Mojave Basin Area Watermaster Appendix B Transition Zone Water Supply Update

Prepared by: Wagner & Bonsignore, Engineers Robert C. Wagner, PE Watermaster Engineer February 28, 2024



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MEMORANDUM

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To: Mojave Basin Area Watermaster

From: Robert C. Wagner, P.E.

Date: February 28, 2024

Re: Transition Zone Water Balance

This memorandum describes the purpose of the Transition Zone (TZ) as envisioned by the Judgment and presents the method for calculating outflow to the Centro Subarea from the Alto Subarea. We include water level hydrographs to demonstrate the basic assumption that water levels within the TZ are relatively stable over time (see Fig. 2 and 3). Also presented is the pumping history of the TZ demonstrating reduced pumping demand since the early 1950's with significant reductions during the past 30 years (see Fig. 4).

The TZ is the area generally lying between the Lower Narrows, Mojave River, and the Helendale Fault (see Fig 1). Department of Water Resources Bulletin 84, 1967 was a foundational technical document guiding development of the Judgment. The Alto Subarea was drawn to be consistent with the Upper Mojave Subunit identified in Bulletin 84 (Bull., 84, fig. 2, page 7). As a result, the boundary between Alto and Centro, was placed at the Helendale Fault, where limited stream gaging data existed at the time the Judgment was drafted. The TZ was considered to pass storms from Alto to Centro, without interference from pumping within the TZ. It was assumed that the consumptive use within the TZ could be reasonably determined on annual basis.

The pumping history in the TZ is shown on Fig. 4 and shows the decline in pumping since the early 1950's. The decline in pumping as well as the decline in consumptive use has contributed to the water level stability in the TZ, demonstrated by the water levels within the TZ. Also, contributing to the stability is the discharge of treated effluent from the Victor Valley Wastewater Reclamation Authority. Water pumped and used by producers contributing to sewers, upstream of Lower Narrows, is conveyed, treated and discharged in the TZ. The discharges are part of the basin water supply, contribute to downstream subareas and support riparian habitat.

To calculate outflow from the TZ to Centro, the following elements of water supply use and disposal with the TZ are included: Elements of Inflow generally include : a) measured flow at Lower Narrows, b) VVWRA discharge c) subsurface inflow, d) ungaged inflow

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Elements of Outflow: generally, include e) subsurface outflow, f) consumptive use of production, g) phreatophyte water use, h) change in storage. For purposes of this analysis we assume, based on water levels, that change in storage over time is negligible or zero. Then by summing the elements of inflow and outflow, we calculate the outflow at Helendale Fault as supply to Centro. The calculation is shown Appendix A.

There is a makeup water obligation calculated on an annual basis that Alto owes to Centro. The obligation is to be satisfied every year, but is not part of the calculation of average annual outflow to Centro, as reported herein; however, it does contribute to the Centro water supply (see Watermaster Annual Reports, Figure 3-10, Tables 4-2, 4-3).





FIGURE 2



FIGURE 3-7





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FIGURE 4

