



Tennessee Valley Authority, 1101 Market Street, BR 2C, Chattanooga, Tennessee 37402-2801

January 17, 2020

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Mr. Vojin Janjić
Division of Water Resources
Tennessee Department of Environment
and Conservation (TDEC)
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Dear Mr. Janjić:

TENNESSEE VALLEY AUTHORITY (TVA) – SEQUOYAH NUCLEAR PLANT (SQN) – NPDES PERMIT NO. TN0026450 – AMENDED PERMIT APPLICATION – REQUEST TO CONDUCT A PREDICTIVE CLEAN WATER ACT (CWA) SECTION (§) 316(a) DEMONSTRATION

TVA is in receipt of your letter dated October 24, 2019, responding to TVA's request that the NPDES permit renewal for SQN currently being drafted by TDEC include a provision for TVA to conduct a predictive CWA § 316(a) demonstration study within the first six months of the effective permit term for TDEC review and determination. The request was to determine if a less stringent temperature rise standard for the plant discharge could be supported for the months of October and April based on available scientific data on the life history requirements of representative important fish species in Chickamauga Reservoir.

In its letter, TDEC declined TVA's request stating: "We are not able to accommodate your request to include a study in the permit along with permit terms and conditions that would conditionally apply depending on the outcome of the study." TVA respects TDEC's decision to deny its request on this basis. However, TVA was surprised that TDEC went further and indicated, we believe prematurely, that even if a predictive § 316(a) demonstration supported a less stringent alternate thermal limit for SQN during October and April, TDEC could/would not accept it in the NPDES permit for SQN. We believe this position is unsupported.

TDEC's comments and TVA's responses are provided below:

TDEC Comment: TDEC advised that Tennessee regulations "do not allow for the relaxing of permit conditions with which the permittee is in substantial compliance." Indicating further: "the division is limited by the anti-backsliding provision outlined in Rule 0400-40-05-.08(1)(j) which states, in part: 'when a permit is renewed or reissued, effluent limitations, standards, or conditions shall be at least as stringent as the effluent limitations, standards, or conditions in the previous permit.'"

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TVA Response: A demonstrated protective alternative temperature standard under § 316(a) meets the temperature limits of the water quality regulations and does not constitute backsliding. TVA believes that TDEC's interpretation of the anti-backsliding provision in Rule 0400-40-05-.08(1)(j) to preclude application of alternative temperature limits under § 316(a) is flawed because it fails to read that provision in context with Rule 0400-40-03-.03(3)(e), pertaining to temperature requirements for Fish and Aquatic Life uses, and Rule 0400-40-03-.06(1)(a), TDEC's Anti-Degradation Statement.

Rule 0400-40-03-.03(3)(e) provides that: "A successful demonstration as determined by the Department conducted for thermal discharge limitations under Section 316(a) of the Clean Water Act, (33 U.S.C. §1326), shall constitute compliance with this paragraph." (emphasis added) Section 316(a) provides that less stringent temperature limitations are supported where it can be demonstrated by the permittee that the current temperature limitations are "more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge is made." [40 CFR §125.70]. TDEC's rule provides that the less stringent temperature standard becomes the site-specific and, importantly, the demonstrated protective temperature standard for the facility.

Further, the less stringent temperature standard does not constitute degradation of existing uses. TDEC's Anti-Degradation Statement states that: "Where new or increased temperature alterations are proposed, a successful demonstration as determined by the Department under Section 316(a) of the Clean Water Act, 33 U.S.C. §1326, shall be considered to be in compliance with this rule."

Read together, these provisions make clear that a demonstrated protective alternative thermal standard meets the temperature limits of Rule 0400-40-03-.03(3)(e) and is consistent with TDEC's Anti-Degradation Statement.

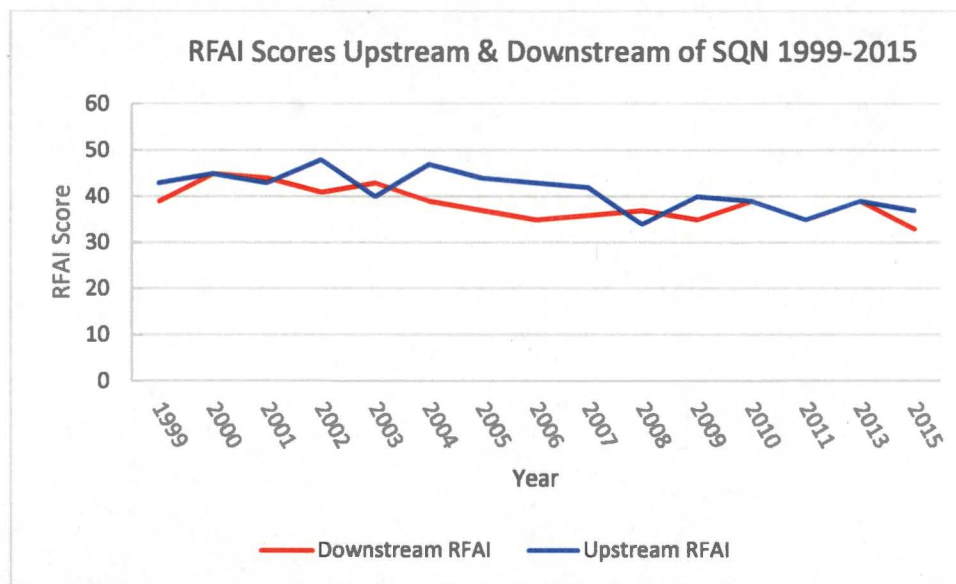
TDEC's anti-backsliding provisions found in Rule 0400-40-05-.08(1)(j) include exceptions largely copied from 33 U.S.C. §1342(o)(2). Section 1342(o)(2)(D) specifically exempts permit modifications granted under § 316(a). Although TDEC's anti-backsliding provisions do not include the language of § 1342(o)(2)(D), this is readily explained by the fact that it would have been unnecessarily redundant to do so given that Rule 0400-40-03-.03(3)(e) and Rule 0400-40-03-.06(1)(a) specifically provide that alternative thermal limits under § 316(a) comply with temperature and anti-degradation requirements. In addition, there is nothing in the record on the development of the anti-backsliding rule that supports any interpretation that TDEC specifically intended to abrogate the § 316(a) exemption to backsliding provided under the Clean Water Act.

In summary, authorizing an alternate thermal limit in a renewed or modified NPDES permit that is less stringent than the thermal limit in the preceding permit does not constitute backsliding under TDEC regulations.

TDEC Comment: "Moreover, even if the anti-backsliding provisions of our rules weren't controlling, we additionally have significant reservations about the appearance of a decline in reservoir ecological health both upstream and downstream from the Sequoyah Plant."

TVA Response: TDEC provided a graphic prepared by its Water Resources Division based on TVA-reported Reservoir Fish Assemblage Index (RFAI) scores for Chickamauga Reservoir from 1999 to 2015 showing a slight, but discernible, downward trend in score values for sampling stations upstream and downstream of SQN.

TVA has reproduced the graphic prepared by TDEC below¹:



As TDEC noted, the observed trend of declining RFAI scores from 1999 through 2015 is present at both the upstream and downstream locations. Importantly, this is an indication that SQN operation, specifically the thermal discharge, is not the likely causative factor for the decline.

As presented at our meeting on November 13, 2019, the observed trend in RFAI scores for the period 1999-2015 is statistically significant ($p < .05$); however, that has not been the case for over a decade (since 2006) where RFAI scores at both locations have remained relatively stable (i.e., no statistically significant declining trends for 2006-2017).

TVA biologists believe there are a number of issues at play being manifested in the RFAI score trends and make these initial observations:

¹ TVA data used by TDEC to develop its chart were subsequently revised based upon further review/analysis; however, the changes were slight and do not negate TDEC's observations about a general decline in RFAI scores from 1999 through 2015.

- Expanded establishment of aquatic plants in Chickamauga Reservoir since 2007 in shallow shoreline areas where fish sampling occurs has indirectly resulted in decreased overall scores.
- Aquatic vegetation was likely present before 2007, but the low flow/drought conditions of 2007 likely allowed the plants to get better established, and grow and expand.
- Due to physical access limitations for our electrofishing boats caused by dense aquatic vegetation, we now sample more aquatic plant *boundary* and less actual shoreline habitat (e.g., tree tops, riprap, rock outcrops) resulting in increased collections of bluegill in samples since 2008.
- Bluegill are considered tolerant species. Their apparent increased presence has negatively influenced several RFAI proportional metrics, mainly: "tolerant individuals", "dominance by one most numerous species", and "top carnivore individuals."
- The apparent increase in bluegill has been the main driver for the general proportional decrease in percent top carnivore values. However, two top carnivore species have decreased in numbers collected: yellow bass and spotted bass, possibly due to their affinity for dense aquatic vegetation that is difficult to sample effectively.
- All other top carnivores (e.g., largemouth bass, black crappie) have remained stable.
- Overall, species diversity has remained stable at all sites among the years surveyed.
- Additionally, data actually show significant relationships at each site between numbers of bluegill we collect and river flows during their spawning months from the previous year.
 - It appears dry years with low flow (2007, 2012, & 2016) allow plants to grow thick, favoring bluegill spawning and survival. We then collect more bluegill in following year.
 - In higher flow wet years, aquatic vegetation either doesn't get established or grow as thick, thereby reducing spawning success or just not providing sufficient refuge for young to avoid predation. We then collect fewer bluegill the following year.

In summary, we believe the primary driver for the reduced long-term RFAI scores in Chickamauga Reservoir is related to: 1) physical habitat changes due to the establishment of aquatic vegetation over the past decade, 2) the interplay of annual variations in river flows on the status of the aquatic vegetation community, 3) the related effects on fish community structure, and 4) our ability to effectively sample that community using current methods.

TDEC Comment: Regarding the observed declining trend in RFAI scores, TDEC states that: "... in an effort to be protective of Chickamauga, we would be extremely reluctant to authorize additional thermal loadings to the lake in light of this overall trend."

TVA Response: Chickamauga Reservoir is a man-made, artificial environment with regulated flows and seasonally-controlled, fluctuating water levels. The observations TVA noted above regarding influential factors for the decline in RFAI scores (1999-2015) point more to "natural" mechanisms related to habitat changes and associated fish community response, and/or

sampling limitations, rather than from regulated discharges (or "stressors"). With the phenomena observed both upstream and downstream of SQN (as TDEC has noted), thermal loading from the plant is not at play here. Further, the observed trend in RFAI scores since 2006 have been relatively stable compared to the overall trend for the 1999-2015 period.

TVA has demonstrated recurrently that the existing SQN alternate thermal discharge limit for temperature rise during November through March has resulted in no appreciable harm to the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife in Chickamauga Reservoir. That is the definitive measure the regulations provide for considering if a § 316(a) demonstration has been successful in compliance with Rule 0400-40-03-.03(3)(e) and Rule 0400-40-03-.06(1)(a).

While RFAI scores are important indicators of overall fish community health, a § 316(a) study requires the permit applicant to demonstrate the protection and propagation of a balanced, indigenous population (BIP) of fish, shellfish, and wildlife in the waterbody based on five elements specified by EPA Region 4. These definitional elements of a BIP include:

1. A population typically characterized by diversity at all trophic levels,
2. The capacity to sustain itself through cyclic seasonal changes,
3. Presence of necessary food chain species,
4. Non-domination of pollution-tolerant species, and
5. Presence and support of indigenous species.

These regulatory elements of a BIP differ in approach, scope, and purpose from an Index of Biotic Integrity (IBI) program such as the RFAI. That is, there may not always be complete agreement between the two approaches, which is why EPA Region 4 has been historically reluctant to accept TVA's RFAI assessments as the sole evidence for a BIP when determining if a § 316(a) demonstration has been successfully executed. Aquatic community assessments using conventional methods and augmented by RFAI assessments can provide a more holistic view for evaluating thermal discharge effects. For this reason, TDEC should be reluctant to rely solely on perceived trends in the RFAI as a predicate for prematurely and without study assuming that a slight increase (1°C) in the state temperature rise criterion for the SQN thermal discharge in October and April would not support a BIP in Chickamauga Reservoir.

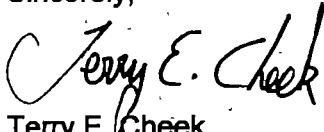
In summary, TVA acknowledges TDEC's concern about the overall ecological health in Chickamauga Reservoir and will continue to monitor the health of the reservoir and analyze the existing data to better understand the drivers behind the observed RFAI trends.

However, should TVA move forward with a CWA § 316(a) demonstration study at SQN to determine if a less stringent temperature rise standard can be supported for the months of October and April, we respectfully request that TDEC not foreclose such a demonstration based solely on trends in a reservoir-wide RFAI that captures stressors beyond SQN's discharge and instead base any determinations about a successful demonstration on the role the thermal discharge has on a BIP, as supported by the regulations.

Mr. Vojin Janjić
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If you have questions or need additional information, please contact Travis Markum at (423) 751-2795 or by email at tmarkum@tva.gov.

Sincerely,



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