



## MEMORANDUM

July 5, 2018

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**TO: BOARD OF DIRECTORS**  
**ANDY MUELLER, GENERAL MANAGER**  
**PETER FLEMING, GENERAL COUNSEL**  
**JOHN CURRIER, CHIEF ENGINEER**

**FROM: MIKE EYTEL, SENIOR WATER RESOURCE SPECIALIST** *ME*

**SUBJECT: GRAND LAKE CLARITY ADAPTIVE MANAGEMENT UPDATE**

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*This memo is provided as an update for discussion. No Board action is requested.*

**STRATEGIC INITIATIVE(S): 3B, 3C, 3D, 5C, 7A, 7D, 8C, 8D, 9A, 10**

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The River District is a party to the Grand Lake Clarity MOU along with Grand County, NWCOG, Northern Colorado Water Conservancy District, and the Bureau of Reclamation (BOR). The primary purpose of this MOU is to establish an adaptive management process while Reclamation conducts a planning and NEPA process to evaluate alternatives to improve Grand Lake Clarity. This MOU, along with the revisions to the Grand Lake Clarity standard, guide the adaptive management process.

Studies have shown there are multiple factors, excessive nutrients, inorganic particulates, and runoff all contribute to degraded water quality and clarity in Grand Lake. Notwithstanding all the contributing factors, the operation of the Colorado Big Thompson Project (C-BT) introduces these factors into Grand Lake which absent C-BT operations would not be present. A wide range of options are being considered to address Grand Lake clarity, ranging from simple operational changes/timing of deliveries to piping diversions to Adams Tunnel, essentially bypassing Grand Lake with any pumped C-BT Project water.

The Grand Lake Clarity MOU formed an Adaptive Management Committee which was tasked with meeting weekly July 1 - September 10, and outlines the monitoring protocols for Grand Lake in support of the narrative water quality standard. Monitoring for Grand Lake clarity is done through Secchi measurements.<sup>1</sup> The clarity goal for in Grand Lake, as established by the MOU is an average Secchi depth of 3.8 meters and a minimum Secchi depth of 2.5 meters.

For this year C-BT operations will attempt to limit diversions through the Alva B. Adams Tunnel to 220 cfs on weekend's and 440 cfs on weekdays from July 1– September 10 and monitor Grand

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<sup>1</sup> The Secchi disk, as created in 1865 by Angelo Secchi, is a plain white, circular disk 30 cm (12 in) in diameter used to measure water transparency or turbidity in bodies of water. The disc is mounted on a pole or line, and lowered slowly down in the water. The depth at which the disk is no longer visible is taken as a measure of the transparency of the water.

Lake Clarity Secchi depths. As it turns out this year has shaped up to be drier than modelled, so the BOR is not confident in being able to fulfill project water demands without additional pumping from Lake Granby in the near future. At the time of writing this memo, the BOR was hoping to be able to collect one set of Secchi readings on July 2 before turning on the Farr Pumps. The struggle between pumping demands and protecting clarity at Grand Lake is a key example of the conflict between the competing directives governing operation of the C-BT Project that the Clarity MOU seeks to avoid.

While the adaptive management process has rarely gone as planned due to ever changing hydrology, the collection of operational water quality data continues and actively informs the process as the NEPA Alternatives are evaluated.