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MEMORANDUM

To: Water Quality Control Commission
Paul Frohardt, Administrator, WQCC

FROM: Jim Saunders and Kathleen Reilly, WQCD

RE: Briefing for the 2007 TRIH on Control Regulation #73 for Chatfield Reservoir

DATE: June 26, 2007

This memorandum is prepared to brief the Water Quality Control Commission (Commission) on the topics that the Water Quality Control Division (Division) has identified as pertinent for the triennial review information hearing on the Chatfield Reservoir Control Regulation #73, (5 CCR 1002-73) scheduled for July 9, 2007. The memo includes background information and the Division's rationale to support holding a triennial rulemaking hearing on Regulation #73 in 2008.

**Background:**

The Chatfield Reservoir Control Regulation (#73) was adopted by the Commission in 1989 in response to concerns about the potential for eutrophication in the reservoir. The regulation was based on implementing phosphorus controls that would meet the in-lake phosphorus standard of 0.027 mg/l through the growing season (July – September). The intent of the phosphorus standard was to ensure that chlorophyll concentration (a measure of algal abundance) did not exceed 0.017 mg/l, the goal for maintaining beneficial uses for the reservoir.

The phosphorus load in the reservoir is load and flow-dependent and based on 59,000 lbs/yr. at a flow of 261,000 acre feet/year. Point source contributions are limited to 7,533 lbs./yr.; non-point source are allocated 52,291 lbs./yr. Section 73.3 (b) of the regulation specifies the formula for the Total Maximum Annual Load (TMAL) of total phosphorus for the reservoir.

A basin-wide group, which became the Chatfield Watershed Authority (Authority), conducts a water quality monitoring program to measure the annual phosphorus loading to the reservoir and to assess phosphorus and chlorophyll levels in the reservoir. The results of the monitoring effort are reported to

the Commission each year. In addition to the reservoir, the Chatfield watershed includes the Plum Creek basin and that portion of the South Platte River basin from Strontia Springs Reservoir to the Chatfield Reservoir, as well as smaller drainages in close proximity to the reservoir. The upper South Platte basin (above Strontia Springs Reservoir) is handled separately in terms of allocation and implementation. The attached Figure 1 is a current map of the Chatfield Watershed

The control regulation outlines requirements for monitoring and reporting in Section 73.5. An annual report on the Chatfield Basin is to be submitted to the Commission to update the information about water quality and to track progress in implementing the regulation. The information required in the annual report is described in detail in sections 73.5.2 and 73.5.3.

The control regulation also provided for a basin-wide control plan for non-point phosphorus sources, which were to examine the potential for trading point and non-point sources of phosphorus. In 1993, the Commission adopted language which allows for phosphorus credits and trading between point source dischargers and allows point source credits if non-point source reductions are demonstrated. This triggered significant activity on the part of county and municipal governments to reduce phosphorus loading to the reservoir.

In 2005, in preparation for the triennial review, the Chatfield Authority, in cooperation with the Division and the Coalition for the Upper South Platte (CUSP) contracted to have a review done of non-point source load assumptions contained in the control regulation (Stednick Report). The intent of the review was to determine the validity of nonpoint source load assumptions used to allocate total phosphorus as defined in the control regulation, and in the Total Maximum Annual Load (TMAL). Among the principal observations and recommendations of the report were the deficiencies of the models used to develop the TMAL, leading to the recommendation that the Authority re-examine the models within the next 5 years and, if appropriate, revise the models using their long-term data set.

In 2006, the Division and the Chatfield Watershed Authority worked together to finalize the trading guidelines for phosphorus exchanges affecting point and non-point sources.

Section 73.5 of Regulation #73 calls for submittal of the Chatfield Authority's Annual Report by May 15th. The Division uses the information contained in the report to determine compliance with the regulation, and to evaluate changes and trends. The report was not received for use in this triennial review information hearing.

**Division Evaluation of Control Reg. #73:**

The Division believes there are several compelling reasons to consider changes to the Chatfield Reservoir Control Regulation in a triennial rulemaking hearing. These are summarized below.

1.) The phosphorus standard has been exceeded in 5 of the last 6 years, while the chlorophyll goal has not. The incongruity suggests that the linkage between chlorophyll and phosphorus, which is a critical underpinning of the TMAL, should be revisited. Chlorophyll is especially relevant insofar as the Division intends to emphasize chlorophyll in the development of nutrient criteria for lakes in the 2010 Basic Standards revisions.
2.) Greater clarity is needed in describing the protocol for computing the average phosphorus concentration, which determines attainment of the phosphorus standard. The evolution of

sampling protocols has inadvertently created a bias in the average phosphorus concentration, making it inconsistent with the original intent.

3.) A rulemaking hearing would provide an opportunity to revisit the basis for the TMAL and to address one of the recommendations in the Stednick report concerning the update of modeling provisions.

4.) The phosphorus load estimation procedures, which play a key role in determining the TMAL, need to be re-evaluated. Recently, a similar effort was undertaken successfully in Cherry Creek Reservoir, and the Division would like to employ consistent procedures to improve the basis for the TMAL in Chatfield Reservoir.

**Division's Proposed Changes to Control Regulation #73**

The Division proposes the following changes to the Chatfield Reservoir Control Regulation, found principally in Section 73.3.1.

1. Revise the technical basis for linking chlorophyll and phosphorus concentration in Chatfield Reservoir.
2. Determine the phosphorus concentration consistent with the chlorophyll goal.
3. Clarify the procedure used to determine attainment of the phosphorus standard.
4. Update the TMAL formula to reflect the water budget for the reservoir and the phosphorus concentrations associated with each inflow as is being done for Cherry Creek Reservoir. This update would aim for consistency of application among the reservoirs for which control regulations have been developed (Cherry Creek, Bear Creek, Dillon and Chatfield).

**Recommended Commission Actions:**

Based on the issues that the Division has identified for consideration, the Division recommends that the Commission consider scheduling a triennial rulemaking hearing on Regulation #73 the Chatfield Reservoir Control Regulation. The Division further recommends that the Commission consider concurrent changes to regulation #38 for Chatfield Reservoir (Segment 6b of the Upper South Platte) regarding the adoption of a chlorophyll standard, or to revise the phosphorus standard.

The value of opening regulation #38 is that it provides a timely opportunity to synchronize the TMAL, which is defined in the Control Regulation, with the standard, which appears in Regulation #38.

The interdependence of the TMAL, which may change as a result of the proposed review, and the standard, argues for simultaneous rather than sequential consideration as a matter of efficiency and effectiveness.