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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