

**BEFORE THE COLORADO WATER QUALITY CONTROL COMMISSION**  
**Department of Public Health and Environment, State of Colorado**

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**REBUTTAL STATEMENT OF THE BEAR CREEK WATERSHED ASSOCIATION**

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**IN THE MATTER OF THE RULEMAKING HEARING FOR CONSIDERATION OF THE ADOPTION OF REVISED WATER QUALITY CLASSIFICATIONS, STANDARDS AND DESIGNATIONS FOR MULTIPLE SEGMENTS IN THE CLASSIFICATIONS AND NUMERIC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN, REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN, REGULATION #38 (5 CCR 1002-38).**

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The Bear Creek Watershed Association (hereinafter “Association”) presents its Rebuttal Statement in the above referenced matter. The BCWA is responsible for watershed management, restoration and implementation within the context of a management agency and the Bear Creek Control Regulation (Control Regulation 74, 5 CCR 1002-74). The Association provides summary positions in the form of this rebuttal statement on the proposed changes to Regulation #38 as directly related to the Bear Creek Watershed in the Bear Creek Basin.

**BCWA Summary Positions for WQCD proposed standards changes for segments 1a, 1b, 1c, 1e, 2, 3, 4a, 5, 6a, 6b, 7, 8, 9, 10, 11, and 12 in the Bear Creek Watershed.**

- WQCD Exhibit 38-1 Rationales. The Association has agreed to work with the Water Quality Control Division (WQCD) staff to correct the Regulation 38 Rationales for the Bear Creek Watershed after this hearing process.
- New Metal Standards. The Association is supportive of the WQCD metal changes as proposed for segments in the Bear Creek Watershed.
- Temporary Modification for Arsenic (ch). The Association has no concern with the proposed chronic arsenic temporary modification. EPA noted that for Bear Creek Segment 11, an arsenic temporary modification is proposed but Exhibit 38-1 notes that “there are no currently identified permitted point sources that discharge to this segment.” The Association confirms there are no permitted dischargers or future planned dischargers into segment 11 within the Bear Creek Watershed portion of Segment 11, and the Association is not aware of any dischargers to this segment from the Bear Creek Reservoir to the South Platte River. As such, the Association would support the EPA position to have the WQCD withdraw the proposal for this segment.
- Chlorophyll a and Phosphorus Stream Standards for Selected Segments. The Association is generally supportive of the chlorophyll a standards proposed to protect the recreation use and the phosphorus standards proposed to protect the Aquatic Life use for specific stream segments. The Association data record indicates that stream segments should meet the proposed phosphorus limit and having this standard on segments 1a, 3, 5, 6a, 7, 8, and 9 is reasonable, with the concern about Segment 7 as noted below. The Aspen Park Metropolitan District (COSPBE06a) is permitted to discharge into Turkey Creek Segment 6a and is listed in section 38.5(4) Nutrients, WQCD Exhibit 1. According to footnote C (*Footnote C: Total phosphorus (TP) and chlorophyll a standards only apply above the facilities listed at 38.5(4).*), the phosphorus and chlorophyll standards will only apply above this discharge. There is only 0.35 miles of stream/wetlands above this discharge point

(Figure 1). Generally, there is no surface flow in this small segment, rather subsurface flow through wetlands. While the Association is not opposed to applying the new standards to this small portion of Segment 6a, they serve little purpose.



**Figure 1 Segment 6a above APMD discharge, the discharge from the pond is the beginning of Segment 6a. The pond is Segment 12.**

- Segment 7 Wetland Fens. Segment 7 is the Mainstem of Bear Creek and all tributaries to Bear Creek, including wetlands, within the Mt. Evans Wilderness Area, and includes the extensive Fen complex below Summit Lake. The Fen complex, which is over 2 square miles in area, contains numerous Fen ponds as seen in Figure 2. The proposed standards change for Segment 7 includes adding Chla=150 mg/m<sup>2</sup> and P=110ug/l (tot), which would also apply to the wetland fen complex. The Association water quality data from this Fen complex is finding the nutrient content and chlorophyll productivity is higher than expected and can exceed the proposed phosphorus standard, and presumably the chlorophyll a limit. In the Association 2014 monitoring program, several natural Fen ponds that had no notable anthropogenic influences had total phosphorus concentrations ranging from 45-660 ug/l. These Fen ponds consistently exhibit high algal productivity (Figure2).



**Figure 2 Typical Summit Lake Fen pond with high algal productivity and total phosphorus= 165 ug/l**

As such, the Association is concerned about having the proposed chlorophyll and phosphorus standards apply to this “wetland” portion of Segment 7. The Association recommends adding a qualifier to the Regulation 38 table that excludes wetlands (Fen complex) for the new chlorophyll and phosphorus standards for Segment 7. The Association is working to better understand the complex chemistry of these Fens and plans to make a recommendation in the future, specific to Fen water quality.

- Direct Use Water Supply for Evergreen Lake. The Association supports the “Direct Use Water Supply Lakes and Reservoirs Sub-classification”. The Association is monitoring Evergreen Lake and the data shows it can support a DUWS classification.
- Bear Creek Reservoir Chlorophyll and Total Phosphorus Standards, and Temporary Modification. Although the Association continues to have some concerns about the WQCD Exhibit 38-3, the Association will support the proposed standards and recommend adoption of:
  - 1) BCR nutrient standards
    - a. Chlorophyll a = 12.2 ug/L
    - b. Total phosphorus = 22.2 ug/L
    - c. Assessed as a summer average concentration at BCWA site 40 (deepest part of reservoir) based on at least three samples representative of the mixed layer in the summer growing season
    - d. Allow one exceedance in five years on average for either standard
  - 2) Adopt temporary modifications for both standards
    - a. Basis: uncertainty about the underlying standards
    - b. Set expiration for 2020
- Adopt Temporary Modifications For Both Standards. A new reservoir load allocation and subsequent TMDL based on the proposed phosphorus standard of 22.2 ug/l should result in the wastewater dischargers getting new wasteload allocations (WLA) that will be much lower than the existing wasteload allocations. The new WLAs will have significant impacts on the dischargers and may require costly system upgrades to comply with the WLAs. A preliminary estimate by the Association suggests future wastewater treatment plant upgrades necessary to meet expected lower total phosphorus effluent limits could exceed 5 million dollars. As such, the Association strongly believes that it is imperative to have temporary modifications included in Regulation 38 for both standards as proposed by the WQCD to address the uncertainty about the underlying standards. The temporary modification provides the necessary time for the Association to better implement more aggressive or active management solutions to address the total phosphorus loading in Bear Creek Reservoir as noted in the WQCD Exhibit 38-3. Better understanding of the internal total phosphorus loading problem will subsequently effect the establishment of a new TMDL. The Association believes an aggressive management program for the reservoir could reduce the internal loading of total phosphorus and consequently alter external loading management strategies. Even addressing the internal total phosphorus loading problem will still require a new TMDL for the watershed with new WLA for the point source dischargers.
- Phosphorus Standard and Reduced Future Point Source Wasteload Allocations. EPA in their prehearing statement asked – “*is it possible that a TMDL would result in requirements for point sources to reduce TP loads?*” The Association contends that the new phosphorus standard will have a significant impact on discharges to reduce TP loads and/or effluent limits. The

Association anticipates new significantly lower wasteload allocations and probably lower total phosphorus effluent limits for point source dischargers.

The proposed total phosphorus standard of 22.2 ug/l will get translated into an annual total phosphorus load allocation for Bear Creek Reservoir, which will be part of a future total maximum daily load (TMDL). Based on the previous work by the Association and the WQCD, the proposed TP standard can be translated into a flow based TP annual load of approximately 2,865 pounds (at 28,900 acre-feet/ year). The current wasteload allocation (WLA) for permitted dischargers is 5,255 pounds per year. So clearly the WLA will need to be reduced significantly to fit within the total annual allocation to the reservoir. The WQCD Exhibit 38-3 Bear Creek Reservoir Site-Specific Standards shows that total phosphorus from onsite wastewater systems (OWTS) is potentially twice of the total phosphorus discharged by point sources. There is also measured nonpoint source total phosphorus reaching the reservoir.

The future TMDL should be  $TMDL = PS\ WLA + NPS + OWTS + Margin\ of\ safety$ . The Association analysis of the total phosphorus data record indicates that only about 20-35% of this total phosphorus load from permitted dischargers actually reaches the Bear Creek Reservoir. Watershed data from the last four years indicate the annual nonpoint phosphorus base-flow load from all sources in the watershed ranges from 5,000 to 6,000 pounds, annually. A single major flood event in the watershed can generate 1,000 to 12,000 pounds of total phosphorus. Clearly, only a fraction of this load transports to the Bear Creek Reservoir on an annual basis. Much of the total phosphorus from NPS remains immobilized in the watershed, but can be transported to the reservoir under flood conditions. On average over 15 years of data record, only about 28% of the potential nonpoint source total phosphorus reached Bear Creek Reservoir. Some of the nonpoint source load reduction can be attributed to improved Jefferson and Clear Creek county management practices for road maintenance, construction practices, stormwater controls and land use controls. The NPS total phosphorus component reaching the reservoir can range from 25-98% of the reservoir load (Table 1), depending on annual flow conditions. On average, about 73% of the annual total phosphorus load reaching the reservoir can be attributed to NPS.

**Table 1 Estimated NPS Total Phosphorus Contributions to Bear Creek Reservoir**

Total Phosphorus lbs/yr					
	Discharge WWTF	Assume 25% PS	Reservoir Total	Reservoir NPS	%NPS
2000	3,637	909	1,216	307	25%
2001	2,638	660	1,542	883	57%
2002	2,722	680	442	-238	
2003	4,498	1,125	1,687	562	33%
2004	1,716	429	2,318	1,889	81%
2005	1,994	498	2,795	2,297	82%
2006	1,545	386	1,016	630	62%
2007	1,872	468	6,357	5,889	93%
2008	1,243	311	1,658	1,347	81%
2009	1,252	313	2,375	2,062	87%
2010	1,121	280	3,654	3,374	92%
2011	909	227	847	620	73%
2012	972	243	634	391	62%
2013	1,138	285	16,006	15,721	98%
2014	1,076	269	4,010	3,741	93%
Median		472	3,104	2,632	<b>81%</b>
Average					<b>73%</b>

Translating the reservoir total phosphorus standard into an annual reservoir Load Allocation (LA) will presumably be flow-based as previous work by the WQCD and the Association recommended.

The TMDL process will be very complex and there is significant uncertainty on how the TMDL will be allocated, if the reservoir will respond to watershed load reductions, and if reduced WLA will be effective. Based on the Association understanding of the various total phosphorus contribution types and transport mechanisms, the future PS total phosphorus allocation could be reduced from 5,255 pounds per year to as low as 760 pounds per year, but probably no greater than 1,100 pounds per year. Since discharge permits don't function well with variable total phosphorus limits that are flow-based, the future WLA will need to be fixed for each discharger. This will result in a flow-based NPS target for the reservoir (Table 2). There is uncertainty on how to best manage for these variable NPS and OWTS targets. In the mean time, the Association has established policies and programs directed at reducing external nutrient loading in the watershed attributable to OWTS and NPS.

**Table 2 Flow-based Total Phosphorus targets for Bear Creek Reservoir based on proposed phosphorus standard**

Standard is Flow Based			
Flow ac-ft/yr	Reservoir Standard at 22.2 ug/l		
	TP LA Pounds	Possible PS WLA	NPS+OWTS+MOS
5,000	495	760	-265
10,000	991	760	231
15,000	1,486	760	726
20,000	1,982	760	1,222
25,000	2,477	760	1,717
28,891	2,863	760	2,103
30,000	2,973	760	2,213
35,000	3,468	760	2,708
40,000	3,964	760	3,204
50,000	4,955	760	4,195
	$y=10.091x$		

- Bear Creek Reservoir Temperature and Stratification. In 2014, the maximum normal pool depth was 38 feet, with an average depth of 28 feet in the central pool area. The multi-purpose pool is usually about 110-surface-acres and has a storage capacity of 2,000 acre-feet. The reservoir depth in the Turkey Creek and Bear Creek arms of the reservoir was substantially reduced by the flooding in September 2013. The average depth is about 10 feet. The reservoir is located in a high wind corridor and winds in excess of 30 mph are common. The reservoir is frequently subjected to wind mixing. The assumption that the de-stratification of the reservoir is an artifact of the aeration system isn't necessarily correct. The aeration system only targets a portion of the central pool and about 60% of the reservoir is not affected by the aeration system. The Association has shown many times that the reservoir waters mix naturally during extended periods of no aeration. The Association still contends that the concept of allowing stratification to occur so that the colder temperatures in the hypolimnion could slow recycling of phosphorus is less likely to be a useful management practice because of constant natural mixing and shallow depths of the reservoir.
- Bear Creek Reservoir Aeration System. The Association has determined through ongoing monitoring that the destratifying aeration system in Bear Creek Reservoir is a necessary and long-

term or permanent management practice necessary to protect the quality reservoir fishery and prevent Dissolved Oxygen standard exceedances during summer months of June 1-September 30. Reservoir aeration has also proved to be a necessary management tool in low flow conditions. The WQCD Exhibit 38-3 suggests that allowing the reservoir to stratify by not using the aeration system is a reasonable management strategy to reduce internal phosphorus loading and could be beneficial to reservoir management. The primary purpose of the aeration system is to protect the fishery and the Association would be concerned if the aeration management practice is not allowed or limited.

**CERTIFICATE OF SERVICE**

I hereby certify that on May 12, 2015 the original and 13 true and correct copies of the Rebuttal Statement for Bear Creek Watershed Association was hand delivered to the Colorado Department of Public Health and Environment, Water Quality Control Commission.

I do hereby certify that a copy of the Bear Creek Watershed Association Rebuttal Statement in the matter of the rulemaking hearing for consideration of the adoption of revised Water Quality Classifications, Standards And Designations For Multiple Segments in the Classifications and Numeric Standards For South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin, Regulation #38 (5 CCR 1002-38) was electronically transmitted to the WQCC and parties to the RMH.

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