

BMW pH TMDL and Implementation Plan Approach

The Implementation Planning Group (Steve Lundt, Amy Woodis, Jim Dorsch, Barbara Biggs, Laurie Rink, Dennis Stowe, Terry Baus, Blair Corning, Sarah Reeves) met to develop an approach to an implementation plan for the draft pH TMDL for Barr Lake and Milton Reservoir. The Group recognized that there are a number of uncertainties that remain after completion of the modeling, including:

- The pH target is uncertain. There are no data from the lake systems to determine what the shape of the curve looks like as phosphorus values decrease. It is uncertain whether high alkalinity will buffer the system and keep the pH higher than currently assumed.
- The relationship between pH and phosphorus is uncertain.
- The role of internal load is uncertain. It is not clear that removal of wasteload will bring the waterbodies into attainment of the pH standard.

The USEPA August 2, 2006 memorandum entitled “Clarification Regarding “Phased” Total Maximum Daily Loads” (Memo) defines Phased TMDLs as those where “available data only allow for ‘estimates’ of necessary load reductions or for ‘non-traditional problems’ where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty.’ The uncertainty identified above led the group to conclude that a Phase TMDL would be appropriate for the BMW TMDL. The Memo provides an example of such uncertainty as: “there is little information regarding the loading capacity of a complex system such as an estuary and it is difficult to predict how the a [sic] water body will react to the planned load reductions.’ This is similar to the BMW situation, where there are no data for the waterbodies that allow prediction of pH at lower levels of nutrients and chlorophyll.

The Group also considered the Implementation Plan and how it should be structured. According to the Memo, Adaptive Implementation is “an iterative implementation process that makes progress toward achieving water quality goals while using any new data and information to reduce uncertainty and adjust implementation activities.” The Memo also notes that Phased TMDLs are an example of the adaptive implementation approach. It only follows that the Phase TMDL would work well with an Adaptive Implementation Plan. An Adaptive Implementation Plan allows for monitoring of implemented progress to understand the effectiveness of a given action. This is useful when the actual effectiveness of phosphorus load reduction activities or other identified efforts to reduce pH excursions is uncertain.

Thus, based on the information provided in the Memo and the complexity and uncertainties associated with the BMW pH TMDL, the Group suggests that the BMW consider developing a Phase TMDL with an Adaptive Implementation Plan.

Following are some initial thoughts about how the TMDL might be phased and the studies/questions that would be answered to minimize uncertainty.

PHASE I (Through 2014)

Studies

Evaluation of BNR at POTWs

Use Attainability Analysis (better define the uses)/Site-Specific Standard studies and information collection

Additional Temporary Modification studies needed by Division to resolve uncertainty

Phase I – Unknowns/Questions That Need To Be Answered

- Can we express TMDL in pH rather than Phosphorus?
- What is happening when we see pH low at pumps and high when the water hits Barr (or vice versa)?
- What is background?
- Is it feasible to move from hypereutrophic to mesotrophic? How about just eutrophic?
- What is role of nitrogen in the system?
- What happens once nutrient removal begins at POTWs?
- What happens once nutrient removal begins at limit of technology for the WWTPs?
- How much Phosphorus can we remove from stormwater?
- What is role of internal load in the lake?
- What should breakout be for the Wasteload?
- What impact will state warm water lake nutrient standards have on the TMDL?
- What roll does alkalinity play in Barr and Milton Reservoirs?
- Investigate in-canal treatment.
- Limnocorrals to test changes in water quality/treatment.
- Will pumps be turned back on? What impact will this have long-term? May need to alter TMDL based on the outcome.
- Rapid infiltration basins for treatment.
- Stormwater BMPs for nutrient removal.

PHASE II

Use data from studies to develop Site-Specific Standard that includes feasibility and use this to revise TMDL.

Updated TMDL date: December 2020. Date was chosen because South Platte Triennial Review is June 2020 and will need to make any changes in Regulation 38 associated with results from Site-Specific Standard development and/or UAA work.

IMPLEMENTATION PLAN

Detailed plan about how we are going to answer all the questions in Phase I and how it will be adaptive.