use at the Bayshore facility, they rejected this technology. Although louver systems have been effective in reducing impingement losses at hydro-electric facilities, they are not satisfactory with regard to entrainment. It is true that the success of louver systems is species-dependent, and there are many other factors which determine the success or failure of this technology.

FirstEnergy conducted a pilot test of the louver system earlier this year and installed a fine mesh screen behind the louver array in order to address entrainment losses. Ohio EPA staff has raised concerns that the pilot test design and sampling data collected during the pilot test will not provide an accurate prediction of the performance of the full-scale louver system. Ohio EPA staff has also raised concerns that the full-scale louver system will not meet the required entrainment reductions.

The decision to pursue this technology (i.e., installation of reverse louvers and fine mesh screen) to comply with the NPDES permit, however, is the responsibility of FirstEnergy. The NPDES permit requires FirstEnergy to meet the I/E reductions by April 1, 2013, but does not specify how First Energy must meet those reductions.

If FirstEnergy chooses the reverse louver system and Ohio EPA approves the permit-to-install for this technology, Ohio EPA will not make any conclusions regarding the performance of the reverse louver system and the ability of this system to meet the I/E reductions required in the NPDES permit. The NPDES permit requires First Energy to monitor the I/E mortality beginning in April 2013, and this monitoring will be used to determine compliance with the permit.

Assuming FirstEnergy proceeds with installation of the reverse louver system, an important aspect of this monitoring will be evaluation of the survival rates for entrainment associated with the fine mesh screen. In addition, compliance monitoring must include an assessment of mortality losses associated with reintroduction of both fish and larvae back into the thermal plume discharged from the facility. (See response #48.) If FirstEnergy does not meet the I/E percent reductions in the permit for

impingement and entrainment, the company will be in violation of its permit.

Comment 11: The installation of louvers is worth the effort. Their effectiveness will only be proven after they are installed and operational, and data is analyzed. How much will it increase the lake walleye population? It will most likely be negligible due to all the other factors. There must be a means of proving their effectiveness to warrant future expenditures of monies.

Response 11: (See response #10.)

Comment 12: The Draft Permit's provisions allowing FirstEnergy to experiment with a pilot project for an unproven compliance option, then to install an option that reduces impingement only by 80% and entrainment only by 60%, fall far short of ensuring that FirstEnergy complies with the BAT provision in Clean Water Act Section 316(b).

Response 12: See responses #6 and #10.

Comment 13: The sediments filling the intake canal reduce the volume of water and increase the velocity. One immediate aid to the fish could be to require that the Bayshore facility increase the depth of the intake channel which would allow the fish a better chance of survival.

Response 13: Increasing the depth and/or the width of the intake channel would reduce velocity in the area where modifications were made, and could be beneficial. However, such improvements would be costly to implement and their effectiveness is unclear.

Comment 14: Ohio EPA and the Ohio Department of Natural Resources (ODNR) recommended that Bayshore close 3 of the 4 generating units during spawning season. Closure during spawning season should be a permit condition.

Response 14: Ohio EPA and ODNR did encourage FirstEnergy to consider shutting down generating units 2, 3 and 4 during the spring spawning season to reduce entrainment losses. However, FirstEnergy has maintained that the dispatch of power from the facility is controlled by an independent operator which manages the electric power distribution in the Midwest; therefore, FirstEnergy stated that it does not have the ability to shut down these generating units as Ohio EPA requested.

Comment 15: The bypass channel proposed for the reverse louver project would have to discharge into an area with cooler water. Otherwise, the effects will be lethal for any larval fish.

Response 15: We agree that the ultimate success of the reverse louver system (as well as any fish return system) is dependent upon the location from which the fish are discharged. If water temperatures at the discharge location (due to the thermal discharge) are significantly higher than the temperature of the water in the intake channel, the fish will likely become stressed which may contribute to mortality.

Comments on the Mercury Variance

Comment 15: FirstEnergy's requested variance from compliance with permit limitations based on Lake Erie Water Quality Standards ("WQS") for mercury should be denied because the company has failed to provide adequate support for the contention in its variance application that it is unable to meet the WQS without end-of-pipe treatment to remove mercury from the effluent.

Response 15: The development of the mercury variance has been predicated on the conclusion that source reduction should decrease mercury concentrations in wastewater discharges. However, it is not known whether source reduction can meet the water quality standard (WQS) for mercury. Even though FirstEnergy has proposed a strategy for reducing the mercury discharge, the success of this strategy is not guaranteed. There is a limited amount of experience to draw upon from other facilities which have attempted to reduce mercury concentrations through implementation of best management practices (BMPs) and pollutant minimization programs.

Comment 16: It is a perverse disincentive for any company to be told there is a water quality standard of 1.3 nanograms per liter (ng/l) that exists to protect human health and wildlife, however, you are not required to meet it.

Response 16: Establishing a discharge limit which is lower than the existing discharge concentration does provide a good incentive for a facility to reduce the discharge of a pollutant. For most pollutants as necessary, Ohio EPA establishes a permit limit which will meet water quality standards in the receiving waters, then allows sufficient time (perhaps two to three years) to meet this limit if the current discharge exceeds the limit.

Ohio EPA, as part of the development of the mercury variance procedures, determined that following a similar approach for mercury was not feasible because cost-effective treatment options were not available for mercury. As a result, the general mercury variance was developed.

Comment 17: Within a year from the effective date of the permit, FirstEnergy should be required to evaluate each of the options enumerated in the proposed mercury variance plan of study to determine potential mercury reductions and costs, and to have actually achieved measurable mercury emissions reductions within two or three years. The permit should include a statement that the mercury variance for the Bayshore plant will not be renewed in the absence of substantial reductions in the levels of mercury emitted to the waters of the Maumee Bay.

Response 17: Rule 3745-33-07 of the Ohio Administrative Code (OAC), which provides the authority for granting a mercury variance, does not require goals with lower mercury discharge concentrations as the PMP is implemented. Instead, information must be submitted annually showing mercury concentrations of the wastewater prior to any treatment, and also immediately before discharge to state surface waters. The implementation of the plan of study and resulting PMP, as required by the regulation cited above, is designed to reduce mercury concentrations over time, and is expected to achieve reductions. However, we do not know how quickly this will occur. (See response #15.)

As the plan of study and pollutant minimization program (PMP) for the variance is implemented, we would expect the discharge concentration for mercury to decrease. If FirstEnergy determines that Bayshore is unable to meet the water quality standard for mercury when the permit is renewed in five years, the new variance-based limit would be calculated using the more recent discharge data, which we hope will result in a lower mercury limit than currently proposed.

For renewal of a mercury variance, permit language requires: 1) all elements of the plan of study and PMP to have been completed; and 2) compliance with an annual average mercury discharge concentration of 12 ng/l, based upon our interpretation of OAC 3745-33-07. The rule does not provide explicit authority to require measurable mercury reductions within two or three years of the PMP implementation. In addition, the uncertainty associated with the success of PMP mercury reduction strategies would make it very difficult to establish permit requirements for two- or three-year mercury reductions, or make variance renewal contingent upon an absolute reduction value. Finally,

timelines for completion of each element of the plan of study have been incorporated into the final permit.

Comment 18: It has been suggested that technology does not exist to meet the mercury water quality standard of 1.3 ng/l; that is not true.

Response 18: Research into mercury removal technologies has been undertaken since the Foster-Wheeler study conducted in 1997 for Ohio EPA. This research is ongoing as a number of companies continue to investigate more efficient approaches for removing mercury. However, the information available to Ohio EPA at this time shows that:

- The efficiency of removal is dependent upon the pollutants in the waste stream. For example, waste streams which are high in chlorides or waste streams containing a high percentage of dissolved mercury tend to present more difficulty.
- Removal technology currently being considered is typically evaluated for relatively low flow rates (i.e., much less than one million gallons per day).
- Vendors for mercury removal technology are generally unwilling (and perhaps unable) to guarantee effluent concentrations less than 12 ng/l, and especially less than 1.3 ng/l, based upon the use of their systems.

In summary, we agree that technology for mercury removal has improved and certainly more options are available compared to 1997. However, we also believe that there is currently no proven technology that can reliably remove mercury to concentrations of 1.3 ng/l.

Comment 19: I would support the reduction of mercury from 12 ng/l to 1.2 ng/l providing current technology and science would support achieving levels at or below such a limit. However, since this figure is something to strive for and obtain, it would be foolish to impose a monetary fine on the unobtainable.

Response 19: See response #18.

Comment 20: We understand that Ohio EPA intends to rely on the 1997 rulemaking and study to grant mercury variances to dozens of facilities that discharge into Lake Erie, and we have serious concerns that such reliance is legally and factually unsupported and will create a major obstacle to restoration of the Lake.

The 1997 mercury variance rule as codified clearly places the burden of proof on the permit applicant to provide information, in its application, regarding “whether there are other means by which the permittee could comply with the WQBEL without constructing end-of-pipe treatment.” FirstEnergy’s mercury variance applications...fail to meet the burden required by O.A.C. 3745-33-07(D)(10) of substantiating the company’s entitlement to a mercury variance.

Response 20: Ohio EPA is required to follow the provisions in all applicable laws and regulations, including the currently effective mercury variance rule found in OAC 3745-33-07(D)(10). It is true that much of the current rule became effective in 1997, however, portions of this rule were revised in 2002 and 2007.

Applicants seeking coverage under the mercury variance must submit the information required under paragraphs (D)(10)(a)(i) through (D)(10)(a)(iv) of rule 3745-33-07 of the OAC. Once the application is submitted, it is then the Director’s decision (based upon the submittal) to determine whether or not there are other means by which the permittee could comply with the water quality-based effluent limit (WQBEL). In this case, a review of the application, including influent and effluent data, a discussion of existing programs to identify potential sources of mercury and a description of current practices to manage known sources of mercury, did not indicate that any strategy could be undertaken at this time by the Bayshore facility to guarantee compliance with the WQBEL within a typical time period of two to three years. (See response #15 for a brief discussion of the uncertainty associated with mercury PMPs.)

The conditions of the PMP require prevention of mercury contamination, maximizing the removal capability of the current treatment system, and an evaluation whether mercury in the effluent is suspended and therefore treatable. These evaluations may lead to additional controls in the next permit renewal.

Comment 21: FirstEnergy’s mercury variance applications fail to include a timeline for the implementation of the mercury Pollutant Minimization Plan. Such a schedule is clearly required as part of any mercury variance application. Bayshore should also be required to monitor and study the effectiveness of its Pollutant Minimization Plan, and make that information available to Ohio EPA and the public.

Response 21: See response #17.

Comment 22: With respect to toxic pollutants such as mercury, Clean Water Act Section 301 requires that NPDES permits “shall require application of” Best Available Technology (“BAT”) to reduce pollutant discharges. Technology-based effluent limitations (“TBELs”) are a necessary minimum requirement for a permit “regardless of a discharge’s effect on water quality.” Ohio EPA is under a non-discretionary duty to independently evaluate the available pollutant control technologies and require stringent permit limits. Nor can FirstEnergy and Ohio EPA simply rely on the 1997 Foster-Wheeler study as a substitute for a BAT analysis. Reliance on a 13-year old rulemaking and study is... inconsistent with the Clean Water Act and the non-discretionary mandate to require BAT.

Response 22: We disagree that application of BAT requires a review of end-of-pipe treatment technologies for each NPDES permit where a mercury variance is granted. The application of technology standards was addressed when our mercury variance rules and procedures were adopted. The development of Ohio’s mercury variance rule included an evaluation of the treatability of mercury in the nanogram per liter (ng/l) range, and concluded that existing treatment plants of various types could generally meet 12 ng/l as an annual average; discharge levels lower than 12 ng/l could not be met by treatment because (1) additional treatment could not reliably meet lower limits; and (2) even if reverse osmosis could meet the limit, it could not be added to large numbers of dischargers without causing widespread social and economic impact.

Comments on the Thermal Discharge from the Bayshore Station

Comment 23: The thermal plume study conducted in 2003 is inadequate and needs to be redone if cooling towers are not required.

Response 23: In accordance with requirements established by Ohio EPA in the NPDES permit which became effective on August 1, 2001, the thermal mixing zone study submitted in 2003 defined the edge of the mixing zone based upon locations where the temperature decreased to water quality standards. As a result, the study failed to adequately define the extent of the thermal plume, or the locations where the temperature returned to background levels. The shortcoming in this study may need to be corrected in the future if evidence of more serious thermal impacts becomes available.

Comment 24: The heated/thermal waters from the Bayshore/FirstEnergy power plant prevent the southern shoreline of Maumee Bay from freezing east of the plant to the marina at Maumee Bay State Park - a

distance of over two miles. The heated waters change the ecology, help algae to grow, and deprive people from winter ice fishing, ice skating, and ice boating along the southern shores of Maumee Bay. The thermal discharge from Bayshore needs to be reduced.

Response 24: Ohio EPA acknowledges that the thermal discharge from the Bayshore Plant results in impacts to Maumee Bay and the use of its waters. However, we also believe that justification for reducing the thermal discharge or the size of the thermal mixing zone does not currently exist. (See response #26.)

Comment 25: The warm water discharge of the power plant is blamed for the algae blooms in Maumee Bay. That is not 100% true.

Response 25: See response #29 below.

Comment 26: The draft permit must be substantially revised to ensure that Bayshore's thermal discharges comply with effluent limitations that ensure compliance both with BAT and thermal water quality standards, or an appropriately supported thermal variance that complies with Clean Water Act Section 316(a), U.S. EPA and Ohio implementing regulations, and procedures outlined in applicable agency guidance.

Response 26: Within the last several years, Ohio EPA conducted an evaluation of the thermal discharge to determine whether Ohio water quality standards (WQS) for temperature are being met at the Bayshore facility, and also to determine if justification existed for restricting the size of the thermal mixing zone. Based upon this analysis, we have concluded that Bayshore is in compliance with Ohio WQS for temperature since the WQS apply at the edge of the thermal mixing zone. In addition, after examining characteristics of the thermal discharge in the context of Ohio's rule governing thermal mixing zones, we concluded that restricting the size of the mixing zone was not justified. Based upon these conclusions, there is no need for a thermal variance at this time.

Ohio EPA acknowledges that impacts from the thermal discharge exist (e.g., restrictions on recreational use). As more information pertaining to Maumee Bay becomes available in the future and the science related to algal blooms becomes more advanced, Ohio EPA may revise the conclusions discussed above. (See also response #28.)

Comment 27: The outfall temperature for the cooling water should be limited to no more than 90° Fahrenheit.

Response 27: Water quality standards (WQS) for temperature must be met at the edge of a mixing zone. This provision means that temperatures at the point of discharge from the facility can exceed the WQS since the discharged water will mix with water in Maumee Bay, and release heat to the air, resulting in a lower temperature at the edge of the mixing zone. For this reason, Ohio EPA does not believe there is legal justification for a discharge limit of 90° F. at this time. (See response #26.)

Comment 28: Neither FirstEnergy nor Ohio EPA appears to have ever defined the “balanced, indigenous population” of aquatic species that Clean Water Act Section 316(a) requires in association with thermal discharges. This is a clear requirement of the federal statute, and the failure by either FirstEnergy or Ohio EPA to evaluate this issue means that a renewal of FirstEnergy’s thermal variance would be unreasonable and unlawful.

Response 28: Ohio EPA has never approved a Section 316(a) thermal variance for the Bayshore Power Plant, and the current permit does not include a thermal variance.

Comment 29: The 2009 report prepared by the consultant TetraTech noted that “the existing thermal discharge may conflict with the narrative standards of OAC Rule 3745-1-04 by contributing to the algal blooms that have occurred repeatedly over the last several years.” Ohio EPA does not appear to have evaluated this issue at all in connection with preparation of the draft permit.

Response 29: Ohio EPA has examined this issue in the context of an evaluation of the growth of nuisance species in the thermal mixing zone. (See page 9 in the factsheet which was public noticed with the draft permit in March 2010.) There are many variables to consider when determining if one factor (such as the thermal discharge) may be contributing to algal growth in the immediate area of the Bayshore Power Plant discharge. Warm water can encourage algal growth if there are sufficient nutrients and sunlight with minimal competitive interests. However, warm water in the shallow western basin exists even without the Bayshore discharge. Whether additional warm water makes a difference is a matter of conjecture. Also, some algae are known to grow in cooler waters (even under ice), providing there are sufficient nutrients, and providing sunlight transmits through the ice. Therefore, water temperature is not a contributing factor by itself.

Another consideration is that the Bayshore Power Plant has been operating since the 1950s. During its lifetime of operation, algal blooms in the western basin greatly decreased in the 1980s. So despite the

thermal discharges from the Bayshore Power Plant, algae growth declined.

The invasion of dreissenid mussels in the late 1980s is thought to contribute to the increase of algal blooms by recycling phosphorus already in the lake and making it more bioavailable. We also know that the amount of dissolved phosphorus (bioavailable) contributed from tributaries discharging into the western basin of Lake Erie has been steadily increasing since the mid-1990s, closely tracking the seriousness of algal blooms.

The construction of the confined disposal facility (CDF) may have also contributed to a local problem in the vicinity of the power plant discharge because it prevents circulation that might have dissipated heat, and better mixing of the nutrient and sediment load from the Maumee River. In summary, it is difficult to distinguish the impact of these variables from the impact of a single thermal discharge point source. As a result, we believe that the currently available evidence is inconclusive with respect to the relationship between the thermal discharge and algal blooms.

Comments on the Timetable for Implementing I/E Reductions and Public Participation

Comment 30: Ohio EPA must delay renewal of the Bayshore NPDES permit and give the public the opportunity to comment on any final BAT determination before the permit is issued. The provisions in the draft permit that would appear to allow FirstEnergy and Ohio EPA to implement an as-yet-undetermined BAT compliance option without any further opportunity for public review and comment on the BAT determination run contrary to the Clean Water Act.

Response 30: Using best professional judgment, Ohio EPA has determined that the best technology available (BTA) for the Bayshore Station is represented by the installation of equipment, changes in operating procedures, or any other strategies which result in meeting the required reduction percentages in the permit compliance schedule. We believe that this approach is consistent with the Clean Water Act, and because BTA is based upon meeting reduction percentages regardless of the technology or strategy chosen by the company, the public has in fact had the opportunity to provide comment on the BTA determination for the Bayshore Station. (See also response # 6.)

Comment 31: The term of this permit should be one year, not five years. The proposed fish reduction technology should be subject to public

review and comment. The public should not be shut out of the process.

Ohio EPA should have another public meeting and hearing when Ohio EPA and FirstEnergy agree to the 'best technology' to reduce the fish kills and thermal impacts.

Response 31: See response #30.

Comment 32: **The timetable for installation of the best available technology should be moved up to July 1, 2012, instead of 2014.**

Response 32: The revised compliance schedule in the final permit requires completion of construction and all other improvements to reduce I/E losses by April 1, 2013. Ohio EPA believes that this schedule is reasonable, given the intermediate tasks which must also be completed prior to final installation of improvements.

Comment 33: **The Environmental Protection Agency is not an economic agency, it is an environmental agency. Fish are being killed and the water is being heated. Ohio EPA's job is to address these issues – not in two years, five years or ten years, but now.**

Response 33: See response #32.

Miscellaneous Comments

Comment 34: **What I would implore the agency to do is to continue to work with FirstEnergy and ODNR like you have been doing to come up with a common sense solution. I encourage you look at the whole picture, including the affordability of a six and a half percent increase in our electric rates.**

Response 34: Ohio EPA is required to develop a permit which complies with all applicable laws and rules. Within this framework, the NPDES permit allows FirstEnergy considerable flexibility to meet the performance standards for I/E reduction.

Comment 35: **There is a general problem with all NPDES permits issued in Maumee Bay and Western Lake Erie. The modeling for the allowable pollutants is set for all of Lake Erie whose average depth is 62 feet. Pollutants discharging into an average Maumee Bay depth of 5 feet and a western Lake Erie depth of 24 feet have greater impacts on water quality than pollutants discharged into 62**

feet of water. Ohio EPA is required under the Clean Water Act to set limits that are protective of water and habitat. The standards used by Ohio EPA for the NPDES permits issued in Maumee Bay and Western Lake Erie, including the Bayshore facility, fail to meet these requirements. Additionally, U.S. EPA ruled that all of Maumee Bay and western Lake Erie is classified as nearshore, having exceptional warm water habitat. For this reason also, Ohio EPA should reevaluate the NPDES discharge limits and determine the appropriate water quality-based effluent limits.

Response 35: The shallowness and often slow circulation of the Maumee Bay and other areas of Lake Erie may suggest that some alternative modeling approach is more appropriate. Although Ohio EPA has given thought to the development of an alternative model for the Maumee Bay, this effort would be difficult and require considerable resources which are not currently available. However, we will continue to explore possibilities for pursuing alternate approaches.

Comment 36: In the factsheet public noticed with the draft NPDES permit, Figure 1 showing the location of the Bayshore facility should be updated to illustrate the current configuration of Confined Disposal Facility Three (CDF).

Response 36: We acknowledge that the depiction of the CDF in Figure 1 of the fact sheet is out of date.

Comment 37: The limited operation of the screens in the intake structure should be investigated and corrected to 24-hour use. (The 2009 report by consultant TetraTech shows one screen is used 15 minutes in a 24-hour period, and another for 30 minutes in a 12-hour period). Why is the Bayshore facility allowed to idle some screens much of the time?

Response 37: Proper operation of the screens within the intake structure is important, and will be a requirement in any overall plan to reduce I/E.

Comment 38: Ohio EPA should require the Army Corps of Engineers to cut a channel through the CDF to improve circulation on the shores of Maumee Bay. Ohio EPA has a duty to look at the entire circulation of the waters along the Bayshore shoreline and the CDF.

Response 38: Ohio EPA does not have the authority to require the U.S. Army Corps of Engineers to dig a channel through the CDF. However, we agree that improved circulation south and east of the CDF would likely mitigate some of the water quality issues currently existing in this area. We also

support any efforts which would analyze the existing circulation patterns in Maumee Bay, but Ohio EPA does have the resources to perform such a study.

Comment 39: Ohio EPA should require Bayshore to analyze and quantify all of its flyash for arsenic, mercury and other pollutants in the CDF and in the landfill.

Response 39: The fly ash from generating unit #1 is considered a solid waste since the fuel is Petcoke, and is hauled off-site for disposal in a licensed solid waste landfill. Generating units 2, 3, and 4 burn only coal, resulting in a fly ash which is not classified as a solid waste and is disposed in an area within the Confined Disposal Facility No. Three (CDF). Storm water runoff from the fly ash disposal area on the CDF is collected in a series of ponds and the resulting wastewater is then pumped to the bottom ash pond. The NPDES permit has been revised to require monitoring of arsenic, selenium, boron, copper, and mercury for any discharges of runoff pumped from these ponds into the bottom ash pond. In addition, the plan of study for the mercury variance has been revised to require characterization of the mercury in this wastewater and minimize or eliminate this potential source of mercury.

Regarding design and operation of the landfill and CDF, please be advised that U.S. EPA is actively pursuing development of new federal regulations for disposal of Coal Combustion Residuals (CCRs). CCRs include both bottom ash and fly ash. (See <http://www.epa.gov/wastes/nonhaz/industrial/special/fossil/coalashletter.htm> .) These regulations, if adopted, would apply to both the CDF and landfill at Bayshore.

Comment 40: The discharge washed from the traveling screens into the plant's discharge canal provides forage for all the lake fish in the canal, resulting in some of the best year-round bank fishing in the area.

Mother Nature is a major player in the life of a walleye. Northeast winds and storms greatly impact the survival of walleye eggs. If the walleye spawn in the river is poor, there is a good possibility that the reef complex spawn which is a few weeks later due to water temperature differences, will be more productive. To place 100% of the blame on the Bayshore facility for decreases in fish populations is inconceivable. It just isn't so because there are other contributing factors.

Response 40: We have no evidence to support that this location: a) represents the best bank fishing spot relative to other localities because of the forage;

and b) provides significantly more forage than other areas due to the Bayshore discharge. It could be that this is a good fishing spot simply because it is accessible to the public and open year-round due to the heated water, which could also be attracting the types of fish species that are desired.

The discharge does not create forage, but potentially re-directs it from the Maumee River and possibly concentrates it into a smaller area. As a result, operation of the Bayshore intake structure may detract from fish benefits outside of the thermal plume, which could be ecologically better for some predators depending on their thermal preferences.

As stated in the comment, nature (i.e., winds, rain, temperature, etc.) affects the survivability of fish eggs and larva, including walleyes. We acknowledge that there are many factors affecting the populations of various fish species in the Maumee Bay and western Lake Erie basin. Finally, Ohio EPA appreciates the interest in preserving what is characterized as a good fishing location; however, scientific evidence clearly indicates large numbers of fish are being killed at the Bayshore facility. Furthermore, the Clean Water Act specifically requires cooling water intake structures to employ best technology available to minimize adverse environmental impacts (i.e., fish impingement and entrainment), and it is Ohio EPA's responsibility to issue a permit that addresses these issues. (See also response #6.)

Comment 41: If Ohio EPA continues to process the draft permit, the Agency must revise the terms and conditions of the draft permit substantially, and the revised draft must be re-noticed and the public must have a full and fair opportunity to comment and request a hearing on the revised draft.

Response 41: See response #30.

Comment 42: A continuous monitoring device for temperature of the effluent from Outfall 001 is considered state of the art and should be provided instead of the once per day monitoring frequency provided in the draft permit at Outfall 001.

Response 42: The facility currently measures and records temperature at outfall 001 every half hour. The maximum temperature recorded for the day is reported to Ohio EPA. Since the data is currently available to establish a detailed temperature profile for outfall 001 based upon existing monitoring procedures, Ohio EPA does not believe it is necessary to revise the sampling type for this parameter.

Comment 43: There is no legal or factual basis for concluding that the technology-based effluent limit (TBEL) in the Draft Permit for total residual chlorine (TRC) at Outfall 001 will adequately protect water quality standards. Ohio EPA must set a WQBEL for TRC at Outfall 001.

Response 43: Water quality-based effluent limits for chlorine (i.e., outside mixing zone water quality standards of 0.011 mg/l for average criteria, 0.019 mg/l for acute criteria, and an inside mixing zone maximum criterion of 0.038 mg/l) are based on frequent or continuous exposures to chlorine. Using the water quality criteria development rules in OAC 3745-1-35 and -36, Ohio EPA has calculated chlorine criteria for short-term exposures (less than two hours). Ohio EPA has determined that chlorine concentrations may be as high as 0.2 mg/l without causing rapid demise in these shorter exposure times. Ohio EPA has also required a limit on chlorine discharge duration to make sure that chlorine discharges do not exceed two hours/day.

Comment 44: As there is no lawful justification for the three-year exemption from coal pile runoff effluent limitations in Part V.A of the permit, Ohio EPA should remove the unlawful language from the draft permit, and stop including this unlawful language in future draft and final NPDES permits for other facilities.

Response 44: We have removed paragraph A. from Part V. of the permit, and it will not be included in any other NPDES permit public noticed or issued in the future.

Comment 45: The final effluent limitations and monitoring requirements in the draft permit for Outfalls 001, 002, and 003 are objectionable because the draft permit attempts to exclude FirstEnergy from monitoring requirements on Saturdays, Sundays and Holidays. There is no basis in law for claiming that weekends and holidays should be exempted from monitoring requirements. This is especially true with respect to effluent limitations such as pH and temperature, which should be subject to automatic continuous monitoring.

Response 45: We have removed this exemption from the permit.

Comments from FirstEnergy

Comment 46: We request clarification on the applicability of the 12 ng/l general variance average yearly requirement, and the front part of the draft

permit that requires a 11 ng/l monthly average. Is enforcement based on the 11 ng/l requirement, or is it based on meeting 12 ng/l with the recognition that if the yearly average is above 12 ng/l, then further requirements are applicable as given on page 16, item F.2. of the permit?

Response 46: Enforcement would be based upon compliance with the monthly average limit of 11 ng/l. Compliance with an annual average limit of 12 ng/l is required in order to renew the variance and to maintain a renewed variance.

Comment 47: We request that this provision requiring a plan for replacing traveling screens be removed from the schedule of compliance. It is not appropriate at this time. As worded in the draft schedule of compliance, this requires a replacement of all of the screens prior to an evaluation of the pilot louver system, or before even knowing the requirements of the re-proposed draft 316b rule that is expected in the summer of 2010. If the Hydrolox screen proves to be effective, then future screen replacements could be completed with the Hydrolox design or equivalent.

Response 47: We have removed this provision.

Comment 48: The Schedule of Compliance in the draft permit requires a description of survival rates. Survival rates of some fish species have already been evaluated. We can provide this information and request that any survival studies be based on two of the most common species (i.e., emerald shiner and white perch).

Response 48: The revised Schedule of Compliance requires FirstEnergy to evaluate the impact to impinged fish that are washed from the traveling screens, dumped into the concrete channel, diverted through a bypass channel, etc., and discharged into the cooling water discharge canal. The existing fish-return system poses potential stresses to fish due to: the high-pressure spray, the concrete channel with several sharp turns, the grate at the end of the return channel in front of the traveling screens, a drop to the cooling water canal and the higher temperatures of the cooling water discharge. The final permit requires walleye, yellow perch, white bass, emerald shiner and freshwater drum to be evaluated for survival. (See response #54.)

Comment 49: We request that the first paragraph of the Schedule of Compliance in the draft permit be worded as follows: "The permittee shall undertake actions and measures described in the paragraphs below, to reduce fish impingement and entrainment (I&E) due to the

operation of the cooling water intake structure (CWIS) at the Bay Shore Station. Actions and measures to reduce I&E shall be implemented to meet target reductions as defined below in Item A.1., in accordance with the schedule in Item A.2.” The words "all necessary," "including those" and "acceptable levels" are requested to be removed since they are an overly broad requirement. Removal of these phrases is consistent with the wording of the opening sentence in A.2.

Response 49: The compliance schedule has been revised, and the phrase “acceptable levels” has been removed.

Comment 50: **Collecting a sample of bottom ash sluice water to the ash pond at the influent monitoring station 601, and performing an ultra-low mercury analysis within this type of matrix results in data that is likely in error. The ultra-low method was not intended for this type of matrix and is subject to interferences from other solids contained in the sample.**

Response 50: We believe that problems associated with matrix interferences are generally not serious for waste streams similar to those at the Bayshore facility, and in any case, methods can be used to minimize possible analytical problems. We can provide additional information regarding this issue if requested.

Comment 51: **We request that the pH measuring frequency for Outfall 003 remain at 1/day. A requirement for continuous measurement frequency with a grab sample is not possible.**

Response 51: We have changed the measuring frequency from “Continuous” to “1/day” for this parameter. In addition, we have changed the sampling type to “Multiple Grab” which is more appropriate with the use of reporting codes 61941 (pH, Maximum) and 61942 (pH, Minimum).

Comment 52: **We do not have reason to believe that we add copper in any statistically measurable quantity to the once-through cooling water utilized at the plant. The requirement from the factsheet for the copper monitoring at Outfall 001 appears to be based on PEQ because of limited data. Both the intake and discharge copper results are below any applicable water quality criteria. The discharge result of 4 ug/l (from the NPDES application data) is below the background that is provided in the fact sheets (i.e., 5 ug/l). As such, we request that the copper monitoring requirement be removed.**

Response 52: Following the reasonable potential procedures in the OAC, copper was placed into risk assessment group 4. Monitoring is required for parameters included in this category. Upon further consideration, we have determined that the monitoring frequency can be reduced, and it has been revised from once per week to once per month in the final permit.

Comment 53: A pilot field study of the fine mesh screen and louver system is underway for the remainder of 2010. This technology scored the highest in a screening analysis of potential I&E reduction options completed by our consultant in 2007. The pilot study will demonstrate the expected reduction in I&E at full-scale deployment, and should also provide insights into ways to improve the system as well as identify potential problems that warrant further design analysis.

Response 53: We acknowledge that the pilot study is underway.

Comment 54: It has been assumed and stated by the public and OEPA that the fish impingement mortality rate is 100 percent. However, studies conducted in 2005 and 2006 at Bayshore indicate that survival from the conventional screens varied with species and time of year, but approach 40 percent for some species. A return system for impinged fish presently exists, which returns fish collected in the screenhouse to the Maumee Bay and Lake Erie via a screen wash system and the discharge channel. A more fish-friendly screen has been installed in one of the nine bay sections of the existing screenhouse. This fish-friendly screen will be evaluated through 2010 and it is anticipated that survivability will be even higher for this screen.

Response 54: In 2008 and 2009, the consultant, TetraTech, reviewed the methodology used for the survival studies referenced above, and included the following statements in their 2009 report:

“Stresses during the collection process, such as hand-picking fish from buckets, might unduly stress fish and artificially reduce survival rates. More problematic, however, is the impingement sampling location near the traveling screens themselves. Samples collected at this location do not account for the potentially negative effects that impinged fish might also suffer during transit through the debris sluiceway or temperature shock encountered when released into the thermal plume. This plume extends several thousand feet east of the intake, and may make

fish more susceptible to predation or restrict a fish's ability to recover from other stresses.”

This assessment suggests that the survival rates developed in these studies conducted in 2005 and 2006 may be invalid, and do not account for all the potential impacts to the fish resulting from the current fish return system. Also, traveling screens which are more fish-friendly are important, however, the concrete sluiceway, the sharp turns in the return system, and the temperature gradient between the intake channel and discharge canal must all be addressed in order to maximize survivability of impinged fish.

Comment 55: The 316(b) program has a long history, and evaluations for 316(b) that were performed by nearly all plants in the 1980s considered Adverse Environmental Impacts (AEI) to the fish population in the demonstration studies. At that time it was clearly demonstrated that an AEI should not occur with the existing system in place at the Bayshore Plant. A robust fishery exists in western Lake Erie so the AEI concept has proven to have been an accurate methodology.

Response 55: Ohio EPA did evaluate power plants in Ohio during the 1970s and 1980s to determine compliance with Sections 316(a) and 316(b) of the Clean Water Act. However, Ohio EPA has no records showing that the cooling water intake structure at the Bayshore facility minimizes adverse environmental impacts. The Clean Water Act requires that, "...cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." Case law in *Riverkeeper, Inc. et al. v U.S. EPA* (2nd Circuit Court, 2004) and *Riverkeeper, Inc. et al. v U.S. EPA* (2nd Circuit Court, 2007), and the final rule in the December 18, 2001, Federal Register addressing regulations for cooling water intake structures (CWIS) for new facilities define the adverse environmental impact that must be minimized under Section 316(b) of the Clean Water Act as the number of aquatic organisms entrained and impinged by cooling water intake structures. In effect, facilities must satisfy the requirements of the Clean Water Act by reducing impingement and entrainment of organisms, regardless of the population impacts to fisheries which may or may not result from the operation of the CWIS.

Finally, you have stated that, "A robust fishery exists in western Lake Erie." One definition of robust is, "in vigorous health," however, Lake Erie fisheries are not healthy in the western basin for either walleye or yellow perch, and the trends have generally been downward during the past decade. The walleye population is classified as being in a rehabilitative state and approaching a crisis state in 2011 by the Lake

Erie Commission. In short, the fishery is not “robust” under any definition of that word. Moreover, the ecological condition of Lake Erie has changed substantially since the 1980s, which renders any conclusions from the previous assessments of adverse environmental impact irrelevant, misleading, or at best, questionable.

Comment 56: It was noted that some believe the impinged fish are collected and disposed of with the fly ash. This is not the case. In those rare instances when a huge gizzard shad die-off naturally occurs, the shad are removed and disposed of in an approved landfill. During normal operations when some fish are impinged, they are washed from the screen and are returned to the lake via the return system.

Response 56: Thank you for providing this clarification.

End of Comments