M E M O R A N D U M

Date: May 5, 2011

To: *Barr-Milton Watershed Board of Directors*

From: *Bear Creek Watershed Association*

Re: **BMW pH/ DO TMDL**

The BMW pH/DO TMDL documents as modified by the Water Quality Control Division and posted for public comment were reviewed by the Bear Creek Watershed Association at the May 11, 2011 Board meeting. The Association noted Division edits in the draft version. The Bear Creek Watershed Association by unanimous vote supported the following statement:

> *The Association is concerned about the addition of the Dissolved Oxygen TMDL without a reasonable timeframe to fully under the implications and how this significant change to the December 2010 BMW pH TMDL documents might affect future nutrient releases from Bear Creek Reservoir. The Association remains concerned that the pH/DO TMDL could require nutrient reductions over ambient conditions at the Bear Creek Watershed Association (BCWA) Site 45 (Reservoir Discharge) in the future. The Association Board notes there is no language in the draft BMW pH/DO TMDL that recognizes the Bear Creek Control Regulation as controlling for nutrient releases from the reservoir. Further, there is no assurance within the Draft BMW pH/DO TMDL that the Bear Creek Control Regulation maybe recommended at the next Triennial review for lowered Total Phosphorus targets as a direct result of the BMW pH/DO TMDL. As shown by the load estimates in this Memorandum, the Association "point Source" is incompliance with the expectation for the Draft BMW pH/DO TMDL. Otherwise, the BCWA has no objections to the BMW pH/DO TMDL as drafted by the WQCD.*

The Bear Creek Watershed remains within the defined "data" shed for the BMW pH/DO TMDL. Discharge from Bear Creek Reservoir is identified as a "point" source and input to the BMW pH/DO TMDL and model. As such, our BCWA site 45 is identified as a source that contributes about 1.8 % of the external load of Total Phosphorus (See Table 1). The BMW pH/DO TMDL defines the contribution of Total Phosphorus from Bear Creek for both Barr Lake and Milton Reservoir at 1,167 kg/year or 2,672.7 pounds/year. In the period from 2000 through 2010, the average Total Phosphorus at BCWA site 45 was 2,030 pound/year.

The only problematic year was 2007, based on the flow predictions at the downstream Sheridan gage (Table 2 and Figure 1). Although I believe the actual flow at site 45 was less than measured at Sheridan, the total load would still exceed the target of 2,672.7 pound/year. The Total Phosphorus load target at BCWA site 45 was met in 9 out of 11 years of reviewed data. The target Total Phosphorus listed in the draft BMW pH/DO TMDL can be met under the current BCWA management program. The BMW pH/DO TMDL expects any reduction in this target Total Phosphorus load will occur by in-canal treatment in the Barr-Milton Watershed prior to discharge into those waterbodies.

Since nitrogen may become a future issue, the Association estimated the nitrate loading at BCWA site 45 from 2000-2010. Figure 2 and Table 2 shows the Nitrate-Nitrogen loading at BCWA site 45. The Association has developed and will maintain a spreadsheet for BCWA site 45 that contains water quality data and nutrient loading estimates. Beginning in 2010, the Association began collecting Total Nitrogen data at BCWA site 45. The Association also installed a stream staff gage at the weir above site 45, which allows the Association to make better estimates of the flow at the monitoring station.

Table 1 Model Prediction Compared with BCWA Data

Source	Average Conc. (ug/l)	Total TP TMAL Load		Barr Load		% of Total Load	Milton		% of Total Load
		Kg/yr	Pounds/ Year	Kg/yr	Pounds/ Year		Kg/yr	Pounds/ Year	
Barr-Milton TMDL Model Bear Creek	32-80	1,167	2,672.7	1,091	2,505.2	1.60%	76	167.5	0.20%
BCWA Bear Creek Site 45 from 2000-2010	36.9 (10-63)	920.8	2,030 (average)						

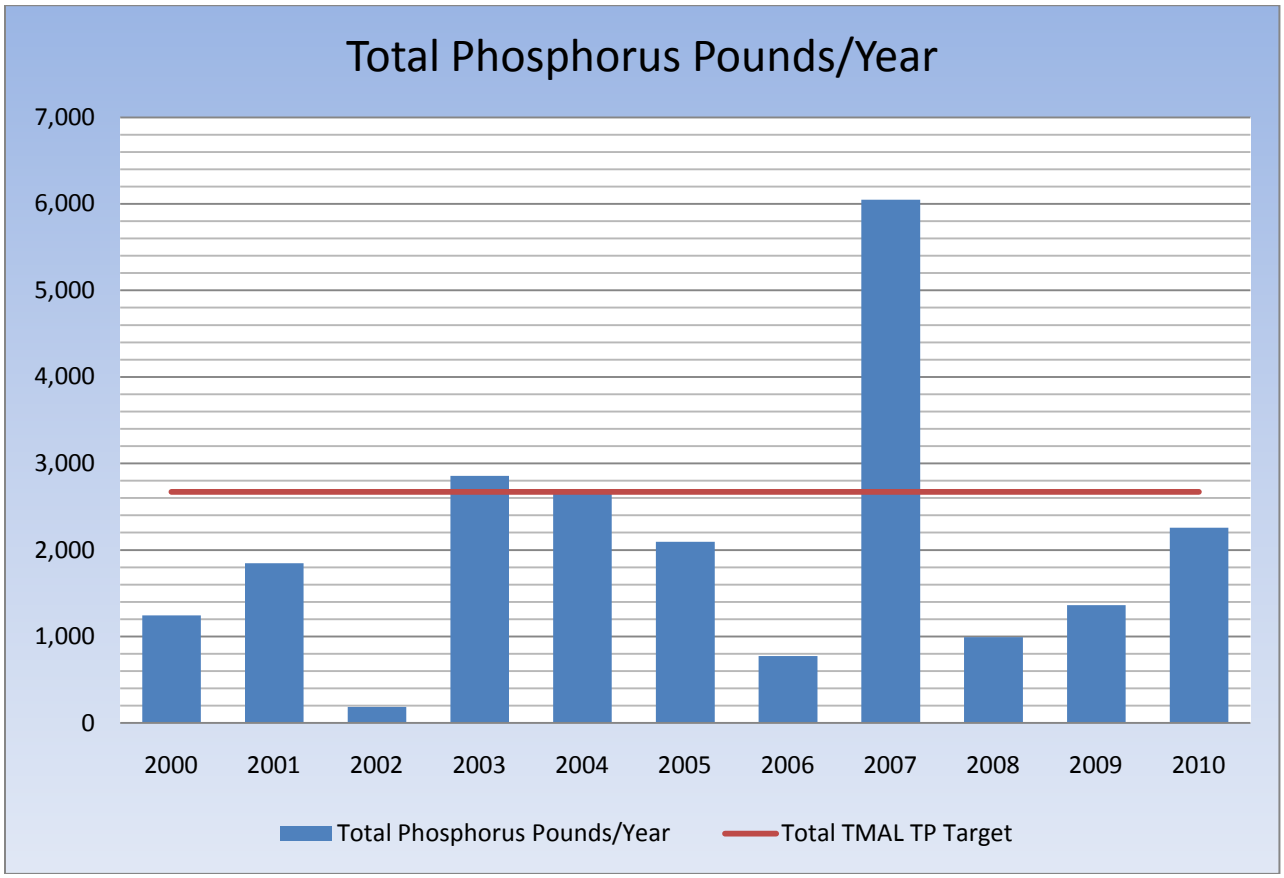

Figure 1 Total Phosphorus Load Estimate at BCWA Site 45

Table 2 Load Estimates at BCWA Site 45

	Total Phosphorus Pounds/Year	Nitrate-Nitrogen Pounds/Year	Flow (ac-ft/ yr)
2000	1243	23,146	15,113
2001	1847	17,736	15,906
2002	187	3,182	2,317
2003	2856	2,856	21,215
2004	2667	3,569	33,706
2005	2094	22,936	31,605
2006	776	6,837	11,748
2007	6047	57,496	67,725
2008	991	16,470	20,307
2009	1361	18,576	21,503
2010	2259	32,148	29,462
Average	2030	18,632	

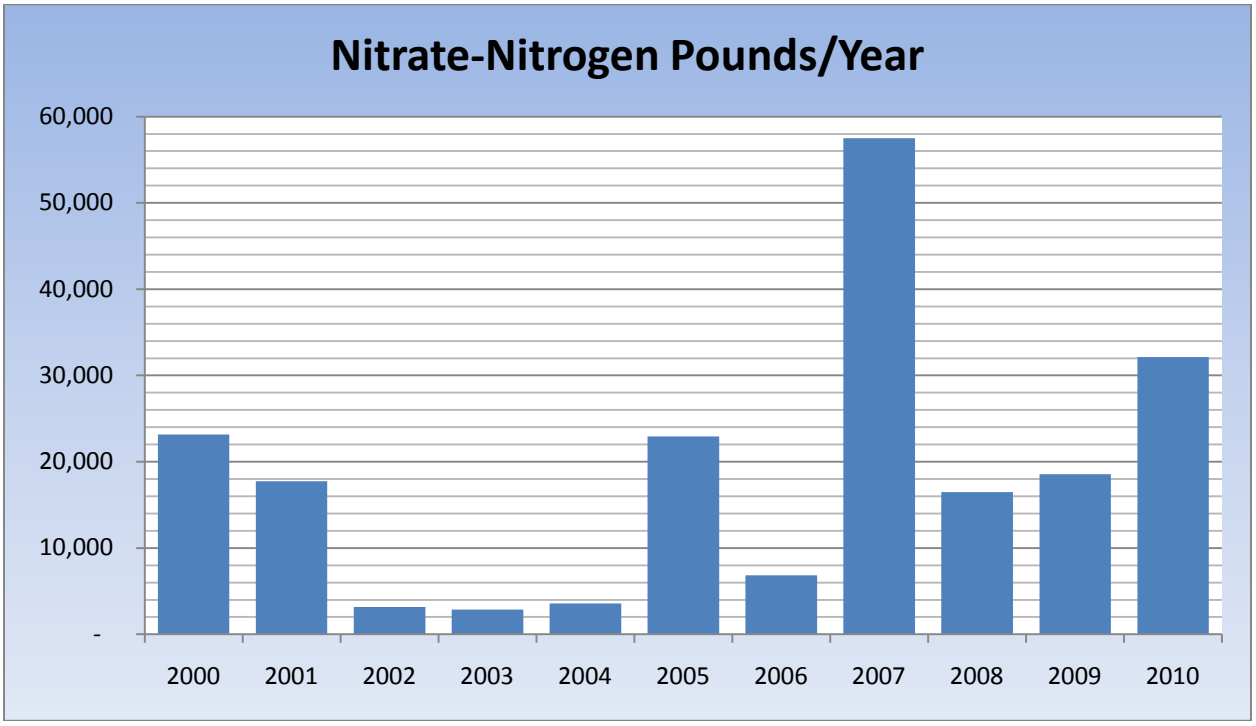

Figure 2 Nitrate-Nitrogen loading at BCWA site 45