BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the Matter Of:	)	
	)	
MARATHON PETROLEUM COMPANY LP,	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB No. 18-49
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

TO: Don Brown
Clerk of the Board
Illinois Pollution Control Board
100 W. Randolph Street, Suite 11-500
Chicago, Illinois 60601
(VIA ELECTRONIC MAIL)

Carol Webb
Hearing Officer
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield, Illinois 62794-9274
(VIA ELECTRONIC MAIL)

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board **MARATHON PETROLEUM COMPANY LP'S RESPONSE IN OPPOSITION TO THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES' MOTION FOR EXTENSION TO FILE,** a copy of which is herewith served upon you.

Respectfully submitted,
MARATHON PETROLEUM COMPANY LP,

Dated: October 12, 2018

By: /s/ Joshua J. Houser
One of Its Attorneys

Katherine D. Hodge
Joshua J. Houser
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CERTIFICATE OF SERVICE

I, Joshua J. Houser, the undersigned, on oath state the following:

That I have served the attached **MARATHON PETROLEUM COMPANY LP'S RESPONSE IN OPPOSITION TO THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES' MOTION FOR EXTENSION TO FILE** via electronic mail upon:

Don Brown
Clerk of the Board
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100 W. Randolph Street, Suite 11-500
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That my email address is Joshua.Houser@heplerbroom.com.

That the number of pages in the email transmission is 29 pages.

That the email transmission took place before 5:00 p.m. on the date of October 12, 2018.

/s/ Joshua J. Houser
Joshua J. Houser

Date: October 12, 2018

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

MARATHON PETROLEUM COMPANY LP'S
RESPONSE IN OPPOSITION TO THE ILLINOIS DEPARTMENT
OF NATURAL RESOURCES' MOTION FOR EXTENSION TO FILE

MARATHON PETROLEUM COMPANY LP ("Marathon"), by and through its attorneys, HEPLERBROOM, LLC, pursuant to 35 Ill. Adm. Code Section 101.500(d), hereby files its Response in Opposition to the Illinois Department of Natural Resources' ("IDNR") Motion for Extension to File the Illinois Department of Natural Resources's Reply to the Illinois Environmental Protection Agency Recommendation ("Motion for Extension") filed on September 28, 2018.

I. BACKGROUND

1. On December 15, 2017, Marathon filed its Petition to Approve Alternative Thermal Effluent Limitations ("Petition") in this proceeding.

2. Pursuant to 35 Ill. Adm. Code Section 106.1145(a), the Illinois Environmental Protection Agency's ("Illinois EPA") 45-day deadline to file its Recommendation to the Board regarding the Petition was by January 29, 2018.

3. As discussed in detail in Marathon's Response to the Recommendation of the Illinois EPA recently filed on September 27, 2018, Illinois EPA requested, and the Board

granted, four extensions of time to file Illinois EPA's Recommendation on Marathon's Petition. *See* Marathon Petroleum Company LP's Response to the Recommendation of the Illinois Environmental Protection Agency, PCB No. 18-49, at 1-4 (Sept. 27, 2018) ("Response to Illinois EPA's Recommendation"). The primary reason for these extensions was to allow for continued discussions and meetings in response to IDNR, a participant in this proceeding, reopening its consultation process due to the occurrences of a state-listed species, Bigeye Chub (*Hybopsis amblops*), reported in Marathon's Bioassessment (Exhibit 7 to the Petition). *See id*.

4. As discussed in detail in Marathon's Response to Illinois EPA's Recommendation, from January through September 2018, Marathon, Illinois EPA, and IDNR held multiple conference calls and meetings regarding the Bigeye Chub and Marathon's requested alternative thermal effluent limitations. *See id*.

5. On August 1, 2018, Illinois EPA informed Marathon and IDNR that Illinois EPA would not be seeking an additional extension of time from the Board to file its Recommendation, and thus, would be filing its Recommendation by the extended deadline of September 10, 2018.

6. The most recent meeting between Marathon, Illinois EPA, and IDNR was scheduled for September 12, 2018. This meeting was scheduled for purposes of continuing, and hopefully concluding, discussions regarding IDNR's recommendations in its letter dated March 29, 2018, and Marathon's Response to same filed on August 15, 2018. *See id*.

7. However, on September 6, 2018, IDNR informed Marathon that IDNR was contracting with the University of Illinois ("University") to conduct bioassays of the Bigeye Chub and that IDNR intended to request an extension of time from the Board for IDNR to file a response to Illinois EPA's Recommendation.

8. On September 10, 2018, Illinois EPA filed its Recommendation to the Board regarding Marathon's Petition, in which Illinois EPA recommends that the Board grant Marathon's Petition. *See* Recommendation of the Illinois Environmental Protection Agency, PCB No. 18-49, at 4 (Sept. 10, 2018) ("Recommendation").

9. On September 11, 2018, one day before the scheduled meeting, IDNR provided Marathon with a copy of the University's draft bioassay proposal entitled "Thermal Tolerance Limits of Bigeye Chub" with a "submission date" of August 6, 2018.

10. On September 12, 2018, Marathon, Illinois EPA, and IDNR met as scheduled and discussed the University's draft proposal; Marathon's comments on same; Marathon's compliance with all applicable state and federal rules, guidance[1], protocols, and analyses for making Clean Water Act Section 316(a) demonstrations in the absence of data for one or more particular species; and the Board's regulations in 35 Ill. Adm. Code Part 106, Subpart K specifically providing for a situation such as the one at issue here where additional data or other information becomes available after the Board grants a petition for alternative thermal effluent limitations, i.e., the new data is considered during the discharger's NPDES permit renewal process. *See* 35 Ill. Adm. Code §§ 106.1170(c), 106.1180.

11. Despite these discussions, on September 28, 2018, IDNR filed its Motion for Extension to file a response to Illinois EPA's Recommendation to the Board to grant Marathon's Petition.

[1] Including the United States Environmental Protection Agency's ("USEPA") Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT) (May 1, 1977).

II. IDNR'S MOTION FOR EXTENSION

12. Marathon objects to IDNR's assertion in its Motion for Extension that, in Illinois EPA's Recommendation, Illinois EPA has "reserved its findings" on IDNR's March 29, 2018 consultation letter and Marathon's Response to same. *See* Motion for Extension, at ¶ 9. In its Recommendation, Illinois EPA merely states that it "is not rendering an opinion" on IDNR's consultation letter or Marathon's Response to same. *See* Recommendation, at 4. Nowhere in its Recommendation does Illinois EPA state that it has reserved any findings, nor do the Board's Subpart K regulations require Illinois EPA to make any such findings in its Recommendation. *See* 35 Ill. Adm. Code § 106.1145(b)(1)-(6). Indeed, Illinois EPA's recommendation after consideration of IDNR's March 29, 2018 consultation letter is an implicit rejection of IDNR's position that Marathon's Petition and supporting information do not satisfy the regulatory standard for granting the requested alternative thermal effluent limitations.

13. In its Motion for Extension, IDNR is requesting more time to respond to Illinois EPA's Recommendation to give IDNR more time to further collaborate with the University on its bioassay proposal, review the University's take permit application, and issue a scientific research permit to the University for the taking of Bigeye Chubs for the proposed study; give IDNR and the University more time to conduct field work and take a sufficient number of Bigeye Chubs to perform the proposed studies (and offset any mortalities resulting from transportation and acclimation); give the University time to acclimate collected specimens, perform the proposed experiments, collect preliminary data, and prepare a preliminary report discussing the completed work and the preliminary data; and give IDNR time to review and analyze the preliminary data, formulate an opinion on the preliminary data, and allow IDNR to

provide that opinion via a response to Illinois EPA's Recommendation. *See* Motion for Extension, at ¶¶ 10-14 and Attachment B.

III. THE UNIVERSITY'S PROPOSAL

14. On September 11, 2018, one day before Marathon's meeting with IDNR and Illinois EPA on September 12, 2018, IDNR provided Marathon with a copy of the University's draft bioassay proposal entitled "Thermal Tolerance Limits of Bigeye Chub" with a "submission date" of August 6, 2018. *See* Email from Virginia Yang, IDNR, to Joshua Houser, HeplerBroom *et al*. with Draft Proposal Attachment (Sept. 11, 2018), attached here as Exhibit 1.

15. Despite the extremely short period of time to review, Marathon reviewed the draft proposal, prepared comments on the proposal, and shared those comments with IDNR during the September 12, 2018 meeting.

16. During the meeting, IDNR indicated that the proposal was still a draft; that IDNR and the University were still collaborating on reviewing and revising the proposal; that IDNR hoped to have an updated draft proposal in a week or two; that IDNR asked the University to begin the application process for a research take permit; that the University's take permit application would require including a final version of the study proposal, which was not yet available; that IDNR had not yet issued a take permit to the University for the taking of Bigeye Chubs; that IDNR still had to complete its third-party contracting and contractual review process with the University; that IDNR and the University hoped to begin the study in the next month or so (noting that there are seasonal limits on when Bigeye Chub may be found, implying that beginning too late would be an issue); that IDNR hoped to receive preliminary, non-peer reviewed results and an executive summary from the University in late November; and that IDNR would then review and rely upon those preliminary, non-peer-reviewed results to

formulate an opinion on Marathon's Petition and Illinois EPA's Recommendation and submit that opinion in this proceeding via a Response to Illinois EPA's Recommendation.

17. During the September 12, 2018 meeting, IDNR agreed to provide a copy of a revised draft study proposal to Marathon once available from the University. As of the date of this filing, IDNR has not provided Marathon with a revised draft of the study proposal.

18. In IDNR's Motion for Extension, IDNR attached a copy of the study proposal as Attachment B. Just like the copy of the draft proposal provided to Marathon on September 11, 2018, the copy of the proposal in Attachment B has a "submission date" of August 6, 2018. In IDNR's Motion for Extension, IDNR implies that the proposal attached as Attachment B is the same proposal that IDNR discussed with Marathon during the September 12, 2018 meeting. *See* Motion for Extension, at ¶ 10. However, upon review, IDNR and/or the University has/have made numerous changes to the proposal, some changes being significant substantive changes, compared to the draft proposal provided to Marathon on September 11, 2018.

19. These changes include the following:

- pushing back the project start date by three weeks;
- adding an additional fish species (creek chubs, *Semotilus atromaculatus*) for collection, laboratory testing, and data reporting;
- removal of discussion about a significant portion of the experimental protocol being dependent on whether or not fish will feed in the laboratory after collection, that wild fish brought into captivity are sometimes unwilling or unable to feed, and that the inability or unwillingness to feed can compromise the fishes' condition during holding and cause experimentation to occur sooner than what is ideal to ensure the fish are robust enough during experiments, which in turn reduces or eliminates the opportunity for multiple acclimation temperatures and a wider range of temperatures;
- reducing the number of proposed experiments from three to one (eliminated the proposed experiments for lethal thermal tolerance under dynamic conditions and for swimming performance following thermal stress), noting that the researchers are still working on trying to obtain permission from the University's Institutional Animal Care and Use Committee to conduct studies that include lethal endpoints (despite this

draft proposal apparently being first submitted to IDNR approximately two months ago);

- revising the endpoint(s) that would be measured;
- revising the rate of heating of chubs during experimentation;
- adding additional information regarding proposed acclimation temperatures, acclimation protocol, and ramping thermal trial protocol;
- revising the protocol for measuring dissolved oxygen levels during experimentation;
- adding discussion regarding the University's intention to obtain a take permit from IDNR; and
- adding discussion regarding the need for the researchers to obtain prior approval of all studies from the University's Institutional Animal Care and Use Committee in advance of any animal handling.

20. Despite IDNR's commitment during the September 12, 2018 meeting to provide Marathon with a copy of a revised draft proposal once available, IDNR has not provided Marathon with any such revised draft proposal. Thus, at the time of this filing, Marathon presumes that the proposal attached to IDNR's Motion for Extension is still a working draft. Also, despite significant revisions in the version of the proposal attached to IDNR's Motion for Extension, IDNR and the University are still presenting this version of the draft proposal with the same "submission date" of August 6, 2018 used in the draft proposal provided to Marathon on September 11, 2018. If the proposal is still a draft, then IDNR and the University are clearly still working on finalizing the study proposal and obtaining the necessary approvals and permits, which will result in further delay in implementing the field work, experimentation, data collection, and reporting.

21. In addition to the concern that IDNR and the University have still not finalized the proposal, there are numerous factors involved with the study proposal itself that could result in even further delays. First, it remains uncertain whether the University has even applied for a

take permit from IDNR yet. It does not seem as though the IDNR has issued a take permit to the University yet. *See* Attachment B (University's Proposal) to Motion for Extension, at 7 ("Appropriate Endangered Species Permits will be obtained from the [IDNR] prior to commencing any work . . . ." (emphasis added)).

22. Similarly, despite IDNR and the University researchers having been working on the proposal for two or more months now, the researchers are apparently still working on obtaining the necessary approvals from the University. *See id*. at 5 ("Work is currently ongoing to obtain permission from the University of Illinois Institutional Animal Care and Use Committee (IACUC) to conduct studies that include lethal endpoints." (emphasis added)); *id*. at 7 ("[A]ll studies will receive prior approval from the University of Illinois Institutional Animal Care and Use Committee (IACUC) in advance of animal handling." (emphasis added)).

23. Even after field work begins, there are concerns with timely collection of the necessary number of Bigeye Chubs. *See id*. at 8 ("Fish collections will occur within the Vermillion River Basin (Wabash River drainage), using DNR staff. It is challenging to identify specific sampling locations at this time as collection of this rare species can be unpredictable." (emphasis added)). Also, during the meeting on September 12, 2018, IDNR acknowledged that there are seasonal limits on when Bigeye Chub may be found.

24. In addition to the collection of Bigeye Chubs, the University is now also proposing to collect Creek Chubs. *See id*. at 3. However, it is not clear from the current version of the proposal whether this will actually occur or whether other species will be collected. *Compare id*. ("Concurrent with work on bigeye chub, the [*sic*] we also plan on collecting creek chubs (*Semotilus atromaculatus*) and conducting identical experiments with creek chubs . . . ." (emphasis added)) *with* ("Concurrent with the collection of bigeye chub, an equal number of

minnows will also be collected (likely creek chub) . . . .” (emphasis added)). Collection of, and experimentation on, an additional species of fish will increase the amount of time required for field work, experimentation, data collection, analyses, and reporting.

25. After collection of fish, there are concerns with the risk and uncertainty of inadvertent mortalities during transportation, holding, and acclimation. This risk and uncertainty doubles with the proposal now including a second species of fish. Additional time for fieldwork and fish collection may be required to compensate for such inadvertent mortalities and obtain the required number of fish.

26. In the version of the proposal attached to IDNR’s Motion for Extension, IDNR and/or the University removed discussion from the previous draft proposal (despite retaining the same “submission date” of August 6, 2018) regarding a significant portion of the experimental protocol being dependent on whether or not fish will feed in the laboratory after collection, that wild fish brought into captivity are sometimes unwilling or unable to feed, and that the inability or unwillingness to feed can compromise the fishes’ condition during holding and cause experimentation to occur sooner than what is ideal to ensure the fish are robust enough during experiments, which in turn reduces or eliminates the opportunity for multiple acclimation temperatures and a wider range of temperatures. Despite the removal of this discussion from the current version of the proposal, these issues remain significant concerns and must not be ignored, especially as they pertain to the timing of completing the experiments.

27. The above concerns regarding unwillingness or inability to feed in the lab are also directly relevant to the timing for establishing appropriate acclimation temperatures. Marathon’s filings in this proceeding have discussed in detail the importance of acclimation temperature. Indeed, even the University acknowledges this importance. *See id*. at 3 (“[T]he upper thermal

limit of ectotherms is heavily influenced by acclimation temperature, with upper limits increasing with higher acclimation temperature . . . .").

28. Also, even after any setbacks from the collected fishes' inability or unwillingness to feed, the acclimation process itself will take over a month to complete. Specifically, the proposal states that "following transfer to the laboratory, chubs would be held at the temperature at which they were collected, and brought to the target acclimation temperatures at a rate of 1º C/day." *See id*. at 4 (emphasis added). At a 1º C/day rate, bringing the fish to the target acclimation temperatures could take days or weeks, depending on how different the collection temperatures are from the target acclimation temperatures. In addition, even after reaching the target acclimation temperatures, "animals would be held for at least 30 days to ensure thermal acclimation . . . ." *See id*. (emphasis added). This holding period of at least 30 days is extremely important, as it would "allow[] data on the influence of acclimation temperature on tolerance to be generated . . . ." *See id*.

IV. THE BOARD SHOULD DENY IDNR'S MOTION FOR EXTENSION AND PROCEED WITH ITS DECISION ON MARATHON'S PETITION

29. As discussed in detail in Marathon's previous filings in this proceeding, in accordance with USEPA's Interagency Guidelines,[2] the only option available to Marathon was a predictive Type II 316(a) demonstration because of the existing impaired status of the aquatic biota in Robinson Creek. *See*, *e.g.*, Marathon Petroleum Company LP's Response to the Illinois Department of Natural Resources' Consultation Letter, Dated March 29, 2018 ("Response to IDNR Letter"), PCB No. 18-49, at 8; *see also* Exhibit 1 to Response to IDNR Letter, MBI Response to March 29th Letter, at 1-9, 15-16. A Type II demonstration utilizes the concept of

[2] USEPA, Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT) (May 1, 1977).

Representative Important Species ("RIS") where thermal tolerance data for a representative portion of the potential aquatic assemblage under unpolluted conditions reflects the response of the entire assemblage, including species that do not have sufficient thermal tolerance data. *See id*. Marathon's consultant, Midwest Biodiversity Institute ("MBI"), concludes, in part, that the reconsideration of Bigeye Chub as a candidate RIS does not alter the original conclusions of Marathon's 316(a) demonstration or the summer average and maximum temperatures derived by the Fish Temperature Modeling System used in MBI's analyses supporting Marathon's 316(a) demonstration. *See id.* While insufficient thermal tolerance data was available to include Bigeye Chub as a final RIS, MBI's analysis of the influence of acclimation temperature on thermal tolerance endpoints is sufficient to estimate the status of Bigeye Chub among the RIS that have sufficient thermal data and the principal conclusion that this species is covered by other RIS. *See id*.

30. Indeed, in its Recommendation, Illinois EPA "agrees [that Marathon] has demonstrated that the proposed alternative thermal limits would not adversely affect the balanced, indigenous population of fish, shellfish, and wildlife currently inhabiting the receiving water" and further concludes that "[t]he analyses and observations in the 316(a) Demonstration support the conclusion that the proposed limits are sufficiently protective of the RIS and the full assemblages by extension. As such, this satisfies the demonstration that the requested alternative thermal effluent limitation under Section 316(a) is justified." Recommendation, at 4-6.

31. Moreover, Marathon is not opposed to IDNR's and the University's efforts to acquire thermal tolerance data for the Bigeye Chub. Rather, Marathon is opposed to further delaying this proceeding to wait on an opinion from IDNR that will be based on only preliminary, non-peer reviewed data generated from a study that has, as discussed above, a

significant level of uncertainty as to the specific study protocols that will be implemented and the timing of completion of the various study phases.

32. Rather than rushing through a study and formulating an official position based on preliminary, non-peer reviewed data, Marathon asserts that the better approach at this time is for the Board to proceed with its decision on Marathon's Petition, acknowledging that, pursuant to the Board's Subpart K regulations, Marathon will be required to review and consider any new, relevant data produced by the University's study at the time of Marathon's NPDES permit renewal. *See* 35 Ill. Adm. Code §§ 106.1170(c), 106.1180.

33. This approach will allow the University to complete its study without time constraints that could negatively impact the quality of the resulting data (e.g., fishes' inability or unwillingness to feed resulting in the need to push forward the beginning time of experimentation, despite an inadequate acclimation period, which will result in less accurate and potentially skewed thermal tolerance data). Accurate, uncompromised data is especially important where it will be the basis for an official government agency opinion.

34. This approach will also allow the University to appropriately vet its study's protocols and data through the peer review process before the study is relied upon by the government and scientific community. IDNR's apparent belief that it is appropriate to rely upon preliminary, non-peer reviewed data from an academic, scientific study when formulating an official government agency opinion and filing such opinions in formal adjudicatory proceedings, especially adjudicatory proceedings in which IDNR is not even an actual party, is flawed and contradicts the scientific approach taken by other government agencies.

35. Indeed, the peer-review process is standard in the academic and scientific community, ensures credibility of reported studies, ensures a review by peers who are not

financing the research (like IDNR is financing the University's study), and is utilized by government agencies when making decisions based on scientific studies. *See, e.g.*, United States Fish and Wildlife Service, Peer Review of Scientific Information, Ensuring the Quality and Credibility of Information, *available at* www.fws.gov/informationquality/peer_review/index.html ("In order to ensure the quality and credibility of the scientific information we use to make decisions, the Fish and Wildlife Service has implemented a formal 'peer review' process for influential scientific documents." (emphasis added)) (last visited Oct. 5, 2018); *see also* National Academies of Sciences, Engineering, and Medicine, Peer Review in the Department of Energy-Office of Science and Technology: Interim Report (1997), Definition of Peer Review, *available at* www.nap.edu/read/5939/chapter/4 ("A peer review is a documented, critical review performed by peers . . . who are independent of the work being reviewed. The peer's independence from the work being reviewed means that the peer, a) was not involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed, and b) to the extent practical, has sufficient freedom from funding considerations to assure the work is impartially reviewed." (emphasis added)) (last visited Oct. 5, 2018).

36. Even the University acknowledges the critical importance of the peer-review process. *See* Attachment B (University's Proposal) to Motion for Extension, at 5-6 ("Efforts would also be made to publish the results in a peer-reviewed journal outlet. . . . Publication in peer-reviewed outlets is critical for obtaining scientific validation of results and ensuring that the study receives rigorous, outside reviews by impartial, qualified scientists . . . ." (emphasis added)).

37. Based on the above, Marathon asserts that it will be inappropriate for IDNR to rely upon preliminary, non-peer reviewed data to formulate its opinion on Marathon's Petition

and Illinois EPA's Recommendation, especially when IDNR will be participating in, technically reviewing, and funding the University's study. Instead, IDNR should allow for the University's study to be appropriately peer-reviewed before IDNR relies upon the scientific information in the study. Based on the version of the University's proposal attached to IDNR's Motion for Extension, manuscript preparation and dissemination for peer-review would not be completed until Summer 2019. *See id*. at 7 (although the proposal indicates Summer "2018," Marathon assumes this should say Summer "2019"). This estimated timeframe could end up occurring even later, depending on how many delays are experienced in the study's phases prior to manuscript dissemination.

38. After the University's study has been appropriately peer-reviewed and IDNR forms its opinion based on same, the Board's Subpart K regulations require that Marathon consider that study during Marathon's NPDES permit renewal process. Specifically, the Board's Subpart K regulations specifically provide for a situation such as this where additional data or other information may become available after the Board's granting of alternative thermal effluent limitations, i.e., the new data is considered during the discharger's NPDES permit renewal process. *See* 35 Ill. Adm. Code §§ 106.1170(c), 106.1180.

39. Thus, if the Board grants Marathon's Petition, and IDNR and the University subsequently complete the proposed study and that study produces data relevant to Marathon's 316(a) demonstration, and Marathon requests that its alternative thermal effluent limitations be continued in its renewed NPDES permit, then Marathon will be required to consider and incorporate, as appropriate, the new Bigeye Chub data as part of its NPDES renewal process. Specifically, Marathon must demonstrate, and Illinois EPA must review and approve, that the nature of Marathon's thermal discharge and its alternative thermal effluent limitations have not

caused appreciable harm to a balanced, indigenous population of shellfish, fish, and wildlife in and on Robinson Creek. *See* 35 Ill. Adm. Code § 106.1180. Any new, relevant Bigeye Chub thermal tolerance data would be included in such a demonstration.

40. Meanwhile, Marathon asserts that, with Illinois EPA's filing of its Recommendation, the Board now has all information in this proceeding's record required to proceed with its decision on Marathon's Petition. Marathon clearly does not dispute the occurrences of Bigeye Chub in Robinson Creek or the minimal data available on the thermal tolerance of Bigeye Chub. Marathon itself reported these Bigeye Chub occurrences in the Petition's Bioassessment. Marathon's Addendum and Response to IDNR's March 29th Letter provide extensive technical analyses on the potential for adverse effects to Bigeye Chub that might be posed by Marathon's requested alternative thermal effluent limitations and conclude that the occurrence of Bigeye Chub in Robinson Creek has no effect on the conclusions of Marathon's 316(a) technical evaluation or on the alternative thermal effluent limitations requested in Marathon's pending Petition, i.e., that Marathon's requested alternative thermal effluent limitations will assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on Robinson Creek. As discussed above, Illinois EPA has concluded that no additional information is needed to support the Petition.

41. As demonstrated in Marathon's Petition, Technical Support Documentation, Addendum, and Response to IDNR's March 29th Letter, Marathon has followed all applicable state and federal rules, guidance[3], protocols, and analyses for making Clean Water Act Section 316(a) demonstrations in the absence of data for one or more particular fish species.

[3] Including USEPA's Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT) (May 1, 1977).

V. CONCLUSION

For the foregoing reasons, Marathon asserts that the Board has all required information in the record to proceed with its decision on Marathon's Petition. Marathon's Petition and supporting information support the conclusion that the requested alternative thermal effluent limitations are sufficiently protective of the RIS and the full assemblages by extension, and Illinois EPA's Recommendation agrees with the same. Although Marathon does not oppose IDNR's and the University's work to acquire data on the thermal tolerance of Bigeye Chub, this proceeding (and in turn, the renewal of Marathon's NPDES permit pending since 2013) should not be further delayed (likely for a year or more) while waiting for IDNR and the University to complete these studies and the appropriate peer review process. Pursuant to the Board's regulations regarding renewals of alternative thermal effluent limitations, any relevant data produced by IDNR's and the University's studies would be properly analyzed and considered during Marathon's NPDES permit renewal process.

In addition, despite Illinois EPA's review of IDNR's consultation recommendations and awareness of IDNR's and the University's proposed Bigeye Chub study, Illinois EPA issued its Recommendation recommending that the Board grant Marathon's Petition. Therefore, Marathon respectfully requests that the Board deny IDNR's Motion for Extension, proceed with its review of Marathon's Petition, and, consistent with Illinois EPA's Recommendation, grant Marathon's Petition for Alternative Thermal Effluent Limitations.

<signature on following page>

Respectfully submitted,

MARATHON PETROLEUM COMPANY LP,

By: /s/ Joshua J. Houser
One of Its Attorneys

Dated: October 12, 2018

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EXHIBIT 1

Katie J. Ginest

From: Yang, Virginia <Virginia.Yang@Illinois.gov>
Sent: Tuesday, September 11, 2018 2:02 PM
To: Joshua J. Houser; Katherine D. Hodge; Terranova, Sara
Cc: Lohrenz, Eric; Snow, Renee
Subject: Marathon 316(a) - UIUC proposal for Bigeye Chub Thermal Stress Study
Attachments: 2018_UIUC_Proposal_Bigeye_Chub_Thermal_Stress.pdf

Importance: High

CAUTION: External E-Mail

Hello Everyone,

For tomorrow's meeting regarding the Marathon 316 (a) Thermal Petition, I've enclosed a copy of the UIUC proposal for the Thermal Tolerance Limit of the Illinois Bigeye Chub, submitted 8/6/18. The project dates are tentative 9/1/18 to 8/31/19. However, preliminary findings may be available by November, 2018 for incorporation into IDNR's Reply to Marathon's 8/14/18 Response to IDNR's Consultation Letter, dated 3/29/18, and to IEPA Recommendation, dated 9/10/18.

If there are comments or questions, we can discuss further at our 1: 30 pm meeting at IDNR/Springfield office (LL).

Thank you,

Virginia I. Yang
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Proposal Entitled

THERMAL TOLERANCE LIMITS OF BIGEYE CHUB

For Submission TO:
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Submitted BY:
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Project Dates: September 1, 2018 – August 31, 2019

Submission Date: August 6, 2018

The bigeye chub (*Hybopsis amblops*) is a species of slender, silvery minnow native to previously glaciated areas within the Lake Erie and Ohio River drainages of the Central Highlands region of eastern North America (Berendzen et al. 2008). This species can typically be found in clear, gravel-bottomed streams with permanent flow and little silt, preferring to reside at the base of riffles or in quiet pools (Pfleiger1975).

Unfortunately, over the past several decades, the bigeye chub has been disappearing throughout its native range. For example, the species is believed to have been extirpated from both Michigan (Michigan Natural Features Inventory 2007), and Virginia (Angermeier 1995), and is currently listed as State Endangered within Illinois (IESPB 2015). The reasons for this decline can likely be attributed to human-mediated factors related to agriculture such as habitat loss, siltation, fertilizers and pesticides (Page and Retzer 2002).

Another human-induced stressor that can lead to mortality in fishes is thermal stressors (i.e., extreme temperatures) - both natural or human-induced. Water temperature is the most important abiotic factor influencing a fish's biology. Body temperature has a major impact on short-term performance (e.g., swimming ability for predator avoidance), and eventually on its survival and fitness. Thermal performance can be described by a curve that rises gradually with temperature from a critical thermal minimum (CT_{min}) to an optimum temperature (T_{opt}), and then drops rapidly to the critical thermal maximum (CT_{max}) (see Figure 1). Previous work has shown that elevated temperature can lead to outcomes such as elevated energy consumption, stress, impaired swimming and ultimately death as animals approach their CT_{max}, and the ability of an organism to remain active under extreme conditions is a significant component of fitness. Therefore, determining the limits to activity is an important first step in understanding the ways that thermal stressors influence survival and fitness, and population viability.

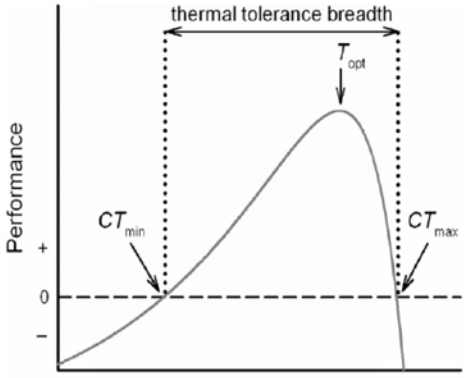

Figure 1. *Thermal performance curve of an animal across a range of temperatures.*

Typically, thermal limits have been assessed using either dynamic or static methods (Lutterschmidt & Hutchison 1997; Beitinger and Lutterschmidt 2011). Briefly, the dynamic (ramping) method involves changing temperature at a constant rate and assessing variables related to the temperature of physiological failure, such as equilibrium loss or the onset of spasms (often referred to as CTL or critical thermal limit); this approach can also continue until mortality occurs in 50 % of test subjects (LD-50). Alternatively, the static method involves holding temperature constant and acutely transferring test organisms into the stressful temperature, with responses related to incapacitation recorded, including the time to onset of spasms or time to equilibrium loss; these protocols can again continue until an LD-50 point is reached. It is also possible to quantify recovery times following the onset of these responses to ascertain the duration of impairment. Of the two techniques, the dynamic method is particularly appealing because it provides a direct estimate of the target variables (e.g., CT_{max}), it provides an indication of the activity range for a population under acute exposure conditions, is considered to be ecologically relevant, and rates of thermal change can be adjusted to render ecologically realistic values (Lutterschmidt & Hutchison 1997; Beitinger and Lutterschmidt 2011).

At present, virtually no information exists on the thermal limits of bigeye chub. Comprehensive literature searches revealed only a single study related to thermal tolerance in bigeye chub (Lutterschmidt & Hutchison 1997), and this study used a single fish to identify 30.1° C and 31.7° C as the temperatures at which animals lost equilibrium and experienced spasms (respectively) during a dynamic thermal challenge following acclimation to 10° C. Unfortunately, it is difficult to broadly apply results from this single study and make recommendations related to thermal limits for bigeye chub as (1) results from this single study might not be representative of all animals across the range of this species, (2) the sample size in this single study was 1 individual, meaning there is no replication on fish, and (3) the upper thermal limit of ectotherms is heavily influenced by acclimation temperature, with upper limits increasing with higher acclimation temperature (e.g., both upper and lower lethal temperatures of fishes increase during the transition from winter to summer – see Figure 2). As such, additional work is needed with bigeye chub to define thermal limits and ecologically relevant endpoints related to thermal stressors, particularly for animals acclimated to different water temperatures.

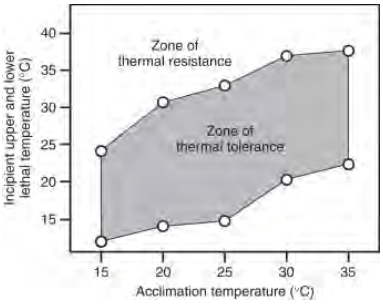

Figure 2. *Upper and lower lethal temperatures following a thermal challenge test for a hypothetical fish acclimated to different temperatures. At higher acclimation temperatures, animals can tolerate elevated temperatures in thermal tests.*

Based on this background, the goal of this proposal is to *define the thermal limits of bigeye chub following thermal challenge assays*. Data generated from this proposal will provide critical information on the thermal limits of a threatened, data-deficient fish species.

Methods

Animal Collection

Bigeye chub for this study will be collected with the assistance of the Illinois Department of Natural Resources (DNR) from the Vermilion River basin (Wabash River drainage) using commonly accepted techniques that have minimal impact on fish (e.g., backpack electroshocking or seine netting). Preliminary discussions have occurred with DNR personnel, and a total collection of 40 individuals for this work should be possible, and permission to harvest this state endangered species should be granted.

Animal holding

Following collection, bigeye will be returned to the Aquatic Research Facility in Urbana, IL. Animals will be held in indoor aquaria that have been outfitted with necessary equipment for fish holding (e.g., ultraviolet water filters, temperature control, etc.). Extreme care will be taken to ensure optimum holding conditions to minimize stress when in tanks.

A great deal of the experimental protocol outlined below depends on whether or not fish will feed in the lab. In some cases, wild fish brought into captivity are unwilling or unable to feed, which can compromise their condition during holding. In contrast, if animals can be coaxed to feed in the lab, holding times can be prolonged, providing opportunity for multiple acclimation temperatures and a wider range of temperatures. The intent is to collect a small subset of animals (n = 2-4) and try

preliminary feeding trials with them using daphnia (or similar zooplankton), invertebrates (earth worms, meal worms, wax worms or similar) and/or or commercially available fish food (flakes and/or pellets) in an effort to induce feeding. Ideally, within a few days, animals would become converted to eating pelleted or flaked fish food. If animals are unable or unwilling to feed in the lab, experiments will need to occur very soon after arrival in the lab to ensure they are robust during experiments.

Experiment 1 – Non-lethal thermal tolerance during a dynamic (ramping) assay (n = 16 bigeye chub)

Thermal tolerance and non-lethal responses of bigeye chub would be generated using a dynamic (ramping) assay. The dynamic assay better replicates the ecological conditions under which thermal stress would be encountered in the wild, and requires a smaller number of fish (better suited for this endangered species) and will provide useful estimates of tolerance to acute, but not chronic, thermal stress.

Briefly, the experiment consist of heating bigeye chub at constant temperature (ΔT) and quantify as the temperature at which locomotory activity becomes disorganized and the animal loses its ability to escape from conditions that will promptly lead to its death (for example, when an animal would become vulnerable to predation). The two endpoints that would be measured are (1) loss of equilibrium, and (2) onset of spasms.

The keys to this test include (1) consistent ΔT during trials, (2) the choice of an obvious, repeatable near-lethal but sublethal endpoint, and (3) ΔT should be fast enough to prevent reacclimation during a trial and slow enough to allow body temperature to track external temperatures without a time lag (usually 0.3–1.0 °C/minute). Two factors will be considered when defining the rate of temperature increase: (1) ecological relevance of expected thermal changes in the wild, and (2) maintaining a heating rate that is sufficiently fast to avoid confounding effects of holding and/or confinement stress.

Ideally, bigeye chub that have been acclimated to multiple temperatures for at least 30 days would be used in this experiment, allowing data on the influence of acclimation temperature on tolerance to be generated (as in Figure 2). However, if animals cannot be coaxed to eat in the lab, extended holding could negatively impact thermal tolerance and thermal trials will occur soon after arrival in the lab to avoid negative impacts of stress or condition on data.

No effort will be made to maintain dissolved oxygen concentration during trials, and it is expected that dissolved oxygen will decline as temperatures increase; the reality is that, in a natural setting, this decline in dissolved oxygen concurrent with increased temperature would be expected, thus coupling reduced oxygen with elevated temperature. At the conclusion of the study, dissolved oxygen will be measured to quantify final concentration.

After animals loose equilibrium, they will immediately be returned to water at their acclimation temperature and their ability to recover will be quantified, defined as returning to an active, upright and informed swimming behavior.

Experiment 2 – Lethal thermal tolerance under dynamic conditions (n = 14 bigeye chub).

Procedures here will be based on protocols outlined in Experiment 1. Briefly, bigeye chug will be heated at constant temperature (identical to the rate used in Experiment 1), and the temperature that results in animal death will be recorded. The study will continue until 50 % of animals in a test have died, at which point the test will cease in an effort to reduce mortality levels.

Experiment 3 – Swimming performance of bigeye chub following thermal stress (n = 10 bigeye chub).

The ability of small fishes to burst swim (i.e., 'sprint') is critical for avoiding predators, and thermal stressors have the potential to impair swimming. For this study, the burst swimming ability of bigeye chub following a thermal stress will be quantified. Briefly, bigeye chub will be transferred to a swim challenge arena (likely a swim tunnel) and given a brief acclimation time. One group of fish will then be forced to burst swim (i.e., sprint) without a thermal challenge, and their swimming ability will be quantified. A second group of fish will be treated in an identical fashion and forced to sprint, but their swim challenge will occur in water that has been rapidly warmed, allowing the quantification of thermal stressors on bursting. The magnitude of the thermal disturbance will be based on ecologically relevant data, as well as data from Experiments 1 and 2.

When taken together, results from these 3 experiments will provide critical data on the thermal tolerance of bigeye chub, as well as the impact of thermal stressors on a number of responses important for survival of this species.

Proposed Budget

Category	Amount
Personnel	$ 7,350
Fringe Benefits	$ 589
Travel	$ 661
Materials & Supplies	$ 1,948
Contractual Services	$ 300
Publication Costs	$ 1,500
Sub-total	$ 12,349
Indirect Costs	$ 5,032
Total Cost	**$ 17,381**

Budget Narrative

- This work would be carried out by a PhD student. Suski currently has a current PhD student starting in Fall 2018 that has agreed to take lead on the field/lab components of this study. The rate for pre-prelim, PhD students holding a 50 % grad research assistantship is $2,450/month; fringe benefits are assessed at the current University of Illinois Rate outlined at https://www.obfs.uillinois.edu/common/pages/DisplayFile.aspx?itemId=922087. Note that tuition remission is **NOT** being charged for this student.

- Travel consists of two categories: (1) mileage to/from collection sites, and (2) hotel for the graduate student to attend the annual meeting of the IL Chapter of the American Fisheries Society (IL AFS) to share research findings with other fisheries professionals in the state.
    - Suski currently has an F150 pickup truck that would be ideal for this project, and it 3 trips to the Vermillion River basin for collections have been budgeted (mileage rate is $0.517/mile).
    - Attending conferences is critical for sharing results from the study, informing managers/biologists of findings and for professional development of students. The IL AFS meeting is a popular event for fisheries professionals in the state, and many individuals that attend this meeting would be interested in the results of this study. Funds for 2 nights of hotel stay ($125/night) have been budgeted.
- Materials and supplies consist of items required to collect fish, hold fish, and generate data for the specific items and their costs are in the following table:

Item	Cost
Heater/chiller	$ 838.99
Immersion heater	$ 305.59
Aerator	$ 256.99
Air stones	$ 37.78
Tubing	$ 50.00
Nets	$ 20.00
Coolers	$ 200.00
Bait aerators × 2	$ 63.00
Fish food	$ 50.00
MS222	$ 125.89
Total	**$1,948.24**

    - Briefly, a heater/chiller is required to ensure stable temperatures during laboratory acclimation; an immersion heater is required for thermal challenges; an aerator/air stones ensures animals have oxygen during holding; coolers are required for transporting animals from the field; MS222 is required for euthanizing animals.
- A total of $300 for contractual services has been budgeted to pay for conference registration for IL AFS for the student
- A total of $1,500 has been requested for publication fees. Publication in peer-reviewed outlets is critical for obtaining scientific validation of results and ensuring that the study receives rigorous, outside reviews by impartial, qualified scientists; it is also needed to ensure the wide distribution of the findings from this study. The target journal for this work is Endangered Species Research (https://www.int-res.com/journals/esr/about-the-journal/), which specializes in publishing studies of endangered life forms (including those of local or regional concern. This outlet would also be sensitive to the limited number of animals that can be used for the study. This journal has an open access format, and page charges for publishing are €1,300, or approximately $1,500 USD.
- Indirect costs have been charged at **40.75 %** as per the FY 2019 State of Illinois Facilities and Administrative Rate Schedule at https://www.obfs.uillinois.edu/common/pages/DisplayFile.aspx?itemId=921222.

Timeline

	Fall 2018	Winter 2018	Spring 2018	Summer 2018
Fish Collection				
Data Generation				
Analyses				
Manuscript preparation & dissemination				

General Compliance

Information from this project will be utilized by the IDNR, United States Geological Survey and other Federal/State agencies to assist with the enhancement and rehabilitation of native fish stocks. Data will help define thermal limits and the impact of thermal stressor son bigeye chub in Illinois.

All planned activities will be in compliance with NEPA, the Endangered Species Act, as well as the U.S. Fish and Wildlife Service protocols for section 7.

All planned activities will also be in compliance with the National Historic Preservation Act and the Council on Historic Preservation Act.

Character and Design

This proposal is substantial in character and design with the needs of protecting and enhancing native fish populations in Illinois. This project will provide, in part, needed information through a thorough and planned approach, using accepted laboratory and statistical approaches, regarding the thermal limits and the impact of thermal stressors on bigeye chub.

Relationship to Other Grants

This proposal is somewhat unique and distinct to other projects that Dr. Suski has ongoing in his research group. Dr. Suski and his research group are currently asking questions related to the impacts of agricultural land use on the abundance and distribution of fishes in the Kaskaskia River Basin (funded by USDA-NIFA), constraints impeding sustainable fisheries policy and management (funded by USDA-NIFA), the energetic consequences of restoration practices on stream fishes (funded by Illinois-Indiana Sea Grant), as well as work to prevent the spread of Asian carp into the Great Lakes (funded by US EPA, Great Lakes Restoration Initiative).

Multipurpose projects (benefits multiple programs)

This is not a multipurpose project.

Program income

This project will not generate any program income.

Useful Life

The project has no capital improvements. No funds are requested for equipment in excess of $5000, and the entire budget is allocated for laboratory/field supplies, personnel or travel. All supplies will be used for their useful life on similar research projects, and for their intended purpose.

Geographic location

Fish collections will occur within the Vermillion River Basin (Wabash River drainage), using DNR staff. It is challenging to identify specific sampling locations at this time as collection of this rare species can be unpredictable.

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