Message

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Sent: 12/4/2019 3:41:06 PM
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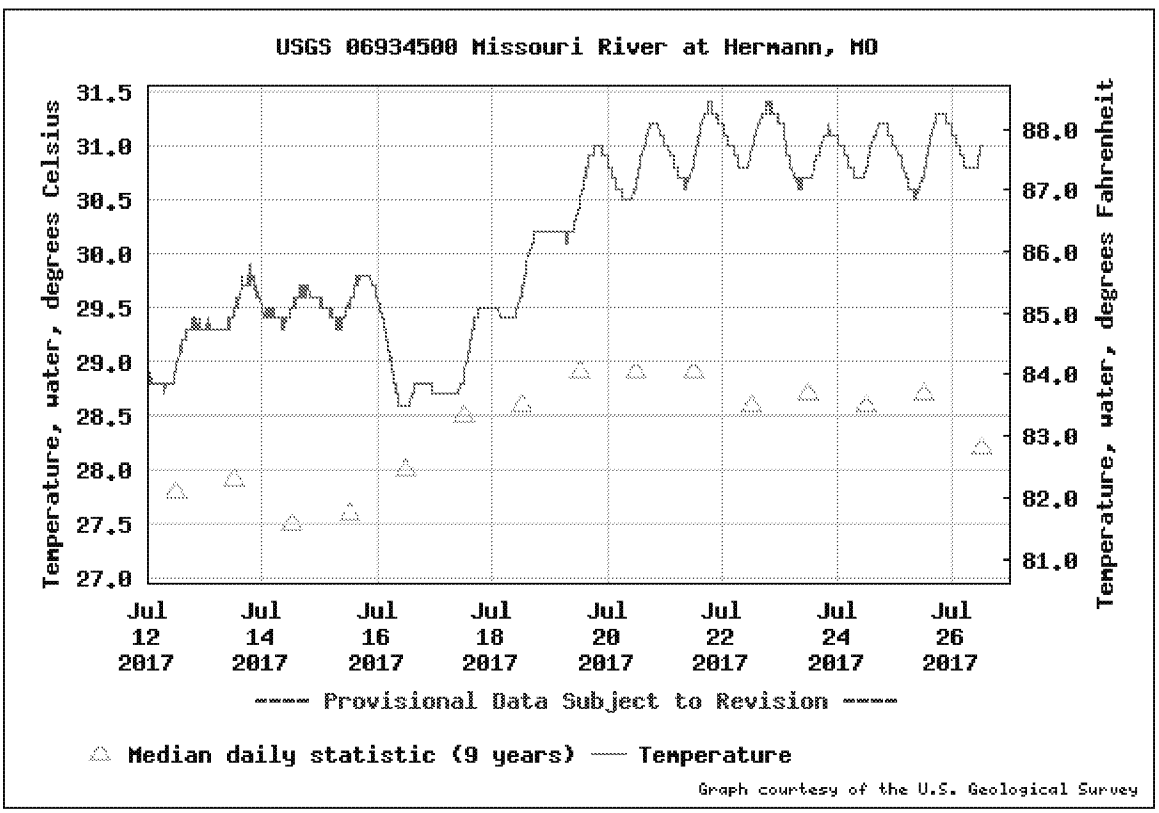
Subject: Comments on Ameren Labadie 316(a) Variance Request
Attachments: VM_comments Labadie 316(a) Determination-Final1.pdf

EPA has two sets of comments on the proposed variance. Comments on the Biological Study are attached, and NPDES permit based comments are below:

The current permit and the Ameren variance request have calculated a "Delta T" of +5°F at edge of the Regulatory Mixing Zone (RMZ) for ¼ cross section of river. The current permit limit is expressed as a Thermal Discharge Parameter (TDP) derived by modeling. The limit of 0.95 TDP, defining a 5°F temperature increase with a 5% safety factor, is technically correct, but does not provide transparent information to the lay public. Permit limits and the variance request should be based on temperatures expressed as degrees °F as set in MDNR criteria.

Equations for deriving TDP are calculated to many significant digits but monitoring in the current permit is only required once daily. During heat events, stream temperature can vary by up to 1.5°F in a given day. See 2017 data in the graph below.



The permit should assure that monitoring precision matches up with the detailed nature of the modeling. It should be noted that the USGS gage at Hermann, the data source for the permit, monitors Flow and Temperature every 15 minutes. Temperature can be measured inexpensively by calibrated thermistors feeding data to a computer that calculates TDP and estimated temperature at the edge of the RMZ. Continuous monitoring at this frequency would generate unneeded data, but high frequency monitoring when variance conditions are approached could create important data sets for future consideration. In any case, all data used in the model equations should be time synchronized.

Ameren has requested a temperature variance for up to 6% of days each year. In keeping with the precision of the model and the ability to collect data, the time of the variance should be measured in the unit of hours. The MDNR criteria for increased temperature in the Mississippi river are based on a percentage of time in the calendar year and would allow this unit of measure. This would avoid the judgement call of how to count fractional days when river temperatures are rapidly changing. Other states, such as Iowa, use this approach.

Is the calculation for the 40% Mixing Zone the same as for 25% Mixing Zone as defined in Note 5 in the current permit? Would cold temperature/low water events change this calculation?:

Note 5: Mixing Zone (As Percent of Total River Flow) shall be calculated using the following equation:

Mixing Zone = [0.1857 ln (M1 / M2) + 0.234] * 100

The MO Water Quality Criteria for the Missouri River do not allow for any exceedence of temperatures above 90 degrees F instream: 10 CSR20-7.020(4)(D)(1). Criteria for lower sections of the Mississippi River, 10 CSR20-7.020(4)(D)(5), also require a 90 degrees F maximum, but do allow for a 5% time of exceedence and a maximum exceedence temperature of an additional 3 degrees F (93 degrees F at the edge of the RMZ). Mixing zones are set for both rivers at 25% at 10 CSR20-7.020(4)(D)(6).

The Ameren variance request appears to be based on the logic of the Mississippi River criteria and this seems appropriate. The questions/comments below are based on that approach.

While variable with river temperature, what is the more elevated temperature (>5°F) at the edge of the 25% mixing zone when the RMZ is expanded to 40% of the river? Does this equate to an additional 3°F increase above 90°F? Is the 40% value based on a calculated zone of passage or a maximum temperature at the higher RMZ? Ameren's variance request should define the increase in temperature above 90°F when the larger RMZ is allowed.

Ameren requests that the size of the RMZ be increased when river flows are less than 40,000 CFS. Based in 62 years of USGS data, the 25%-tile of flow at the Hermann gage is 39,200 CFS. Ameren has requested a 6% time of exceedence. It is not clear to EPA why the 40,000 CFS flow was chosen as a cut-off when this is a fairly common condition.

How would MDNR assess compliance with the variance-based limit? If limits and the variance are based on the Mississippi River model, there are other examples of permit approaches in other states.

EPA suggests annual reports with electronic spreadsheets providing the raw data and calculations of TDP and temperature at the edge of the RMZ when the variance is utilized. These detailed data sets could be of long-term use as the variance is renewed over future permit cycles.

Thanks for the opportunity to comment.

--JD