



Tischler/Kocurek
Environmental Engineers

November 13, 2017

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Attn: Standards Implementation Team (MC-150)

Re: Draft Implementation Procedures for Thermal Effluents (October 2017 version)

Ladies and Gentlemen:

Tischler/Kocurek (T/K) is pleased to offer these comments on the draft language for the 2017 implementation procedures (IP) for the Texas surface water quality standards describing how the Texas Commission on Environmental Quality (TCEQ) will determine when temperature limits are required in TPDES permits in order to achieve the temperature standards at 30 TAC 307.

Our comments are organized into three sections: (1) responses to TCEQ's comment request list; (2) implementation procedures and (3) permit applications.

TCEQ COMMENT REQUEST

T/K's responses to the specific TCEQ requests for comments are as follows:

- Create standard default language for thermal plume Other Requirement language. *We believe that the language should be essentially the same as the permit provisions that are currently used for zones of initial dilution/mixing zones.*
- Input on how to calculate temperature limits. *See comments above.*
- Determine whether to include daily average requirements and how to calculate limits. *Because of the way that the current temperature standards are described in the water quality standards, there is no added value for including daily average temperature limits in permits.*
- Create option to delineate thermal wastestreams in the industrial permit application. *It would be more useful for the TPDES application to characterize final effluent temperature as average, minimum, and maximum for seasonal periods, where that data are available or can be estimated. This could be done by changing Table 1 of Worksheet 2.0 to require that the permittee provide*

107 South Mays
Round Rock, Texas 78664
512.244.9058
512.388.3409 FAX

estimated maximum, average, and minimum effluent temperatures rather than temperatures during sampling for the application. The U.S. Environmental Protection Agency's NPDES application EPA Form 3510-2C requires applicants to provide maximum, minimum, and average temperatures for both winter and summer periods. Most states that T/K works in other than Texas, use the NPDES Form 2C and applicants are required to provide values based on measurements (preferred) or estimates. Alternatively, TCEQ can modify the proposed table of internal streams by requiring applicants to provide an estimated maximum temperature of each internal stream, and include in the treatment system flow balance diagram required by the application, an indication of where each thermal stream enters the collection and treatment system.

- *Option to express thermal requirements as loading limits and how to calculate them. This would appear to be a needless complication given that such limits would require back-calculation of allowable thermal loads using ambient temperature data and the resulting loading would not offer any additional protection.*
- *How site-specific ambient temperature can be calculated. See comments above. TCEQ should specify the probability associated with the ambient background temperature to be used for analysis when the temperature is derived from SWQM or other site-specific monitoring data.*
- *Thresholds for when temperature screening is or is not needed where thermal wastestreams are a small proportion of overall discharge. No comment.*
- *Default background temperature assumption of 30.5 degrees Celsius (°C). As described by TCEQ this is appropriate. However, TCEQ may wish to consider developing segment-specific background temperatures from the SWQM database and tabulate these in the IP, as it currently does for pH, hardness, and 7-day, once-in-two years low flows.*

IMPLEMENTATION PROCEDURES

General Information

No comments

Screening Approach

In the introduction to the screening approach, the proposed language states that discharges through holding ponds with 48 hours or greater hydraulic retention time that discharge to a classified segment will not require screening. The term “holding” pond could be misinterpreted to apply only to impoundments that are designed to store effluent. We suggest that the TCEQ broaden the description of the 48-hour retention time to include surface impoundments, flow-through ponds, and open ditches.

Simple Heat Balance

In the introduction to this IP provision. TCEQ states that it will “use critical dilutions consistent with the aquatic life mixing zones normally employed for toxic

pollutants.” T/K supports this approach, but recommends that two different “mixing zones” analogous to those used for toxic pollutants be used to apply the heat balance equations.

The default chronic aquatic life protection mixing zone for toxics as used in TCEQ’s examples is appropriate and protective for applying the maximum temperature criterion. The TCEQ maximum temperature criteria are established to be protective of aquatic life for exposure times that are equivalent to the exposure times for the chronic aquatic life criteria for toxic pollutants (typically, 7 days). The numeric temperature standards are established to protect aquatic life from long-term exposure to maximum water temperatures that may have sub-lethal effects on aquatic species. The default chronic mixing zones for toxics are likewise based on preventing sub-lethal effects on aquatic species. Thus, setting the default chronic toxicity mixing zones and default mixing zones for the temperature standards on the same basis is consistent and scientifically justified.

The rise above ambient criteria is not based on any scientifically-supported effects on aquatic populations that are adequately documented in the scientific literature. As stated in the report prepared for TCEQ by Texas Tech University,¹ the rise above ambient criteria are primarily based on a 1968 report (Green Book) prepared for the predecessor of the U.S. Environmental Protection Agency (EPA). However, the Green Book does not include scientific data that support either the concept or the recommended criteria. The 2015 Texas Tech report is unhelpful with respect to the scientific basis for the rise above ambient criteria — it only summarizes the criteria used by other states (a few of which do not have such criteria), which shows that this type of criterion is used by many states. This is no surprise because EPA adopted these criteria in its water quality criteria documents and encouraged states to adopt them. T/K continues to recommend that TCEQ revisit the scientific basis for the rise above ambient criteria and consider eliminating them from the water quality standards if they cannot be justified.

It is clear that the original literature citations on the rise above ambient criteria do not address the same type of adverse temperature effects on aquatic species as the numeric criteria are designed to protect against. The numeric criteria are based on incipient sub-lethal effects to a range of aquatic species indigenous to Texas (e.g., critical thermal maximum).² The Green Book recommended applying the rise above ambient criteria to monthly means of maximum daily temperatures recorded at specific

¹ Maul, J. (July 2015) *Final Report for Texas Temperature and Dissolved Oxygen Criteria Development Support Project*, The Institute of Environmental and Human Health, Texas Tech University, Lubbock. Note: only fresh water species were evaluated in this study.

² National Technical Advisory Committee on Water Quality Criteria (April 1968) *Water Quality Criteria*, Federal Water Pollution Control Administration, Department of the Interior, Washington, D.C., pp. 32-33; 35-36; 69-70. (Green Book)

³ Maul, J., op cit., pp.11-12.

locations to protect the “well-being and production” of aquatic species⁴ with no reference to lethal and/or sub-lethal endpoints. The recommendation that the rise above temperature criteria should be applied as monthly means of maximum daily temperatures clearly establishes that the concept applies to a longer averaging period than the numeric criteria. The Green Book recommendation supports establishment of an allowable mixing zone size for the rise above ambient criteria that represents a larger area in the receiving water than the numeric criteria, which is consistent with the technical basis currently used by TCEQ for application of the human health criteria for toxic pollutants. In other words, if sub-lethal effect requires longer exposure for one endpoint than for another, the application of those endpoints should be consistent with the exposure period assumptions.

The rise above ambient criteria should apply to an area larger than the mixing zone required to achieve the numeric temperature standard to be consistent with the bases of the two forms of the temperature standard. T/K recommends that the rise above ambient criteria be applied using the default human health mixing zones that also apply to long-term adverse effects. Specifically, Equations 1 and 3 in the simple heat balance method should use the default chronic aquatic life mixing zone definitions and Equations 2 and 4 should use the default human health mixing zone definitions.

Simplified Uncalibrated Numerical Modeling

T/K has used this methodology for a number of clients to perform the required thermal plume characterization studies that TCEQ has required in TPDES permits issued to plants that have thermal discharges. We support the methodology as described.

T/K has always developed site-specific ambient receiving water temperatures (and salinities for salt water) for thermal plume characterization studies by using TCEQ’s Surface Water Quality Monitoring (SWQM) database. Our experience with the SWQM database is that it will be usable for most, if not all, of the thermal plume modeling that may be required by TCEQ.

Detailed Site-Specific Analysis

T/K supports the methodology and requirements specified in the draft IP.

Thermal Mixing Zones and Industrial Cooling Water Areas

As stated previously in these comments, T/K believes that default thermal mixing zones should be applied consistent with the effects endpoints and exposure bases for the two types of temperature standard:

1. Numeric temperature criteria should be applied using the chronic aquatic life mixing zones defined for toxic pollutants; and

⁴ Ibid., pp. 32-33; 35-36; 69-70.

2. Rise above ambient temperature criteria should be applied using the human health mixing zones defined for toxic pollutants.

T/K also supports that site-specific thermal mixing zone development is not limited to the default mixing zone size, but will be authorized on a site-specific basis that assures protection of all reasonable uses as specified at 30 TAC 307.8(b)(10).

Water Bodies with Temperature Impairment

T/K supports this provision of the draft IP, although we are unaware of any surface water bodies that are currently on the Texas Section 303(d) list.

PERMIT APPLICATION

The draft IP and proposed new page for the industrial permit application forms are unclear as to the timing and scope of information that must be submitted to support site-specific thermal mixing zone analysis as provided for by the Simplified Uncalibrated Modelling and/or Detailed Site-Specific Analysis provisions in the draft IP. Both of these provisions of the draft IP recommend contacting the TCEQ before performing any work on the supporting information required. However, it is unclear whether TCEQ intends that this work be performed so that it can be submitted with a renewal/amendment permit application or whether a compliance schedule will be included in the permit to allow submittal of this information.

T/K recommends that TCEQ allow either approach for supplying the required information:

1. Allow applicants to supply the information required for the modeling or detailed site-specific approaches with a permit application. Again, with emphasis on working with TCEQ staff before preparing the information.
2. Allow permittees to supply the information with an application to amend the TPDES permit during a three-year compliance period⁵ if the thermal mixing zones developed using the simplified heat balance are too restrictive. This approach is consistent with the TCEQ policies for site-specific metals limits (e.g., water effect ratio development).

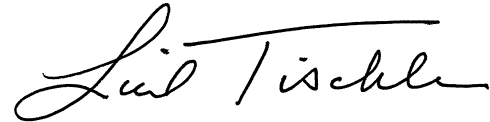
T/K appreciates the opportunity to provide these comments on the draft IP language and permit application page for thermal discharges. If you have any questions regarding these comments, please let us know. Our email addresses are dianna@tkee.com and lial@tkee.com.

Sincerely,

⁵ T/K assumes that because the thermal mixing zones will be establishing a water quality-based effluent limit, the three-year compliance schedule authorized for such limits will also apply to temperature limits.



Dianna Kocurek, P.E., B.C.E.E.
Partner



Lial Tischler, P.E., Ph.D., B.C.E.E.
Partner