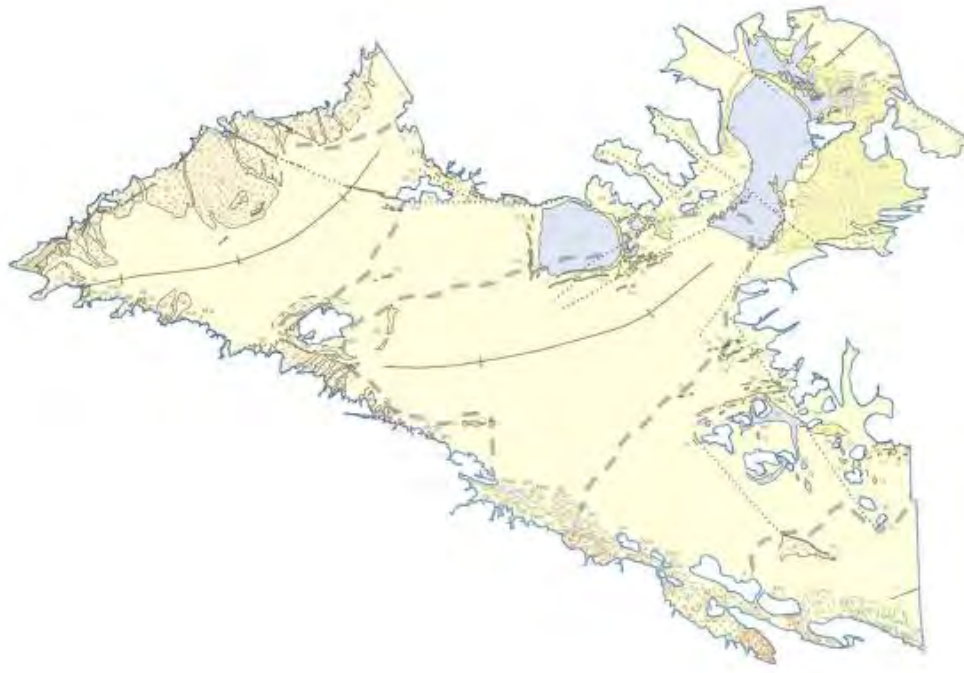


EXHIBIT A

Summary Expert Report

Phase 3 – Basin Yield and Overdraft

Antelope Valley Area of Adjudication



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historical rural residential water requirements are considered to be that constant fraction of the historical M&I water requirements of the major purveyors. As such, the rural residential water requirement in 2009 is estimated to be about 7,000 af.

In order to estimate the annual total water use of the mutual and private water companies for years 1946 through 2009, their per capita water use rate was estimated based on limited available population data and reported water use for 16 of the companies (1992 through 1995, the most recent years available; USGS, 1995 and 2003). The resultant unit rate of water use, 0.40 afy per capita, was then utilized to calculate annual total water use for all water companies for those years when population figures were available (2001, 2004, 2005, and 2006; California Department of Health Services). The total calculated water requirements were then compared to the total recorded water requirements of the major water purveyors for those four years in order to develop a ratio of water use between the mutual and private companies and major purveyors (5 percent). That percentage was then applied to the annual total recorded water requirements of the major purveyors for the remaining years in order to complete the estimation of annual total water requirements of the water companies for the period 1946 through the 2009. Appendix D-4: Table 1 shows the individual calculations made to develop the estimated per capita water use for the water companies, and the resultant estimates are included in Table D.3-3.

In summary, the total M&I water requirements in the Valley, including those recorded by the main purveyors and estimated for the water companies and rural residential users, was as high as about 122,000 af in 2007 and is currently about 98,000 afy.

Historical M&I Return Flows

Historical M&I return flows have originated from two sources: 1) on-property, including from landscape irrigation and other outdoor water use around all homes, and from the discharge of water to on-site disposal systems of unsewered homes and 2) off-property, specifically from infiltration of recycled water at water reclamation plants (WRPs) serving sewerred homes and other municipal service connections. Regarding return flows from irrigation/outdoor water use, and as part of this investigation, it was estimated that the percentages of indoor and outdoor water use in the Valley are 45 and 55 percent, respectively, based on interpretation of the variations in monthly municipal water requirements for LACWWD40 (data available for 2001 forward). Further, it was assumed that the percentages of irrigation water consumptively used vs. generating return flows are 80 and 20 percent, respectively, which are considered to reasonably meet irrigation requirements without generating excessive runoff or deep percolation. Thus, of the 55 percent of total municipal-type water requirements (urban, mutual and small water company, and rural residential) utilized outdoors, 20 percent would become return flow. This equates to 11 percent of the total M&I water requirements becoming return flow from M&I irrigation.

In the case of return flows from on-site disposal systems such as septic tanks and leach fields, it was estimated that the percentages of sewered and unsewered homes in the Valley's urban areas are approximately 70 and 30 percent, respectively. These were based on comparison of WRP influent volumes and urban area water requirements, as well as the spatial overlap of developed service areas of the municipal and sanitation districts (district information available for 2000, 2005, and 2008). As above, an estimated 45 percent of total municipal water requirements would be utilized indoors and 100 percent of water disposed on-site would produce return flows. Thus, 30 percent of the urban municipal water requirements (26.5 percent of the total M&I water requirements) plus 100 percent of the mutual/small water company and rural residential water requirements (4.4 and 7.1 percent of the total M&I water requirements, respectively), or a combined 38 percent of the total M&I water requirements, were estimated to be utilized in unsewered areas in the Valley. Of this amount, 45 percent would be discharged on-site and become return flow, which equates to approximately 17.1 percent of the total M&I water requirements. The percentages of total M&I water requirements for irrigation/outdoor water use (11 percent) and on-site disposal systems (17.1 percent) were uniformly utilized to estimate the historical on-property M&I return flows, which are listed in Appendix D-6: Table 1 and shown in graphical form in Appendix D-6: Figure 1.

The off-property return flows were derived from an assessment made of the deep percolation of recycled water from the Lancaster and Palmdale WRP ponds, storage reservoirs, and land application areas, as described in Section 4.6 and Appendix G of this overall report. Annual return flow volumes were estimated from 1975 (Lancaster) and 1953 (Palmdale) through 2009, as shown in Tables 4.6-1 and 4.6-2, respectively, in Section 4.6 of this report. In addition, M&I return flows from the on- and off-property sources are compiled in Appendix D-6: Table 1 and shown in Appendix D-6: Figure 1.

As with agricultural return flows, the M&I irrigation return flows infiltrate within the year the water is utilized, but do not reach sufficient depth to actually recharge groundwater until years later. In contrast, M&I return flows from the on-site disposal systems as well as the WRPs have been ongoing and are considered to provide recharge to groundwater as they become available (no delay). As a result, while both on- and off-property M&I return flows are referred to as "Gross Return Flows" in Appendix D-6: Table 1 and Figure 1, those from the on-site disposal systems and WRPs are considered to be net flows in the corresponding analysis of water resources and natural recharge in the Antelope Valley described in this overall report (Chapter 4.3 and Appendix E).

Review of the M&I return flow tables and graph shows that return flows from the M&I service areas and rural residential parcels (on-property sources) have comprised all or the great majority of the total flows and, as expected, have paralleled the historical increase in M&I water requirements in the Valley. These return flows were typically less than 3,000 afy in the 1950s, increasing to about 10,000 afy during the 1970s, steadily increasing to a high of about 32,000 af in 2007 before slightly declining to roughly 28,000 af by 2009. In contrast, return flows from the

WRPs have been much smaller, essentially limited to less than 200 afy from the time of the WRPs' construction until the 1980s, at which point increasing effluent volumes from the Palmdale WRP were disposed by land application at the adjacent LAWA property, reaching around 7,000 afy by 2000. Subsequently, land application was replaced by agricultural irrigation and reduced to about 3,000 afy by 2005 and less than 500 afy currently. The overall effect of these diverse trends has been to produce historically increasing amounts of return flows until recently, to a total of nearly 40,000 afy in 2001, followed by a gradual decline, to about 28,000 afy currently.

D.3.4 Environmental and Open Space Water Requirements

The current contracted water requirements for the Paiute Ponds wetlands, including the impoundments for duck hunting, are reported to be about 3,300 afy; the current contracted water requirements for the Apollo Lakes impoundments are approximately 170 afy (LACSD14, May 2004, and IUWMP, 2005). Records of water deliveries dating back to 1975 indicate that the actual deliveries to the Paiute Ponds have grown from roughly 1,000 afy in 1975 to as much as 9,700 af in 2005 and are currently 6,700 afy (Table D.3-4). Recycled water deliveries have exceeded the contracted amount of 3,300 afy since 1993. The actual water deliveries to the Apollo Lakes impoundments have ranged between 100 and 300 afy with an average of around 190 afy since 1975, which is in general agreement with the contracted amount of 170 afy.

It is unclear whether Paiute Ponds and Apollo Lakes represent an actual "demand" in the classical sense of water requirements for uses such as agricultural irrigation and municipal water supply, or whether they represent forms of water disposal, specifically of treated water (recycled water) that have produced environmental features now requiring water to maintain the resultant environment. Based on available documents (ESA, May 2004, and IUWMP, 2005) it appears that the latter would be an appropriate classification and that there is truly a "water requirement" to maintain the environmental features at Paiute Ponds and Apollo Lakes.

Regarding return flows from these environmental features, they have historically been derived solely from infiltration of recycled water from the Paiute Ponds. As described in Section 4.6 and Appendix G of this overall summary report, these flows are estimated to be consistently small, on the order of 20 afy, due to the presence of thick clay layers extending beneath the ponds from the adjacent Rosamond Dry Lake (CH2MHill, 2006; GTC, 2006). Since the return flows from the Paiute Ponds have been ongoing for decades, they are considered to provide recharge to groundwater as they are generated (no delay) and thus treated as net flows in the corresponding water resources and natural recharge analysis (Appendix E).

D.3.5 Summary of Historical Water Requirements

In summary, historical agricultural water requirements for 1920 to 2009 were determined by compiling previously reported estimates for the period 1920 to 1950 and estimating the water