GULF RESTORATION NETWORK
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RE: Comments from Gulf Restoration Network on Draft TMDL Total Nitrogen and Total Phosphorous for the Pearl River, Ross Barnett Reservoir to the Strong River.

Dear Greg:

MDEQ decided that for the present Pearl River nutrient TMDL, it would choose chlorophyll "A" as its response variable rather than dissolved oxygen. The agency states that the Pearl River is a eutrophic system (at least at certain times of the year) and that dissolved oxygen (D.O.) is not as good a response variable as chlorophyll "A" in a eutrophic system. Dissolved oxygen in a eutrophic system, under conditions of low flow and high summer temperatures (the growing season for phytoplankton) can reach supersaturation. Oxygen supersaturation is known in the context of highly nutrient enriched waters such as sewage lagoons or commercial catfish ponds and is considered a water quality problem when it happens regularly. In a river, when physical conditions begin to approximate those of an over-fertilized lake or lagoon system, it is indeed a bad sign. The Pearl apparently does reach this state in dry months, during low discharge with high summer air and water temperatures. An obvious sign of eutrophication would be a fish kill, although the discussions in the draft TMDL do not report fish kills on the river. There is anecdotal evidence of fish kills on the Pearl in the last dozen years.

MDEQ also asserts that the Pearl is a phosphorous limited system. It seems to follow that if the agency uses chlorophyll "A" as a response variable, it is appropriate to write the TMDL that seeks primarily to control levels of phosphorous pollution in the river. The assertion that phosphorous is a better target than nitrogen is not backed up very strongly with citations to literature, and there is no empirical evidence using the phytoplankton from the Pearl or other algae studies to corroborate this assertion. The lesser attention given to the nitrogen side of the nutrient problem in the Pearl leads the reader of the TMDL to think that maybe as long as some reductions in phosphorous can occur, what happens to the nitrogen pollution levels is less important. MDEQ is insinuating that perhaps nitrogen levels can be left alone as long as the phosphorous is reduced. Nitrogen, if it is present in high levels, is still a problem. More explanation is needed on this.
The model that MDEQ relies on for this TMDL is apparently one that was developed by Tetra Tech for the Georgia Pacific Corporation for its Monticello paper mill which

discharges to the Pearl. The model was calibrated to existing water quality sampling data from years 2008-2012, collected by MDEQ, EPA, and the Georgia-Pacific Monticello paper mill.

The complaints that Gulf Restoration Network had last time MDEQ released a draft nutrient TMDL for the Pearl in 2011 were centered on the relative scarcity of sampling data used to develop the document. This time around, there is more data cited. The additional data has been used to calibrate a model that MDEQ then runs to answer various TMDL questions. In Tetra Tech's report on their Pearl River Nutrient Model, there is one section of the discussion that seems to be supported by more data than any other. Georgia Pacific's own data collection of dissolved oxygen as shown in Appendix A Figure 77 has more data points over a longer number of years than most of the other plots or graphs. It is to be trusted more than shorter sampling periods with fewer data points, thus when the Tetra Tech writer makes assertions based on this more robust data, they can be considered relatively reliable.

In Appendix "A" section 5.2; the writer reports the results of a couple of runs of the nutrient model on two parameters: dissolved oxygen and chlorophyll A. Model runs were conducted with and without the discharge from the Monticello paper mill. In these runs of the model, water quality upstream and downstream of the Monticello discharge point were compared under the "with discharge" and "without discharge" conditions. It is stated on Appendix "A" page 7 that "The downstream summer Chl a with the GP Monticello discharge were about 5ug/l or 10% higher with the existing GP Monticello discharge than with no discharge" but "The downstream DO levels with the GP Monticello discharge had fewer days that were above the DO saturation levels".

Another way of saying this is: with the GP mill discharge turned on in the model, there were fewer days of supersaturated dissolved oxygen conditions and 10% higher levels of Chl A downstream of the pipe. Downstream of the GP's effluent outfall the model runs say that Chlorophyll A , MDEQ's chosen response variable for this TMDL, isn't related to oxygen supersaturation as strongly as MDEQ asserts in the TMDL. This calls into question the rationale of choosing Chlorophyll A as a response variable (DEQ says this is because it explains eutrophic supersaturation better than plain D.O.)

It is not known whether this result is statistically significant, and the model effect of being downstream of the GP effluent isn't discussed. However these summary statements of model behavior are made where the longest running and strongest sampling data set exists for dissolved oxygen in any of the presented studies that are relied on in the creation and calibration of this model – near the GP paper mill. On its face, and without more explanation, this section contradicts MDEQ's choice of Chl a as a response variable for the TMDL.

The Georgia Pacific Tetra-Tech model was used to develop the total phosphorous and total nitrogen reduction scenarios. A total phosphorous reduction of 70% was chosen because it would limit chlorophyll a to less than 60 ug/l. This is based on the decision that the Pearl is a phosphorous limited system. This decision, as discussed above, is not well documented.

This reduction would, according to the model, limit the flux of dissolved oxygen to 3.5 mg/l. This was based on the "limiting cell" in the model, which was a sampling cell or region found at Hopewell, Mississippi where the diurnal swings of dissolved oxygen were the greatest of any encountered during sampling. This cell at Hopewell could be said to show the worst effects of eutrophication in the sampled sections of the Pearl River. It is well downstream of the urban section of the Pearl and is well upstream of the confluence of the Strong River with the Pearl. No discussion of the Hopewell cell (other than the high D.O. flux) is provided that may clarify or further explain its selection as the critical cell in the model or why it merits being selected as a keystone for building the model and the TMDL. Before embarking on calculating loads (Wasteload and Load) and allocating reductions among the loads, the TMDL in section 3.4 makes the assertion, based on different runs of the model, that even if all the point source loading in the river was removed, the Pearl would still be substantially impaired by only the non-point source loads. This assertion is important because final recommendations on using Best Management Practices to reduce non-point source pollution seem to mirror it and reinforce it. This use of the model seems to be an easy way to reach the same conclusion that was reached in 2011 which was to rely on non-point source reductions via the use of Best Management Practices (BMPs) to get the vast majority of the nutrient reductions in the TMDL. GRN complained about this in its 2011 comments.

Here, a model that Georgia Pacific ordered from Tetra Tech for the paper company's own purposes (study the Monticello paper mill) is appropriated and run by MDEQ to assert that non-point source discharges are the real problem and that no matter what is done to reduce point sources, it won't change the picture for nutrient pollution on the Pearl River. Flip Wilson, the 1970's era comedian, depicted a female character, Geraldine, who used to say: "The devil made me do it." Here MDEQ can hide behind the model and assert that "The model told us we can ignore point source reductions on the Pearl River", or "The model made us do it." Without more proof, found in other sources than just the model runs that are offered, I don't fully buy MDEQ's assertion. I'd like to see and hear more about this.

Gulf Restoration Network's Comments to the 2011 Draft Pearl Nutrient TMDL by Lisa Jordan of Tulane Environmental Law Clinic, went further than this. She cited the EPA Guidance for Water Based Decisions: The TMDL Process, EPA 1991 at Chapter 2 page 8. She wrote "MDEQ's approach in relying wholly or partially on nonpoint source reductions to achieve the TMDL is directly contradictory to EPA guidance on this issue. Lisa wrote that EPA has recognized the inescapable fact that "the only federally enforceable controls are those for point sources through the NPDES permitting process." The practical limitations of non-point source controls are many. They are often voluntary, funding sources to build them are limited, and they often cannot provide reasonable assurance that nonpoint source reductions can be achieved.

Using flow data and targeting a 70% reduction in TP, the TMDL total phosphorous wasteload for the Pearl River is set at 4208 lbs/ day. This is said to be a reduction of 58.1%. When this TP wasteload is allocated among five POTWs and to a lumped-together group of *de minimus* facilities, it is not stated whether these are reductions for the facilities. Are they reductions? For instance, is the new "growing season" wasteload of 1131.7 lbs/day for the

Savanna Street Plant in Jackson a reduction for that source? How will this wasteload be written into the Savanna Street POTW permit? Does it only work for May-October? Is the wasteload allocation, 400 lbs./day for storm water a reduction from the current allocation? If the MDEQ can prove that the Pearl is indeed a phosphorous limited system, and that only total phosphorous needs to be reduced, then it needs to assure the public and this commenter that the wasteload allocations for TP are reductions rather than something else.

The allocations of Total Nitrogen are performed in a more general way, dividing the 75,733 lbs. among all the point sources to give each one 11.5 lbs./day. These are probably not wasteload reductions, since the focus is on Total Phosphorous. Best Management Practices are relied on to reduce TN. As Lisa Jordan wrote in GRN's 2011 comments, and as was quoted above, there seems to be no reasonable assurance that reductions in total nitrogen will be achieved through only the use of Best Management Practices.

Alternatively if MDEQ seeks to rely on Best Management Practices to reduce nutrients in the load allocation portion of the TMDL equation, it should describe current BMPs implemented in the Pearl River Basin that are affecting the segment of the river under consideration. It should give latitude and longitudes, photos and explanations of practices on the ground now in the various counties. It should also list the BMP projects that are currently on the funding priority list for the 319 grant program, and give a report of what the Mississippi Forestry Commission, Mississippi Soil and Water Conservation Commission, and MDOT are doing to control polluted runoff from all sites in the basin under their care and jurisdiction. The reader of the TMDL needs a sense of the size of the nonpoint source problem (whether for N or P) and the full variety of Best Management Practices that could be used, and at what scale they might be effective.

I have served on 319 Watershed Implementation teams for DEQ in my time at MDWFP and know first-hand that these projects cover a tiny portion of the non-point source pollution problems in a basin. Furthermore, they are often pilot projects meant to inspire and instruct others on how to implement similar practices to accomplish similar goals. Pages 42 and 43 list the agencies that can implement BMPs, but as a way to reduce nonpoint source pollution in the Pearl Basin in the study area of the draft TMDL, these pages are not a serious attempt at explaining how BMPs could possibly help.

MDEQ has the GIS mapping and engineering resources to do a better job of explaining the kinds and numbers of BMPs that might be necessary in both the urban and rural settings in the Pearl Basin. MDEQ has a list of 319 projects that have been built in the counties under consideration in this section of the Pearl. Compared with the information **that could be conveyed** about BMPs for reduction nonpoint source pollution, the listings and discussions on pages 42 and 43 are trivial and not to be taken seriously by anybody. I don't think the people who prepared the TMDL believe the BMP discussions are anything more than boilerplate language.

In conclusion, MDEQ's Pearl Nutrient TMDL is based on somewhat more data than the last draft that was published and then withdrawn by MDEQ. It looks like MDEQ got lucky this

time and found a new model that someone else conceived and funded. The model calibration seems to have been done on several data sets derived from actual sampling, but some have very few days of sampling. The match or fit between the modeled and measured parameters was fair except when the data from the GP Monticello mill was used. The match was better here. The GP data had more sampling days and was more robust and is probably more trustworthy than the data derived from shorter sampling trips by MDEQ or MDEQ and EPA. The choice of the Hopewell sampling cell needs more explanation. The assertion that the Pearl is a phosphorous limited system needs to be better backed with authority, or a literature survey of similar river systems, or proof by laboratory testing with water and phytoplankton from the Pearl, via microcosm or mesocosm experiments. The strange (and contradictory to the choice of Chl a as a response variable) model-derived relationship between days of supersaturation and chlorophyll "A" below the GP Monticello Mill given in the Appendix needs explanation with relation to MDEQ's choice of Chl A as a response variable.

Nevertheless, after all the modeling, and the new choice to solve nutrient problems in the Pearl in what is described as a phosphorous limited system, the end result of the TMDL is not that different from the last draft that drew criticism from Gulf Restoration Network. We disputed the way the wasteloads and loads area allocated, and more particularly, the reliance on nutrient reductions that are derived from nonpoint source pollution through the use of BMPs. It is not consistent with EPA guidance to lay off so much of the problem on nutrient reductions that must be made with the application of Best Management Practices. Are the waste load allocations of P to the various point sources including Savanna Street POTW actual reductions for these facilities? This is important to know.

The fact that the upper part of the drainage area for the TMDL study area includes Jackson, Mississippi is important. Jackson is a massive source of nonpoint source pollution, and as such holds almost infinite possibilities for the application of BMPs that might control nutrients. Jackson also has a broken sewage collection system that produces enormous numbers of bypasses of sewage straight into the Pearl River or tributaries each year. The bypasses of manhole covers, mostly due to pipe overcharge during rain events, means that untreated sewage that should find its way to the river **via a point source** is actually finding its way to the Pearl by surface drainage systems **as nonpoint source pollution**. Manholes along the interceptor pipes leak along every one of the urban creeks and ditches that feed the Pearl River. Jackson has a huge nonpoint source runoff problem just from the sewage system. MDEQ and the City may fix this problem in stages over the next 25 years, but for the cycle of years covered by this TMDL, the problem will remain significant and mostly unabated. This sewage nonpoint source problem is separate from the traditional urban nonpoint source pollution problems that affect the urban section of the river and the 10 creeks or ditches that join the river in the Jackson reach.

If MDEQ wants to rely so heavily on BMPs for the reduction of nonpoint source pollution in this TMDL, then it can at least make a credible stab at outlining the extent of the nonpoint source problem that the Pearl faces, starting with what runs off the streets of Jackson, Ms. Considering the magnitude of this problem, the statement that MDEQ makes about

nonpoint source pollution being the main problem for the Pearl could have veracity even without the model being manipulated to say it.

A detailed analysis of the BMPs needed to reduce nonpoint source pollution in this drainage would set this TMDL document apart from the many other TMDLs that treat the subject as rote boilerplate language. If this is a serious document, then do a serious job in this section.

I include Lisa Jordan's TELC/GRN comments from 2011 by reference and append them to these comments.

I request a meeting with MDEQ staff to discuss these comments in an informal setting at MDEQ in Jackson at a time before the TMDL is presented to the Commission or elsewhere for agency approval.

Thank you for the opportunity to provide comments.

Sincerely,

Andrew Whitehurst
Water Policy Director
Gulf Restoration Network