**RE 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 TO THE BOARD'S MARCH 10, 2020 QUESTIONS,** a copy of which is herewith served upon you.

Respectfully submitted,
MARATHON PETROLEUM COMPANY LP,

Dated: July 9, 2020

By: /s/ Melissa S. Brown
One of Its Attorneys

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## CERTIFICATE OF SERVICE

I, Melissa S. Brown, the undersigned, on oath state the following:

That I have served the attached **MARATHON PETROLEUM COMPANY LP'S RESPONSE TO THE BOARD'S MARCH 10, 2020 QUESTIONS,** via electronic mail upon:

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That my email address is Melissa.Brown@heplerbroom.com.

That the number of pages in the email transmission is 17 pages.

That the email transmission took place before 5:00 p.m. on the date of July 9, 2020.

/s/ Melissa S. Brown
Melissa. S. Brown

Date: July 9, 2020

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

| | | |
|---|---|---|
| MARATHON PETROLEUM COMPANY LP, | ) | |
| Petitioner, | ) | |
| v. | ) | PCB 18-49 (Thermal Demonstration) |
| ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, | ) | |
| Respondent. | ) | |

**MARATHON PETROLEUM COMPANY LP'S RESPONSES TO THE BOARD'S MARCH 10, 2020 QUESTIONS**

MARATHON PETROLEUM COMPANY LP ("Marathon"), by and through its attorneys, hereby files its Responses to the Illinois Pollution Control Board's ("Board") March 10, 2020 Questions. Marathon believes it is important to provide an appropriate context to the issues raised in the Board's questions. Therefore, Marathon first provides overarching arguments addressing the issues of zone of passage and avoidance behavior. Then, Marathon responds to each of the Board's questions.

## General

Zone of Passage

In addition to the requested alternative thermal effluent limitation ("ATEL"), Marathon is requesting relief from the allowed mixing zone requirement in 35 Ill. Adm. Code 302.102(b)(8). Petition to Approve Alternative Thermal Effluent Limitations, *Marathon Petroleum Company LP v. Illinois Environmental Protection Agency*, PCB 18-49 (Ill.Pol.Control.Bd. Dec. 15, 2017) ("Petition"). Relief under Section 316(a) of the Clean Water Act may include a mixing zone. Final Opinion and Order, *In the Matter of: Procedural Rules for Alternative Thermal Effluent Limitations under Section 316(a) of the Clean Water Act: Proposed New 35 Ill. Adm. Code Part 106, Subpart K and Amended Section 304.141(c)*, PCB R 13-20, at 11 (Ill.Pol.Control.Bd. Feb. 20, 2014) ("*Procedural Rules for ATEL*") ("Such petitioners may propose or rely upon a mixing zone. USEPA contemplates that a CWA Section 316(a) demonstration may address a mixing zone"). The Board has correctly characterized that Marathon's proposed relief, as requested, effectively eliminates the possibility for a zone of passage. As explained in the responses to the

Board's questions below, it is not possible for Marathon to create a zone of passage in Robinson Creek. However, pursuant to the Board's 316(a) regulations, the Board has the authority to grant relief from the mixing requirements in 35 Ill. Adm. Code 302.102. *Id*. at 12 (recognizing that dischargers may petition the Board for alternative standards from the thermal water quality standards, "as well as from the Board's mixing zone rules, 35 Ill. Adm. Code 302.102. . ."). This includes the authority to grant 316(a) relief that includes mixing without a zone of passage and mixing in waters containing endangered species habitat.

A petitioner for 316(a) relief must make the demonstration required by 35 Ill. Adm. Code 106.1160. 35 Ill. Adm. Code 106.1160(a)-(c). If a petitioner is seeking both an ATEL and relief from the mixing regulations, the petitioner is required to only make the 316(a) demonstration and is not required to show compliance with the mixing requirements in 35 Ill. Adm. Code 302.102. Final Opinion and Order, *Exelon Generation LLC v. Illinois Environmental Protection Agency*, PCB 14-123 at 46 (Ill.Pol.Control.Bd. Sept. 18, 2014).[1] The Board has explained that, "[t]o satisfy [Clean Water Act] Section 316(a), the mixing zone would need to ensure the protection and propagation of the balanced and indigenous population." *Id*. Per the Illinois Environmental Protection Agency ("Illinois EPA"), the 316(a) demonstration "is sufficient and accomplishes the same goals as mixing zone rules in Section 302.102." Final Opinion and Order, *Procedural Rules for ATEL*, PCB R 13-20, at 11 (citing Hearing Exh. 1 at 12).[2]

Marathon has made the required 316(a) demonstration and met its burden of proof under 35 Ill. Adm. Code 106.1160. The absence of a zone of passage within the proposed allowed mixing zone does not alter the results of Marathon's 316(a) demonstration, as demonstrated in prior filings and explained further below. The 316(a) demonstration was based on several locations within Robinson Creek, including RC05, which is 463 feet downstream from Outfall 001 and within the proposed allowed mixing zone. Marathon has demonstrated, and continues to demonstrate, that the requirements from which relief is requested (including the mixing rule from which relief is sought) are more stringent than necessary to assure the protection and propagation of a balanced and indigenous population of shellfish, fish, and wildlife in and on the receiving water, as required by the Board's regulations.

[1] In the rulemaking proceeding in which Part 106, Subpart K was promulgated, the Board discussed that a "hybrid petition" (a petition that requested both an ATEL and mixing relief) would also need to meet the criteria for an adjusted standard. *Id*. at 12. However, in a subsequent 316(a) proceeding, both the petitioner and Illinois EPA argued that compliance with the adjusted standard provisions is not required, only the 316(a) demonstration under Part 106, Subpart K is required. *See* Illinois EPA's Responses to Board Questions, *Exelon Generation LLC v. Illinois EPA*, PCB 14-123 at Question 14 (Ill.Pol.Contorl.Bd. July 16, 2014) ("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."); Exelon Generation LLC's Response to Board Questions, *id*. at Question 59 (Ill.Pol.Control.Bd. July 16, 2014). In the Exelon proceeding, the Board agreed with this analysis and ultimately granted Exelon's requested relief, which included mixing zone relief, without an adjusted standard showing. Final Opinion and Order, *id*. at 45-46 (Ill.Pol.Control.Bd. Sept. 18, 2014).

[2] For example, a petitioner seeking 316(a) relief that includes mixing relief would not need to show that it has met the requirement in 35 Ill. Adm. Code 302.102(b)(4), which states, in part, that mixing is not allowed in waters containing endangered species habitat. According to Illinois EPA, the 316(a) demonstration accomplishes the same purpose of this provision, as well as the other requirements in 35 Ill. Adm. Code 302.102.

Avoidance Behavior

First, as to Bigeye Chub, the Illinois Department of Natural Resources ("IDNR") mistakenly believes that Bigeye Chub (*Hybopsis amblops*) is a particularly thermally sensitive species (it is not even the most thermally sensitive of the Representative Important Species ("RIS") for this Petition) and, as a result, any disruption to its distribution pattern will adversely affect it. Bigeye Chub is listed as endangered in Illinois in part because it is a peripheral species in the state. Illinois is at the northwest extent of the Bigeye Chub's natural range (Lee et al. 1980[3]). When a species is at the edge of its range, it may give the impression that the species is particularly sensitive when, in fact, natural factors such as geology, winter or summer temperature extremes, etc. often control the distribution of such species. For example, Striped Shiner (*Luxilus chrysocephalus*) is one of the most common and widespread fishes in the central United States. However, its northerly distribution is limited and the species barely penetrates into Wisconsin. It is listed as an endangered species in Wisconsin, not because it is sensitive, but rather because it is a peripheral species that barely reaches into southeast Wisconsin (Becker 1983[4]). Another, perhaps more striking example of a peripheral species being listed as threatened or endangered is the Emerald Shiner (*Notropis atherinoides*). Emerald Shiner has what is probably the largest range of any Northern American minnow (Jenkins and Burkhead 1994[5], Page and Burr 2011[6]). Within its broad range, it inhabits large lakes, reservoirs, and medium to large rivers where it is often common to abundant (Lee et al. 1980, Page and Burr 2011). However, in Virginia, it is restricted to the Powell and Clinch Rivers where it is rare (Jenkins and Burkhead 1994). The Emerald Shiner is listed as an endangered species in Virginia, not because of its sensitivity, but rather because it is a peripheral species that reaches the eastern extent of its range in western Virginia (Jenkins and Burkhead 1994). Similarly, Bigeye Chub is a listed species in Illinois at least in part because it is at the northwest periphery of its range.

Long-term avoidance may be detrimental to a species if it is of sufficient duration or at a critical time period so as to prevent that species from feeding properly, from gaining access to needed spawning areas, or not allowing access to important nursery areas. However, these negative effects would result only if the avoidance behavior occurred over weeks or months. Here, as explained below, while short-term avoidance (i.e., hours or days) may occur due to the proposed relief, long-term avoidance behavior would not occur. The avoidance that may occur would occur during mid-summer and would not correspond to a critical time period for any of the RIS (i.e., during spawning in the spring). Short-term avoidance is a behavior that is beneficial to organisms as it allows them to avoid potentially harmful conditions. Further, it is important to understand that the proposed allowed mixing zone does not consist of habitat that is unique to this reach of Robinson Creek. Data collected by Midwest Biodiversity Institute ("MBI") show that habitat quality in the proposed mixing zone is similar to areas both upstream and downstream of the discharge. Biological and Water Quality Assessment of Robinson and Sugar Creeks and Tributaries, 2016, Exhibit 7 to Petition, PCB 18-49, at 54, Table 14. Thus,

[3] Lee, D., C. Gilbert, C. Hocutt, R. Jenkins, D. McAllister, and J. Stauffer Jr., 1980. Atlas of North American Freshwater Fishes. North Carolina State Museum of Natural History. Raleigh, NC. 867 p.
[4] Becker, G., 1983. Fishes of Wisconsin. University of Wisconsin Press, Madison, Wisconsin, 1052p.
[5] Jenkins, R. and N. Burkhead, 1994. Freshwater fishes of Virginia. American Fisheries Society. 1079p.
[6] Page, L. and B. Burr, 2011. Field Guide to Freshwater fishes. Houghton Mifflin Harcourt. 663p.

during potential avoidance, whether it is for a few hours or even a few days, fish simply move to nearby adjacent areas that provide all the life history needs of the species. Also, IDNR states that a zone of passage is necessary for "fish migrating upstream or downstream." However, Bigeye Chub is not migratory (Trautman 1981[7], Etnier and Starnes 1993[8]) nor are any of the other RIS. Marathon is not aware of any truly migratory species in Robinson Creek. Therefore, any movements are discretionary rather than obligatory.

Lastly, RC05 is the first temperature monitoring location downstream (463 feet downstream) of Outfall 001, while RC07 is 1.7 miles downstream at the IL Route 1 bridge. Technical Support Documentation for ATEL under Section 316(a) of the Clean Water Act and 35 Ill. Adm. Code 304.141(c) for the Marathon Petroleum Company LP Refinery located in Robinson, Illinois, Exhibit 4 to Petition, PCB 18-49 at 8 ("TSD"); Addendum to TSD, attached to Motion for Leave to File an Addendum to Exhibit 4 of the Petition, PCB 18-49 at 3, 5 (Feb. 27, 2018) ("Addendum"). Temperature monitoring and modeling results from both locations during the 2016 studies were included as part of the stress:recovery analysis of the Robinson Creek thermal regime as described in the TSD. These analyses showed that at RC05 the maximum number of consecutive hours that exceeded the maximum stress threshold of 90.7°F without a recovery period was only 14.5 hours based on the 2016 HOBO data at RC05, which is located within the proposed mixing zone, and only 5.0 hours based on the Environmental Fluid Dynamics Code ("EFDC") modeling. These minimal exceedances effectively demonstrate no appreciable adverse harm to the aquatic community at RC05.

This assessment did not change with the inclusion of Bigeye Chub as part of the RIS. Second Addendum to TSD, Exhibit 1 to Petitioner's Reply to IDNR's Response to Agency's Recommendation, PCB 18-49 at 4 (March 15, 2019) ("Second Addendum"). As part of requested ATEL, Marathon proposes a summer period maximum of 90°F and a summer average of 87°F. Petition at 20. The proposed summer maximum and summer average along with the existing limits on the magnitude of short-term exceedances and their durations are sufficient to preclude large swings in temperature that may be harmful. TSD, Exhibit 4 to Petition, at 21. Results of the UIUC thermal study suggest that the upper avoidance temperature for Bigeye Chub is 91.4°F and the critical thermal maximum as the equivalent upper lethal endpoint is 96.8°F. IDNR Response to Agency Recommendation, PCB 18-49, at 4 (Dec. 28, 2018). Both of these values are considerably higher than the 90.7°F maximum stress threshold and 87.1°F summer average evaluated at RC05, which is within the proposed mixing zone, for all RIS. Second Addendum at 4; Petitioner's Reply to IDNR's Response to Agency's Recommendation, PCB 18-49 at 5. Therefore, the requested 316(a) relief, which includes the mixing relief, is protective of the RIS considered in the demonstration, including Bigeye Chub.

**Board Questions**

**Question 12: In its March 5, 2020 order, the Board notes, "As it may do so in an ATEL petition, Marathon requests relief from Section 302.102(b)(8) of the Board's mixing zone regulation (35 Ill. Adm. Code 302.102(b)(8)). Marathon requests an expanded mixing zone that would eliminate any zone of passage.** ***The request goes well beyond the requirements of***

[7] Trautman, M., 1981. The fishes of Ohio. Ohio State University Press. 782p.
[8] Etmin D. and W. Starnes, 1993. The fishes of Tennessee. University of Tennessee Press. 689p.

***Section 302.102(b)(8), which, generally, require a 75% zone of passage or, under specified circumstances, a 50% zone of passage."*** **See PCB 18-49 Marathon Petroleum Company, LP (March 5, 2020), slip op. at 1 (emphasis added). Further according to USEPA 316(a) Manual, the demonstration must show that "fish communities will not suffer appreciable harm from: …Exclusion from *unacceptably large areas*…" USEPA 316(a) Manual at 28-29 *(emphasis added).* As proposed, the mixing zone would be 1.7 miles long with no zone of passage. Although Marathon argues that stress recovery periods would be provided, the temperatures within the mixing zone exceed the thermal tolerance thresholds for several fish species, not just the Bigeye Chub. With no zone of passage in this 1.7-mile-long stretch of Robinson Creek, fish migrating upstream or downstream would not have any means to avoid passing through the thermal plume.**

**Question 12(a): Please explain why Marathon declined to include a zone of passage in the proposed mixing zone for fish to migrate upstream or downstream even after IDNR raised concerns regarding thermal tolerance of bigeye chub, an Illinois endangered species.**

**Response:** Marathon declined to provide a zone of passage because, as explained in response to Question 12(b) below, a zone of passage is not possible in Robinson Creek. Additionally, a zone of passage is not necessary "for fish to migrate upstream or downstream" because, as described above and in more detail below, there are no migratory species that would be blocked by the proposed mixing zone. Furthermore, the period during which the most sensitive RIS would temporarily avoid the area would be short (hours or at most a few days) and does not occur during critical periods. At RC05, the maximum number of consecutive hours that exceeded a stress threshold of 90.7°F without a recovery period was only 14.5 hours based on the 2016 HOBO data and only 5.0 hours based on the EFDC modeling. TSD, Exhibit 4 to Petition, at 65, Table 14. As discussed in detail above, during this brief period, fish could successfully rest and feed in nearby adjacent areas. Even if it occurs, short-term avoidance would not inhibit Bigeye Chubs or any other species from successfully fulfilling necessary life functions.

**Question 12(b): If the Board decides to grant the requested ATEL with mixing zone relief that includes a zone of passage, please comment on the appropriate percentage of the volume of stream flow of that must be allowed for mixing instead of the proposed 100 percent.**

**Response:** It is not possible for Marathon to create a zone of passage in Robinson Creek. In a medium to large river, a thermal plume can sometimes be confined to one side of the receiving waterbody assuming laminar flow conditions and the downstream area being straight or nearly so. Assuming these conditions are met, the plume is "pinned" to one side of the river for a considerable distance downstream. However, in a stream the size of Robinson Creek, this will not occur. Robinson Creek is extremely shallow with depths ranging from as little as 2 inches in riffle areas to a maximum of only 20 inches in pools. Pools composed 50 percent of the RC05 sampling site while riffles made up approximately 20 percent of the reach. Further, the creek is narrow, ranging from approximately 23 to 31 feet and an average width of only 26 feet at the Outfall 001 discharge location. These physical elements dictate that fully mixed conditions will occur quickly in Robinson Creek. Modeling results indicate that fully mixed conditions will occur immediately downstream of the discharge. *See* Final Hydrodynamic and Temperature

Modeling Report for Robinson Creek, Exhibit 6 to Petition, PCB 18-49. Given these physical constraints, it will not be possible for Marathon to create a zone of passage. However, given the non-migratory nature of the RIS and the short period of time temperatures within the proposed mixing zone may cause potential avoidance behavior, Marathon's requested relief will still assure the protection and propagation of a balanced and indigenous population of shellfish, fish, and wildlife in and on Robinson Creek.

**Question 12(c): Please comment on the implications of including a zone of passage ranging from 25, 50, or 75 percent of the stream flow on the size of the mixing zone.**

**Response:** As discussed in the response to Question 12(b) above, given the physical constraints of Robinson Creek, it is not possible for Marathon to create a zone of passage.

**Question 13: On page 13 of Marathon's 8/15/18's Response to the IDNR it was stated "due to private property along Robinson Creek downstream from Marathon's Refinery, Marathon must negotiate access with private property owners in order to gain access significant enough for transporting, installing, maintaining, and monitoring the instream, continuous temperature sampling equipment. Retaining the compliance point in the vicinity of the IL Route 1 bridge will allow for comparatively reasonable access and flexibility for implementing equipment maintenance and sampling, as compared to a different location that would most likely be located further away from a public roadway and require a larger scope of access across private property".**

**Question 13(a): Please clarify whether Marathon would require the full 1.7 miles between the point of discharge and the IL Route 1 bridge to meet the proposed ATEL at the edge of the mixing zone?**

**Response:** The full 1.7 miles is not required to meet the proposed ATEL at the edge of the mixing zone. The IL Route 1 bridge compliance point was proposed by Marathon because it is consistent with the allowed point of compliance for monitoring downstream temperature in Marathon's current NPDES permit. Also, a compliance point (i.e., a permanent, instream temperature monitor) further upstream would require Marathon to gain access to the location entirely via private property along Robinson Creek downstream from Outfall 001. The area along Robinson Creek between Outfall 001 and the IL Route 1 bridge consists of wooded, private property. As explained in prior filings and noted in the Board's question, Marathon requires large enough access to Robinson Creek to transport, install, maintain, and monitor the sampling equipment. Given the wooded landscape of the areas along Robinson Creek, the potential points of sufficient access are limited, and all on private property. The proposed compliance point at the IL Route 1 bridge will allow for reasonable access and flexibility for implementing equipment maintenance and sampling, as compared to a different location that would likely be located further away from a public roadway and require more difficult access across private property. Moreover, moving the point of compliance upstream would not produce any added benefit. As explained herein, the requested ATEL and mixing relief will not result in any appreciable adverse impacts to the species in Robinson Creek, but will assure the protection and propagation of such species. Any short-term avoidance that may occur would not inhibit any species from successfully fulfilling necessary life functions.

**Question 13(b): If not, would it be possible to include a zone [of] passage the proposed mixing zone if the point of compliance is located at the IL Route 1 Bridge? If so, what percentage of the stream flow would the zone of passage occupy?**

**Response:** As discussed above, it is not possible to include a zone of passage regardless of where the point of compliance is established. This is because the shallowness and narrowness of Robinson Creek force mixing to occur almost instantaneously after the effluent enters the stream from Outfall 001. However, this lack of a zone of passage will not adversely affect the RIS, including Bigeye Chub, or any other species because avoidance temperatures will occur only for brief periods. Also, none of the species in Robinson Creek are migratory so any temporary avoidance will not materially affect them.

**Question 14: USEPA 316(a) Manual Section 3.3.5.1 specifies that the Petitioner must prove that fish communities will not suffer appreciable harm from "cold shock, excess heat, *reduced reproductive success or growth, exclusion from unacceptably large areas, or blockage of migration*". USEPA 316(a) Manual at 28-29 *(emphasis added)*. Please provide a detailed explanation with appropriate citations that the Bigeye Chub and the RIS will not suffer from reduced reproductive success or growth or exclusion from unacceptable large areas due to the absence of a zone of passage (blockage of migration).**

**Response:** The fish communities in Robinson Creek, including Bigeye Chub, are protected from appreciable harm from reduced reproductive success or growth or exclusion from unacceptably large areas as follows:

Appreciable harm from excess heat can only occur if fish are subjected to temperatures that exceed lethal thresholds, which seldom if ever occurs under ambient stream conditions. Fish will avoid temperatures that exceed lethal levels. The remaining potential modes of harm, including reduced reproductive success and growth, exclusion from unacceptably large areas, or blockage of migration, can each be the result of excess heat. All of these potential modes of appreciable harm were considered in the 316(a) TSD and addenda to the TSD. *See* TSD, Exhibit 4 to Petition; Addendum to TSD, attached to Motion for Leave to File an Addendum to Exhibit 4 of the Petition; Second Addendum, Exhibit 1 to Petitioner's Reply to IDNR's Response to Agency's Recommendation. This was done by performing a Type II 316(a) demonstration which necessarily relies on predictive analyses. A Type II demonstration was performed by using the Fish Temperature Modeling System (FTMS) applied to a list of RIS described at pages 11-14 of the 316(a) TSD. TSD, Exhibit 4 to Petition at 11-14. The application of the FTMS is described at pages 15-18 of the TSD and is how the risk of appreciable harm to the fish communities of Robinson Creek was determined. *Id*. at 15-18.[9] The most thermally sensitive species in the RIS controls the derivation of a summer average and daily maximum temperature that are protective of the RIS. The conclusion of no appreciable harm reached by the 316(a) TSD was based on a comparison of the most sensitive RIS thermal tolerance thresholds against measured and modeled temperatures in Robinson Creek downstream from the Outfall 001 discharge. *See* TSD, Exhibit 4 to Petition, at 20.

[9] The FTMS establishes scientifically derived endpoints for upper lethal temperature, avoidance temperature, optimum temperature for growth, as well as chronic lethal temperature and compares these endpoints to the modeled temperatures for the Marathon effluent.

Initially, Bigeye Chub was not included as part of the FTMS in the TSD because insufficient thermal tolerance data was available at that time to include it as a RIS. Second Addendum, Exhibit 1 to Petitioner's Reply to IDNR's Response to Agency's Recommendation, at 3. However, once the UIUC (Suski and Dai (2018)) thermal testing data on Bigeye Chub became available, Marathon was then able to include Bigeye Chub as a RIS in a rerun of the FTMS as documented in the Second Addendum to the TSD. The inclusion of thermal tolerance data for Bigeye Chub had no effect on the conclusions of the original TSD because Bigeye Chub is not the most thermally sensitive of the RIS. *Id*. at 4. In terms of the upper lethal threshold, Bigeye Chub ties for 10th (out of 25 RIS) most sensitive with Spotfin Shiner, Bluegill, and Spotted Bass, and for upper avoidance it ties for 6th most sensitive with Spotfin Shiner, Central Stoneroller, Bluntnose Minnow, Largemouth Bass, Bluegill, Green Sunfish, and Spotted Bass, so Bigeye Chub is clearly not the most thermally sensitive among the RIS. *See* Second Addendum. Adding the Suski and Dai (2018) thermal test data for Bigeye Chub did nothing to alter the FTMS outputs and by extension the 316(a) conclusions as a result. *Id*. at 4.

Growth is directly considered as a calculated value in accordance with United States Environmental Protection Agency ("U.S. EPA") methods and is one of the four FTMS input variables. TSD, Exhibit 4 to Petition, at Table 9, fn. a. The FTMS outlines the RIS requirements for growth in two of the five criteria for deriving a protective summer average temperature. TSD, Exhibit 4 to Petition, at 15-16. However, the influence of temperature on reduced reproductive success is not framed in a threshold exceedance manner, but rather by assuring a seasonal regime that provides for spring and fall periods of seasonal acclimation, as is depicted in Figure 10 (lower panel) of the TSD. *Id*. at 66, Figure 10. As a result, there are no thermal thresholds for reproduction in the FTMS, but rather this function is assured by maintaining normal seasonal regimes in the spring and fall months. The timing and success of reproduction is affected by several other factors in addition to temperature including flow, habitat, and day length.

Exclusion from unacceptably large areas due to excess heat is addressed in the FTMS by the maintenance of long-term survival temperatures for the most sensitive RIS via the summer period average. This approach addresses the potential for exclusion as a function of time and space. Per the analysis of the 2016 HOBO results, temperatures which RIS would likely avoid within 463 feet of Outfall 001 (i.e., within the proposed allowed mixing zone) occurred only 3.4% of the hours (74.4 total hours) in terms of cumulative time over the true summer period of June 16 – September 15. TSD, Exhibit 4 to Petition, at 19 and 65, Table 14. Furthermore, the exceedances occurred within multiple disjunct events, which would not result in the exclusion of unacceptably large areas of Robinson Creek to the RIS, including Bigeye Chub. The results of the stress:recovery analysis show that there are sufficient periods of temperature that are well below that which the most sensitive RIS would avoid thus allowing for the movement of fish both upstream and downstream from Outfall 001 during the critical summer period. Outside of the summer period, and when a portion of stream fish species populations would most likely move longer distances, the movement of fish would be completely unhindered as temperatures both within and outside of the mixing zone would be well below long-term avoidance thresholds.

Blockage of migration due to excess heat is not a concern with headwater stream fish communities because these species do not migrate in the classic meaning of that term. None of

the Robinson Creek RIS are either diadromous or potamodromous as part of their life history. Headwater fish species exhibit a sedentary life history which means that the majority of a population will occupy a home range consisting of the same reach of a stream for their entire lives. They do not exhibit the life history traits of species such as Salmon that migrate long distances or freshwater species such as Walleye that traverse between large rivers and tributary streams as part of their respective life histories. Simply stated, fish species in Robinson Creek are not migratory, i.e., they do not depend on migration past Outfall 001 to survive as a species. Marathon acknowledges that a fraction of a species population will move beyond their home range within their parent watershed, which is the mechanism by which Bigeye Chub likely arrived in Robinson Creek, both downstream and upstream of Outfall 001. Addendum to TSD, attached to Motion for Leave to File an Addendum to Exhibit 4 of the Petition, at 1-3. However, these are not the classic migratory movements that the United States Environmental Protection Agency ("USEPA") 316(a) guidelines were originally intending to protect. Further, the stress:recovery analysis shows that temperatures in Robinson Creek will permit free movement of the most sensitive RIS for a majority of the time during the summer months when ambient temperatures are the highest and certainly during the non-summer months when most fish movement occurs. The long-term survival threshold provides for this population function in Robinson Creek.

**<u>Question 15</u>: As noted in Question 9 for IEPA, MBI's analysis of the duration and severity of thermal stress periods refers to temperatures recorded at the RC07 sampling point approximately 1.7 miles downstream of Outfall 001, which is near the proposed location for compliance sampling and the edge of the mixing zone in Marathon's petition. Additionally, the daily temperature profiles during the summer of 2016 for Robinson Creek at the RC05 sampling point, approximately 750 feet downstream from Outfall 001 and within the proposed mixing zone indicate temperature above 90°F standard for as long as 4 days at a time.**

The MBI analysis of the duration and severity of thermal stress periods, and upon which the conclusions of the 316(a) demonstration are based, was done using the HOBO results at RC05. TSD, Exhibit 4 to Petition, at 65, Table 14. The same analysis using the EFDC modeled temperature results included in Table 14 of the TSD is likewise based upon results at the RC05 location. *Id*. Temperature exceedances at RC07 and RC09 are summarized in Table 7 of the TSD which shows the frequency of exceedances as being much lower than at RC05. *Id*. at 56, Table 7.

There is no evidence in Figure 10 or Table 14 of the TSD to support the statement that temperatures at RC05 exceeded 90°F for a consecutive period of four days. The cumulative total of HOBO readings at RC05 between July 13 (9:00 AM) and September 14 (7:40 AM), 2016, exceeding proposed ATEL of 90°F was 561 readings out of 9004 total readings or 6.23% (readings were recorded every 10 minutes). The stress periods were counted as the *consecutive hours* that the short-term survival temperature of 90.7°F was exceeded within the period of July 13-September 14. The longest single consecutive period was 14.5 consecutive hours or 0.604 days. There were four individual stress periods over four consecutive days between August 10-13 that totaled 33.7 hours or 35.1% of that 96-hour period. Over the entirety of the summer

season, recovery periods occurred at a rate of more than 10 times the stress hours (e.g., 74.4 stress hours vs. 779.3 recovery hours).

The Board's question also refers to the RC05 sampling point as being "approximately 750 feet downstream from Outfall 001". However, the location of the RC05 HOBO monitor upon which the stress:recovery analysis is based is approximately 463 feet downstream from Outfall 001.

**Question 15(a): Given that Marathon is not proposing a zone of passage, please evaluate the duration and severity of stress periods within the mixing zone when temperatures are above the thermal tolerance of bigeye chub and other RIS.**

**Response:** The duration of stress periods within the proposed allowed mixing zone are conservatively represented by the stress:recovery analysis summarized in Table 10 of the TSD. TSD, Exhibit 4 to Petition, at 60, Table 10. As a result, the analysis and conclusions reached by the TSD and the two Addenda, which are summarized in relevant part above, are applicable to the proposed allowed mixing zone.

**Question 15(b): Provide a detailed explanation with appropriate citations to the record that demonstrates that a fish traversing the 1.7-mile segment, behaving erratically or near loss of equilibrium, would be expected to successfully navigate the 1.7-mile segment upstream or downstream to find thermal refuge during the times when cooler temperatures exist to experience an adequate period of stress recovery.**

**Response:** A fish would likely not experience prolonged "erratic behavior" or a "near loss of equilibrium" because it would avoid the conditions that may cause these responses altogether. *See* TSD, Exhibit 4 to Petition, at 8-9. The following observations in the Suski and Dai study tend to support the conclusion that, in an open system like Robinson Creek, fish will avoid temperatures that would cause a response of erratic behavior or a near loss of equilibrium: the 5-degree difference in acclimation temperatures (21 to 26 °C) did not have an impact on swimming ability, including burst swimming speed used to avoid predators (and presumably changing water temperatures); there was a 27% increase in burst swimming speed at the higher acclimation temperature considered; and swimming performance in the study's swim tunnel likely underestimates true swimming ability in a stream. "Effects of Acclimation Temperature on Critical Thermal Limits and Swimming Performance of the State-Endangered Bigeye Chub" (Aquatic Biology, Oct. 2019), Attachment A to IDNR's Answers to Questions of the Hearing Officer for the Board, PCB 18-49, at 141, 143-144 (July 7, 2020).

Moreover, it is highly unlikely that prolonged "erratic behavior" or a "near loss of equilibrium" could ever happen over the full length of the 1.7 miles of the proposed mixing zone given the low frequency of exceedance of the short-term survival thresholds within 0.1 mile of Outfall 001 as depicted in Table 14 of the TSD. *Id*. at 65, Table 14. The Board's question appears to suppose that because Marathon is proposing a 1.7-mile long mixing zone that temperatures would frequently enough exceed the short-term survival threshold for the most sensitive RIS, which is 90.7°F, over that entire distance. The reality is that within 463 feet of Outfall 001 the longest consecutive period of stress temperatures was only 14.5 hours in 2016,

hence the duration of exceedance of the short-term survival threshold would be much less and likely closer to zero for the majority of the 1.7 miles. *Id.* Recovery temperatures were 10 times more frequent than stress temperatures and were of longer duration at RC05, which is sufficient for all RIS including Bigeye Chub to traverse Robinson Creek downstream and upstream of Outfall 001. *Id.*

**Question 16: MBI states, "While it is true the impaired status of Robinson Creek precludes a Type I demonstration (no prior appreciable harm), recent results show the creek to be on a trajectory of improvement in response to abatement of non-thermal chemical impacts." Exh. 4 at 2. Marathon follows, "[T]he current Outfall 001 thermal discharge should not preclude recovery of the resident biota to meet the Illinois General Use for aquatic life." Pet. At 21. Given the trajectory of improvements with respect to chemical impacts and recovery of the resident biota, comment on whether including a zone of passage in the mixing zone would be beneficial to restoring Robinson Creek to meet the General Use Aquatic life.**

**Response:** First, including a zone of passage is not possible as discussed in Marathon's above responses. Second, theoretically, including a zone of passage would not be any more beneficial to restoring Robinson Creek to meet the General Use standard for aquatic life because RIS can pass through the proposed mixing zone during most hours in the summer and at any time during the non-summer seasons, as explained above.

**Question 17: Referring to Question 10, please comment on whether the thermal data based on two grab samples taken on a weekly basis is adequate to discern temperature peaks that might adversely affect bigeye chub or the RIS within the 1.7-mile mixing zone.**

**Response:** Marathon's current NPDES permit requires two grab samples on a weekly basis to monitor temperature. NPDES Permit No. IL0004073, Exhibit 1 to Petition, at 2. However, the current draft of Marathon's renewal NPDES permit, which Marathon understands will be issued after conclusion of this proceeding, includes a continuous, in-stream temperature monitoring requirement. This requirement will be adequate to discern temperature peaks that might affect RIS, including Bigeye Chub, within the proposed allowed mixing zone.

**Question 18: Marathon contends that an ITA has no place in this proceeding because the "proposed 87 F summer average is lower than the avoidance (91.4°F) and critical thermal (96.8°F) temperatures identified by the UIUC Bioassay. The proposed summer period maximum of 90°F produced by the MBI study supporting the Petition is lower than both temperatures identified by the UIUC Bioassay." 3/15/19 Marathon Resp. at 12-13.**
**Question 18(a): Given that the proposed ATEL apply at the edge of the 1.7-mile mixing zone, which does not include a zone of passage, and the record indicates temperatures above the tolerance levels of bigeye chub and the RIS within the mixing zone, please comment on why IDNR's recommendation that "Marathon pursue an ITA has no place in this proceeding and should be dismissed as irrelevant".**

**Response:** An Incidental Take Authorization ("ITA") should not be considered by the Board in this proceeding because Marathon has demonstrated that the requested 316(a) relief will assure

the protection and propagation of a balanced and indigenous population of shellfish, fish, and wildlife in and on Robinson Creek. As explained above, at RC05, the maximum number of consecutive hours that exceeded a stress threshold of 90.7°F without a recovery period was only 14.5 hours based on the 2016 HOBO data and only 5.0 hours based on the EFDC modeling. These minimal exceedances effectively demonstrate no appreciable adverse harm to the aquatic community within the proposed allowed mixing zone. Additionally, the results of the UIUC thermal study suggest that the upper avoidance temperature for Bigeye Chub is 91.4°F and the critical thermal maximum as the equivalent upper lethal endpoint is 96.8°F. Both of these values are considerably higher than the 90.7°F stress threshold evaluated at RC05, in the proposed mixing zone, for all RIS. Therefore, the requested 316(a) relief is protective of the RIS considered in the demonstration, including Bigeye Chub.

Illinois EPA has agreed that the requested relief is protective of the RIS, stating 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." Illinois EPA Recommendation, at 5-6 (Ill.Pol.Control.Bd. Sept. 7, 2018); *see also* Illinois EPA's Reply, PCB 18-49, at 3 (Ill.Pol.Control.Bd. Apr. 12, 2019) ("Based on the data received, the range of spawning temperatures for the Bigeye Chub and an RIS of the Bigeye Chub are protected by the temperature limits proposed by the alternative thermal effluent limit."); *id*. at 3 ("The UIUC study has not changed the Agency's recommendation to grant the proposed alternative thermal effluent limit."). Because the requested 316(a) relief is protective of the RIS, including the Bigeye Chub, there is no need to consider an ITA.

Furthermore, an ITA should not be considered because IDNR has not established that a take will in fact occur as a result of Marathon's requested relief. There is no basis for IDNR's argument that avoidance behavior constitutes a "take" under the Illinois Endangered Species Protection Act (520 ILCS 10) ("Illinois ESA"). "Take" is defined as "to harm, hunt shoot, pursue, lure, wound, kill, destroy, harass, gig, spear, ensnare, trap, capture, collect, or to attempt to engage in such conduct." 520 ILCS 10/2. The Illinois ESA does not mention avoidance behavior, let alone provide a basis for avoidance behavior to constitute a take. Marathon did not find any Illinois statutory, regulatory, or case law support for the assertion that avoidance behavior constitutes a take under the Illinois ESA. IDNR also has yet to provide any regulatory, statutory, or case law support for its assertion that avoidance behavior constitutes a take either on its own or as a form of harassment or harm. As explained above, the potential for avoidance behavior by Bigeye Chub due to Marathon's requested relief is remote.[10] Bigeye Chub is not a particularly thermally sensitive species and, like all other species in Robinson Creek, is non-migratory. Even if avoidance behavior did result, it would be for very short periods and the fish can simply move to nearby adjacent areas that provide all the life history needs of the species. This is because the habitat quality in the proposed mixing zone is similar to areas both upstream and downstream of the discharge. The proposed mixing zone with no zone of passage would not adversely affect the habitat of the Bigeye Chub. Ultimately, IDNR has not established that this remote potential for short-term avoidance behavior constitutes a take under the Illinois ESA.

[10] This remote potential for a take is the main reason that Marathon concluded, based on discussions with IDNR, that applying for an ITA is not warranted. Petitioner's Motion for Leave to File Supplement at 3 (June 4, 2019).

**Question 18(b): Please comment on whether seeking an ITA approval could be viewed as an alternative to not providing for "a zone of passage" in the proposed mixing zone to alleviate the possibility of Marathon's operations being in "the constant risk of noncompliance for "taking" the Bigeye Chub found in Robinson Creek," as noted by IDNR, as well to improve the conditions of Robinson Creek to meet the General Use aquatic life.**

**Response:** No, seeking an ITA could not be viewed as an alternative to not providing a zone of passage in the proposed mixing zone. First, obtaining an ITA is a separate and distinct process from a 316(a) proceeding. ITAs are issued by IDNR and governed by IDNR regulations. The Board has no authority under the Illinois Environmental Protection Act, 415 ILCS 5, to require issuance of an ITA. IDNR itself has no authority under the Illinois ESA to require an entity to obtain an ITA. 520 ILCS 10/5.5 (Section 5.5 of the Illinois ESA, which governs ITAs, states that IDNR *may* authorize an incidental taking); 17 Ill. Adm. Code Part 1080. IDNR has confirmed there is no legal authority upon which the Board or IDNR can require an ITA. IDNR's Answers to Questions of the Hearing Officer for the Board, PCB 18-49, at 2 (July 7, 2020).[11] Instead, it is the project proponent's decision, based on their own risk assessment, whether to apply for an ITA.

Furthermore, it is Marathon's understanding that an ITA can be used to improve habitat conditions of the endangered or threatened species, either in the receiving water or elsewhere. *See id*. In other words, the negotiated conditions of an ITA are used to offset any harm that may be caused to the species by the entity obtaining the ITA. However, as explained above, Marathon's requested relief, which includes mixing with no zone of passage, will assure the protection and propagation of balanced, indigenous population of shellfish, fish, and wildlife, including the Bigeye Chub. No measurable adverse harm to the Bigeye Chub, or any RIS, will result due to Marathon's requested relief and, therefore, there is no harm to an endangered or threatened species that needs to be offset by obtaining an ITA. Moreover, as addressed in the "General" section above, the Board has authority in 316(a) proceedings to grant relief from the mixing requirements, including relief from the zone of passage requirement. Because the Board has the authority in 316(a) proceedings to grant an ATEL with mixing and no zone of passage, no "alternative" to a zone of passage is needed here. Lastly, IDNR can avail itself of its options relating to "take" under the Illinois ESA, and Marathon can exercise its option to apply for an ITA, at any time. Those options are not affected by this proceeding, and therefore, should not be considered by the Board here.

[11] An issue concerning IDNR and Board authority was addressed in the rulemaking proceeding that adopted the provisions of 35 Ill. Adm. Code Part 106, Subpart K. In the rulemaking, an interested party argued that consultation between IDNR, or a federal agency like U.S. Fish and Wildlife Service, and Illinois EPA should be a mandatory requirement under the 316(a) regulations. Final Opinion and Order, Procedural Rules for ATEL, PCB R13-20 at 9. However, the Board did not adopt the proposed mandatory requirement, explaining that "it has no statutory authority to require another state agency like DNR or a federal agency like FWS to consult with the Agency regarding these petitions." *Id*. Likewise, here, the Board has no statutory authority to insert itself into the ITA process and require an ITA.

**Board Question 6 Directed to IDNR**

The Board's questions directed to IDNR included questions concerning the incidence of deformities, erosions, lesions, and tumors ("DELTS") in Robinson Creek. Hearing Officer Order, PCB 18-49, at 3 (March 10, 2020). Marathon offers the following, which addresses IDNR's July 7, 2020 response to Question 6:

First, it is important to note that none of the Bigeye Chub found in Robinson Creek exhibited DELT anomalies. Second, in response to IDNR's August 2018 comments, MBI referenced the only study that showed a direct relationship between temperature and DELTs. As previously explained by MBI, the Hockett and Mundahl (1989) study was the only study that it could find which tested the effect of disease on fish thermal tolerance. Analysis of and Response to IDNR March 29, 2018 Comment Letter, Exhibit 1 to Marathon's Response to IDNR's Consultation Letter, Dated March 29, 2018, PCB 18-49 at 11 (Aug. 15, 2018). MBI had conducted a reasonable search for additional studies that showed elevated temperatures as a controlling factor in the incidence of DELTs observed in Robinson Creek and found none. *Id*. In its response, IDNR cites to additional literature that only provide generalized conceptual and theoretical analysis, which is speculative at best, as opposed to measurement or direct observation. Based on IDNR's discussion of the literature, it appears the literature cited only provides general academic references to temperature effects being associated with DELTs (or DELT-like symptoms), but do not have much, if any, relevance to the specific characteristics of Robinson Creek. For example, one study cited by IDNR is the Esch et al. (1976) study. This study was performed on fish exposed to thermal discharges to ponds from nuclear reactors at the Savannah River Reservation. In that study, the temperatures involved were much more extreme than those in Robinson Creek and thus not relevant here.

Third, MBI did not perform a "cursory literature review" as IDNR suggests. MBI performed an original analysis that was empirical, geographically relevant, and represents the reality of multiple non-thermal stressors that contribute to elevated DELTs. *Id*. at 10-11 (MBI's search for studies included "the several hundred thermal references that have been examined over the past 40 years in building the FTMS thermal effects database."). Lastly, as explained in prior filings, the Bioassessment Report and MBI's analyses supports the assessment that DELTs in Robinson Creek are the result of non-thermal pollution influences and the thermal regime of Robinson Creek does not play a role in the observed biological assemblage impairments. Marathon's Response to IDNR's Consultation Letter, Dated March 29, 2018, PCB 18-49 at 11 (Aug. 15, 2018).

Marathon appreciates the opportunity to respond to the Board's questions, and respectfully renews its request that its Petition be granted by the Board.

Respectfully submitted,

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