

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In The Matter Of:)	
)	
EXELON GENERATION LLC)	
Petitioner,)	
v.)	PCB No. 2014-123
)	(Thermal Demonstration – Water)
ILLINOIS ENVIRONMENTAL)	
PROTECTION AGENCY,)	
)	
Respondent.)	

NOTICE OF FILING

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PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the ILLINOIS EPA'S RESPONSE TO BOARD QUESTIONS, a copy of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

By: Stephanie Flowers
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

EXELON GENERATION LLC (QUAD)	
CITIES NUCLEAR GENERATING)	
STATION),)	
)	
Petitioner,)	
)	
v.)	PCB 14-123
)	(Thermal Demonstration)
ILLINOIS ENVIRONMENTAL)	
PROTECTION AGENCY,)	
)	
Respondent.)	

ILLINOIS EPA'S RESPONSE TO BOARD QUESTIONS

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, (Illinois EPA or Agency) by and through its counsel, and hereby submits its response to Board questions as directed by the Hearing Officer Order dated June 25, 2014.

Questions for Illinois Environmental Protection Agency

1. Has the Illinois Environmental Protection Agency (Illinois EPA) consulted with the United States Environmental Protection Agency (USEPA) regarding Exelon's demonstration under Section 316(a) of the Clean Water Act (CWA) submitted to the Board in this proceeding? Has Illinois EPA consulted with USEPA regarding the specific relief requested by Exelon in its petition? If so, describe, and provide copies of, any response provided by USEPA.

AGENCY RESPONSE: The Agency has consulted with USEPA regarding Exelon's demonstration under 316(a). However, the Agency has not consulted with USEPA regarding the specific relief requested by Exelon in its petition. As the 316(a) relief is not reviewed as a water quality standard change, it does not require USEPA approval. USEPA is interested in ensuring that a 316(a) relief granted in Illinois is consistent with the federal regulations. As the Board is aware, USEPA has the right to review the

NPDES permit when the NPDES permit is modified to include the 316(a) relief that has been granted.

2. Illinois EPA's recommendation states that Illinois EPA together with Illinois Department of Natural Resources (Illinois DNR), Iowa Department of Natural Resources (Iowa DNR), United States Fish and Wildlife Service (USFWS), USEPA Region 7, and USEPA Region 5 "participated in developing the plan of study." Rec. at 6. In addition, USEPA's "Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT)," May 1, 1977 (316(a) Manual) provides that the NPDES permitting authority:

checks with the Regional Director of the [U.S. Fish and Wildlife Service] and representatives of the [National Marine Fisheries Service] and States to make sure the study plan includes appropriate consideration of threatened or endangered species as well as other fish and wildlife resources. 316(a) Manual at 15.

State whether Illinois EPA consulted with the Illinois DNR and Iowa DNR on the inclusion of state-listed endangered or threatened species in the study plan for Exelon's CWA Section 316(a) demonstration? If so, what did each department advise with respect to state-listed species?

AGENCY RESPONSE: Illinois DNR and Iowa DNR were consulted and participated in the original study plans for the 316(a) Demonstration. Illinois DNR and Iowa DNR were also consulted and participated in the development of the Habitat Conservation Plan (HCP) and Incidental Take Permit issued by USFWS. The consensus was that the threatened or endangered species that needed to be addressed in connection with Exelon's proposed alternative thermal limits were mussel species, particularly the federally-listed Higgins Eye mussel and the candidate species Sheepnose mussel.

3. Illinois DNR rules on endangered species provide:

As authorized by Section 11(a) of the Illinois Endangered Species Protection Act [520 ILCS 10/11] and by Section 17 of the Illinois Natural Areas Preservation Act [525 ILCS 30/17], state and local units of government shall evaluate, through a consultation process

with the Department, whether actions authorized, funded, or carried out by them, as defined in Section 1075.30, are likely to jeopardize the continued existence or recovery of Illinois listed endangered or threatened species or are likely to result in the destruction or adverse modification of the essential habitat of such species or are likely to result in the adverse modification of a Natural Area. 17 Ill. Adm. Code 1075.40.

In addition, the list of “Actions Requiring Review for Consultation” includes “a discharge of pollutants into the air, water, or on the land.” 35 Ill. Adm. Code 1075.30(a)(5). Has Illinois EPA consulted with the Illinois DNR with respect to Exelon’s requested alternative thermal effluent limitations? If so, what did Illinois DNR advise?

AGENCY RESPONSE: The Agency submitted an EcoCAT consultation. It indicated that the following protected resources may be in the vicinity of the project location: Mississippi River – Cordova INAI Site, Black Sandshell (*Ligumia recta*), Butterfly (*Ellipsaria lineolata*), Higgins Eye (*Lampsilis higginsii*), and Longnose Sucker (*Catostomus catostomus*). IDNR is reviewing the submitted information.

4. Has Illinois EPA consulted with the Iowa DNR with respect to Exelon’s requested alternative thermal effluent limitations? If so, what did Iowa DNR advise?

AGENCY RESPONSE: The Agency submitted a request for Environmental Review for Natural Resources to Iowa DNR. Iowa DNR is reviewing the submitted information.

5. As noted in Illinois EPA’s recommendation, Exelon reports that long-term electrofishing fish monitoring shows “decreases in the numbers of white crappie, black crappie, and sauger.” Pet. Exh. 1 App. C at C-17. Exelon states in response that it will further study these populations. Explain whether Exelon’s requested alternative thermal effluent limitations will assure the protection of the populations of white crappie, black crappie, and sauger in Pool 14 in the absence of, or prior to, further studying these populations.

AGENCY RESPONSE: Exelon has explained that the decrease that has been seen in the habitat changes such as backwater siltation and the appearance of beds of rooted aquatic

plants that was coincident with a noticeable increase in water clarity. The Agency does not disagree with their assertion, but would like Exelon to confirm that the alternative thermal requirements assure the protection and propagation of a balance, indigenous population of shellfish, fish, and wildlife in and on the Mississippi River. The Agency would like Exelon to further study these populations and demonstrate that their heated effluent is not affecting these populations.

6. Comment on requiring the following condition of Exelon:

Exelon will conduct a study of white crappie, black crappie, and sauger populations in Pool 14 of the Mississippi River. Exelon will conduct this study during the term of the first NPDES permit containing the alternative thermal effluent limitations ordered by the Board. The results of this study will be made available to Illinois EPA and Illinois DNR when the Quad Cities Nuclear Generating Station applies for renewal of its NPDES permit.

AGENCY RESPONSE: The Agency believes that this language captures the intent of the Agency's request for white crappie, black crappie, and sauger populations to be studied.

7. Table C-1 (Pet. Exh. 1 App. C at C-31) shows that a zone of passage only would be less than 75% (corresponding to mixing zone greater than 25%) when flow in Pool 14 is below 16,400 cubic feet per second and that Exelon's proposed zone of passage of 66% would not occur until flow drops to 13,200 cubic feet per second. Comment on the reliability of the data presented in this table.

AGENCY RESPONSE: This data is taken from "Numerical Model of the Diffuser Pipe System at Quad Cities Nuclear Generating Station" by Subhash C. Jain et al. from IIHR – Hydroscience and Engineering, College of Engineering, The University of Iowa, April 2002. They used the hydrothermal simulation engine, U²-THERM, which is a special

engine for simulating three-dimensional (3D) coupled hydrodynamic and heat transfer flows with buoyancy effect. It is part of a comprehensive simulation system, U²RANS, developed at IIHR-Hydroscience and Engineering, the University of Iowa. As with any model, there are assumptions and boundary conditions, however, the Agency believes that the data from the model are reliable. The assumptions of this model are that the facility is operating at full thermal load, the upstream water temperature is 82 °F, and the effluent temperature was 28 °F above the intake temperature.

8. Describe the availability of river flow data for Pool 14 and any requirements for Exelon to collect river flow data. Comment on whether Exelon is, or should be, required in the NPDES permit for the Quad Cities Station to collect river flow data.

AGENCY RESPONSE: Special Condition 7 of the NPDES permit requires a weekly determination of the river flow rate (daily when the river flows fall below 23,000 cfs). According to the facility; the station uses USACE L&D 13 outflow for determination of permit compliance (L&D 13 is located approximately 16 miles upstream of the station). There is negligible flow input from other tributaries between L&D 13 and the stations intake, except during periods of heavy rains and flooding, at which time low flows in Pool 14 are not a concern. In the event L&D 13 flow measurements are not available, the station may use either USACE L&D 14 outflow (located approximately 13 miles downstream of station) or USGS site at Camanche (located approximately 5.3 miles upstream from station) for flow measurements. Flow measurements are recorded on USACE and USGS sites a minimum of every 2 hours.

9. Comment on the following alternative thermal effluent limitation:

The mixing zone for the Quad Cities Nuclear Generating Station shall allow for a zone of passage that includes at least 75% of the cross sectional area and volume of flow of the Mississippi River when the river flow is 16,400 cubic feet per second or more and no less than 66% when river flow is less than 16,400 cubic feet per second.

AGENCY RESPONSE: The Agency will be supportive of the Board's inclusion of the alternative thermal effluent limitation in the NPDES permit indicating that Quad Cities Station needs to maintain a zone of passage of at least 75% of the cross sectional area and volume of flow of the flow of the Mississippi River when the river flow is 16,400 cubic feet per second or more and no less than 66% when river flow is less than 16,400 cubic feet per second.

10. Comment on the following alternative thermal effluent limitation:

The mixing zone for the Quad Cities Nuclear Generating Station shall allow for a zone of passage that includes at least 66% of the cross sectional area and volume of flow of the Mississippi River when the river flow is 13,200 cubic feet per second or less.

AGENCY RESPONSE: The Agency does not believe that the proposed language gives the necessary relief. Based on the numerical model, relief from the zone of passage is necessary to flows below 16,400 cfs when the facility is operating at full thermal load. The Agency would find the following language acceptable: "The mixing zone for the Quad Cities Nuclear Generating Station shall allow for a zone of passage that includes at least 66% of the cross sectional area and volume of flow of the Mississippi River when the river flow is 16,400 cubic feet per second or less."

11. Comment on the following alternative thermal effluent limitation:

The mixing zone for the Quad Cities Nuclear Generating Station shall allow for a zone of passage that includes at least 66% of the cross sectional area and volume of flow of the Mississippi River when the river flow is 13,200 cubic feet per second or less. The mixing zone shall allow for a zone of passage that includes at least 75% of the cross sectional area and volume of flow of the Mississippi River when the river flow is 16,400 cubic feet per second or more. For flows between 13,200 cubic feet per second and 16,400 cubic feet per second, the mixing will be as follows:

<u>Flow (cfs)</u>	<u>Zone of Passage</u>
13500	67%
13800	69%
14000	70%
14500	71%
15000	72%
15500	73%
16000	74%

AGENCY RESPONSE: This language assumes that the facility is operating at full thermal load. It may be more accurate to say that at a minimum, the zone of passage is at least equal to the amounts in the following table. If the Quad Cities facility was not operating at full thermal load, the zone of passage would be greater than indicated. The Agency suggests the following change: "For flows between 13,200 cubic feet per second and 16,400 cubic feet per second, the ~~mixing will~~ minimum zone of passage shall be as follows:"

For the Agency, this is the least preferable option because of the complex nature of determining compliance. The language that the Agency feels most comfortable with is located in question 9.

12. Comment on using the zone of passage curve developed during the April 2002 Iowa Institute of Hydraulic Research Report (Jain, et al, 2002) (Pet. Exh. 1 App. C at C-20) to demonstrate compliance with the mixing zone size similar to what appears to be a similar provision in Special Condition 6 of the Quad Cities Station's NPDES permit (Pet. Exh. 1 App. D at D-7).

AGENCY RESPONSE: The Agency believes that the language from question 9 or the modified language of question 11 would be better understood by the public and those reading the permit. The use of the curve would require language that it only applies to receiving stream flows between 13,200 cubic feet per second and 16,400 cubic feet per second. The required language would also need to indicate that the minimum zone of passage must be at least equal to the zone of passage that the flow would dictate based on the zone of passage curve. Finally, it would need to indicate that a zone of passage of 66% must be maintained at flows below 13,200 cubic feet per second and a zone of passage of 75% must be maintained at flow above 16,400 cubic feet per second.

13. Explain how Illinois EPA will require Exelon to demonstrate compliance with the alternative thermal effluent limitations as proposed by Exelon in its petition.

AGENCY RESPONSE: Compliance with the thermal limits and excursion hours would continue to be determined by the Special Condition 7. The facility would continue to be in compliance when the river flow is 21,000 cfs or greater and the river temperature is 5 °F or more lower than the monthly limiting temperatures based on the temperature monitoring curve. When the river flow is less than 21,000 cfs and/or the ambient river temperature is within 5 °F of the monthly limiting temperatures, the permittee shall demonstrate compliance using either: (1) plant load, river flow, ambient river temperature, and the temperature monitoring curve, or (2) field measurement of the river

cross-sectional average temperature taken 500 feet downstream of the diffusers. In the event that compliance monitoring shows that the permittee has exceeded the monthly limiting temperature, the number of hours of such exceedance shall be reported on the permittee's Discharge Monitoring Report. In addition to the reporting requirements of the existing permit, the permittee will be required to indicate which group of excursion hours they used (5 °F or 3 °F).

Also, the permittee will have to demonstrate that they were compliant with the zone of passage, if the flow was below 16,400 cubic feet per second.

14. Exelon requests relief from 35 Ill. Adm. Code 302.102(b)(8) of the Board's mixing zone rules. Explain whether Exelon has demonstrated that its requested 66% zone of passage meets the requirements for granting an adjusted standard under 415 ILCS 5/28.1(c)(1)-(4).

AGENCY RESPONSE: In the Clean Water Act (CWA), Congress carved out a special approach to thermal relief which is to require an owner or operator of a source to demonstrate that the thermal discharge effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the increased heated discharge is made. This approach is different from the requirements for obtaining a relief from other effluent limitations. The Petitioner must meet this burden of proof found at Section 316(a) of the CWA and codified in Illinois at 35 Ill. Adm. Code 106.1160. As long as there is assurance of the protection and propagation of indigenous communities of shellfish, fish, and wildlife, the effluent limitations requested for the thermal discharge could take various forms. Thermal relief might include:

- (1) Relief from a maximum temperature,
- (2) Relief from an existing thermal mixing zone limit,
- (3) Additional excursion hours, or
- (4) Any combination of the above.

For its petition for thermal relief, Exelon has requested an increase in the size of the thermal mixing zone, the excursion hours, and the maximum temperature limits as stated in Special Condition 7 of its NPDES permit which is consistent with a 316(a) relief request. Therefore the Agency believes Exelon should not be required to additionally show that it meets the criteria for an adjusted standard from 35 Ill. Adm. Code 302.102(b)(8). The Agency believes that the economic analysis that is part of an adjusted standard is not appropriate because it is not required as part of the federal 316(a) exemption. The Agency believes, as does USEPA, that thermal relief is not a water quality standard change and that therefore an adjusted standard showing is not needed in the petition for 316(a) thermal relief. If deemed a water quality standard change, any relief granted by the Board would require review and approval by USEPA and, since typically an adjusted standard is intended to be permanent relief, would also need to have a required review every 5 years, the length of the permit cycle.

15. In its petition, Exelon notes that it would need to derate when river flow falls below 13,200 cubic feet per second to maintain the requested zone of passage of at least 66% (Pet. Exh. 1 App. C at C-23) and it would need to derate at certain low flows to maintain compliance with its proposed relief on excursion hours (Pet. Exh. 1 App. B at B-9, B-10). Comment on including a condition in the requested alternative thermal effluent limitation and NPDES permit for the Quad Cities Station requiring the Quad Cities Station to derate under specified conditions to maintain compliance with the requested alternative thermal effluent limitations.

AGENCY RESPONSE: The Agency will be supportive of the Board's inclusion of the alternative thermal effluent limitation in the NPDES permit indicating that Quad Cities Station needs to derate under certain conditions to maintain compliance with the requested alternative thermal effluent limitations.

16. Comment on the following alternative thermal effluent limitation:

When river flow is below 13,200 cubic feet per second, the Quad Cities Nuclear Generating Station will derate as needed to maintain a zone of passage of no less than 66% of the cross sectional area and volume of flow of the Mississippi River.

AGENCY RESPONSE: The Agency will be supportive of the Board's inclusion of the alternative thermal effluent limitation in the NPDES permit indicating that Quad Cities Station needs to derate as needed to maintain a zone of passage of no less than 66% of the cross sectional area and volume of flow of the Mississippi River.

17. Comment on the following alternative thermal effluent limitation:

When river flow is below 15,000 cubic feet per second, the Quad Cities Nuclear Generating Station will derate as needed to comply with the annual allotment of excursion hours.

AGENCY RESPONSE: Excursion hours can be accrued when flows are between 15,000 cfs and 21,000 cfs and when flow is above 21,000 cfs if the ambient river temperatures are within 5°F of the water quality standard. The Agency believes that instead of limiting the need to derate at river flows below 15,000 cfs, a broader statement would be more appropriate: "The Quad Cities Nuclear Generating Station will derate as needed to comply with the annual allotment of excursion hours."

18. Comment on requiring the following condition of Exelon:

Exelon will assess the impact on aquatic life when the Quad Cities Nuclear Generating Station uses more than 219 excursion hours in any twelve-month period. Exelon will conduct this study during the term of the first NPDES permit containing the alternative thermal effluent limitations ordered by the Board. The results of this study will be made available to Illinois EPA and Illinois DNR when the Quad Cities Nuclear Generating Station applies for renewal of its NPDES permit.

AGENCY RESPONSE: The Agency will be supportive of the Board's inclusion of the alternative thermal effluent limitation in the NPDES permit indicating that Quad Cities Station needs to study the impact on aquatic life when Quad Cities Nuclear Generating Station uses more than 219 excursion hours in any twelve-month period. However, the Agency believes that the study should not be limited to the term of the first NPDES permit containing the alternative thermal effluent limitations. The Agency suggests the following change: "Exelon will assess the impact on aquatic life when the Quad Cities Nuclear Generating Station uses more than 219 excursion hours in any twelve-month period. Exelon will conduct this study the first time that more than 219 excursion hours are used in a twelve-month period. ~~during the term of the first NPDES permit containing the alternative thermal effluent limitations ordered by the Board.~~ The results of this study will be made available to Illinois EPA and Illinois DNR when the Quad Cities Nuclear Generating Station applies for renewal of its NPDES permit."

19. Comment as needed on any question posed to Exelon in Attachment 2 to this order.

AGENCY RESPONSE: The Agency has no further comment.

Respectfully Submitted,

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY

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CERTIFICATE OF SERVICE

I, STEPHANIE FLOWERS, an attorney, do certify that I filed electronically with the Office of the Clerk of the Illinois Pollution Control Board the attached ILLINOIS EPA'S RESPONSE TO BOARD QUESTIONS and will cause the same to be served upon the following persons, by placing a true and correct copy in an envelope addressed to:

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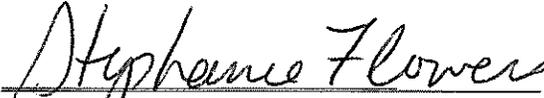
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