5.18 WATER RESOURCES

5.18.1 INTRODUCTION

Purpose

The County of Los Angeles Department of Regional Planning (DRP) Environmental Checklist Form, which has been prepared pursuant to the California Environmental Quality Act (CEQA), requires that water resources issues be evaluated as part of the environmental documentation process. The impacts of the proposed development on the Project site are analyzed at a project-level of detail; direct and indirect impacts are addressed for each threshold criterion for both the on-site and off-site Project features. Growth-inducing impacts and cumulative impacts are described in Sections 6.0 and 7.0, respectively.

This section analyzes the water resources available to support the Project and the impacts associated with providing adequate water supplies for the proposed development. The analysis in this section complies with the provisions of Sections 10910 et seq. of the *California Water Code* (Senate Bill [SB] 610) for assessing water supplies for CEQA purposes. The analysis is presented for Years 1 through 20 of the Project from first occupancy in Year 1 through buildout in Year 20. The analysis also extends to Year 25 (i.e., 5 years after buildout) when return flow water supplies from use within the Antelope Valley groundwater basin will mature for Project use.

Summary

Implementation of the Project would result in a maximum of 19,333 housing units, the creation of an estimated 23,675 permanent jobs, and a maximum resident population of approximately 57,150 persons at buildout. As discussed in detail below, at buildout the Project is estimated to require 11,365 acre-feet per year (afy) of water for residential, commercial, landscaping and other purposes, of which 6,788 afy would be treated for potable use, and 4,577 afy would consist of recycled water treated in on-site wastewater treatment facilities to State standards under Title 22 of the *California Code of Regulation* (CCR) for unrestricted reuse.

The Project's potable and recycled water infrastructure, including potable and recycled water treatment, delivery, metering and monitoring, will be managed by a water district or public utility district (PUD) that will serve the Project (the "Project Water Purveyor"). The on-site water system shall comply with the federal and California Safe Drinking Water Acts and related regulations and recycled water will be treated to *California Code of Regulations* Title 22 unrestricted reuse standards. To ensure that projected demand levels are achieved, water demand will be minimized through the use of low-flow indoor fixtures; irrigation equipment with electronic sensors; water-wise landscaping; water budget based water rates consistent with well-established rate structures used by water districts in California; full metering of all water use; and monitoring, enforcement, and response measures as required. The Project will also maximize opportunities for groundwater recharge and groundwater banking. Wastewater generated by indoor use will be treated to State unrestricted reuse standards and recycled for non-potable outdoor irrigation uses and for wastewater and cooling purposes in the proposed Business Park. The Project's per capita water demand will be lower than comparable water use rates in existing Antelope Valley developed areas that were not built to current water-conservation standards; have not implemented water budget based rates; and that do not incorporate newer water-efficient fixture and irrigation technologies.

The Project will utilize several water supplies and on- and off-site water banking facilities to meet potable demand. Available supplies include groundwater and imported water return flows in accordance with the approved Antelope Valley adjudication Judgment and Physical Solution; State Water Project (SWP) supplies secured for Project use and imported to the site under an agreement with the Antelope Valley – East Kern Water Agency (AVEK); and AVEK service area deliveries. Indoor wastewater will be conveyed to one of two Project on-site treatment facilities; will be treated to State unrestricted reuse standards; and will be distributed to meet approximately 40 percent of buildout water demand. The Project's water supplies will sustainably meet buildout potable and recycled water demands and will maintain an average annual reserve supply of more than 79,000 acre-feet, or more than 11 years of full-buildout potable water demand, after buildout has been achieved.

All potable and recycled water use will be metered throughout the Project. The metering data will be compiled by the Project Water Purveyor into two water use reports and submitted to the Los Angeles County DRP at the end of the fifth year following first occupancy or the occupancy of the 4,000th dwelling unit, and at the end of the 10th year or the occupancy of the 10,000th unit, whichever occurs later. The reports will utilize the metering data to verify that the projected water use efficiencies are being achieved and that available supplies are sufficient to meet demand as development occurs. In the event that future water demands are determined to exceed available supplies, the Project Water Purveyor must implement measures to ensure that supplies will be adequate to meet future demand, including such measures as enhanced water budget based rates consistent with applicable legal requirements, increased enforcement, faculty repairs or upgrades, or obtaining supplemental water supplies. No additional development will occur until water use report response measures have been implemented and water supplies are determined sufficient to meet demand to the satisfaction of the DRP.

A Water Supply Assessment (WSA) for the Project was approved in accordance with Sections 10910 et seq. of the *California Water Code* by the Golden Valley Municipal Water District (GVMWD) in May 2011. In January 2017, the Potable Water, Wastewater, and Recycled Water Demands and System Plan (see Appendix 5.19-A of this EIR) for the Project was peer reviewed by Kennedy/Jenks in a report submitted to the County.

In 2014 and 2015, the County of Los Angeles Board of Supervisors published a draft and certified Final Environmental Impact Reports (EIRs) for updates to the *Antelope Valley Area Plan* (AVAP) and to the County General Plan (General Plan Update) and approved the updated AVAP and County General Plan. The approved General Plan update incorporated the previously approved AVAP update, which reduced the level of future growth in unincorporated portions of the Antelope Valley from levels that would have occurred under prior General Plan designations. Antelope Valley regional water supplies and demands were considered in the EIRs prepared for the AVAP and the General Plan Updates.

In 2013, a regional water users group in the Antelope Valley prepared an update to the Antelope Valley Integrated Regional Water Management Plan (AVIRWMP) in accordance with State law. In December 2015, the Superior Court of California approved an adjudication Judgment and Physical Solution that regulates the Antelope Valley groundwater basin. In June 2016, AVEK adopted an update to the Agency's Urban Water Management Plan (UWMP), which incorporates SWP supplies that would be used by the Project and demand and supply projections through 2035. In June 2015, the California Department of Water Resources (DWR) published the State Water Project Final Delivery Capability Report 2015 (DCR), which includes the most recent analysis of SWP current and future reliability. From 2014 to 2016, the Governor of California, other State agencies, and the California legislature implemented several water conservation and management measures in response to a historic drought. A public review draft of proposed permanent state water conservation measures was published by five state agencies in November 2016.

This section updates the information in the 2011 WSA to implement the recommendations in the peer review of the Project's water supply and demand assessment and to include the AVAP and General Plan updates and related CEQA water supply analyses; the AVIRWMP; the approved Judgment and Physical Solution for the Antelope Valley groundwater basin; the AVEK 2015 UWMP; the DCR; and State drought emergency and proposed permanent water conservation measures.

The Project's water facilities will be owned and operated by a Public Water Purveyor or organized as a Community Services District, a statutory water district or PUD with the appropriate capacity to own, operate, and maintain the Project's water system. The Project Water Purveyor will be funded through a rate-payer system and fees. Until the Project Water Purveyor is established, the Project Applicant/Developer will be responsible for all Project-related water services. All of the Project's water supplies and the design, permitting, financing and construction of all treatment, collection and distribution infrastructure will be provided by the Project Applicant/Developer.

Section Format

As described in Section 5.0, Environmental Setting, Impacts, and Mitigation, and in accordance with Article 9 of the State CEQA Guidelines (Contents of Environmental Impact Reports), each topical environmental analysis includes a description of the existing setting; identification of thresholds of significance; analysis of potential Project effects and identification of significant impacts; identification of mitigation measures, if required, to reduce significant impacts; and level of significance after mitigation, if any. This information is presented in the following format (please refer to Section 2.0, Introduction, and Section 5.0, Environmental Setting, Impacts, and Mitigation, for descriptions of each of these topics):

- Introduction
    - Purpose
    - Summary
    - Section Format
    - References
- Relevant Plans, Policies, and Regulations

- Environmental Setting
- Project Design Features
- Threshold Criteria
- Environmental Impacts—A separate analysis is provided for each of the following categories of potential impacts:
    - On-Site Impacts
    - Off-Site Impacts
- Mitigation Measures
- Level of Significance After Mitigation
- References

References

All references cited for the preparation of this analysis are listed in Section 5.18.9. The primary technical references utilized for this section include the following:

1. Golden Valley Municipal Water District (GVMWD). 2011 (May). *Centennial Specific Plan Water Supply Assessment* (Appendix 5.18-A).

2. Psomas. 2017b. *Centennial Specific Plan Development Impacts on Infiltration and Groundwater Recharge.* Santa Ana, CA: PSOMAS (Appendix 5.18-B).

3. California Natural Resources Agency (CNRA). 2015 (July 1). State Water Project Delivery Capability Report 2015 (a Memorandum from E. Reyes (Chief, Central Valley Modeling Section), F. Chung (Chief, Modeling Support Branch), and P.A. Marshall (Chief, Bay-Delta Office) to S. Darabzand, Central Valley Modeling Section, Department of Water Resources) (Appendix 5.18-C).

4. California Superior Court. 2015 (December). *Antelope Valley Groundwater Cases [Proposed] Judgement and Physical Solution* (Santa Clara Case No. 1-05-CV-049053). (Appendix 5.18-D).

5. Antelope Valley – East Kern Water Agency (AVEK). 2012 (October 25). Agreement between Antelope Valley – East Kern Water Agency and Tejon RanchCorp Providing for Importation of Additional SWP Table A Amounts (Appendix 5.18-E).

6. Antelope Valley – East Kern Water Agency (AVEK). 2016 (June). *2015 Urban Water Management Plan* (Appendix 5.18-F). Palmdale, CA: AVEK.

7. Kennedy/Jenks Consultants. 2017 (January). *Peer Review of the Water Supply and Demand Assessment for the Proposed Centennial Specific Plan Development* (Appendix 5.18-G).

8. Psomas. 2017c (February). *Potable Water, Wastewater, and Recycled Water Demands System Plan* (Appendix 5.19-A).

5.18.2 RELEVANT PLANS, POLICIES, AND REGULATIONS

Federal

Drinking Water Quality Standards

Safe Drinking Water Act

The federal Safe Drinking Water Act (SDWA, 42 *United States Code,* Sections 300f et seq. [1974]) is intended to protect public health by regulating the nation's public drinking water supply. The Act authorizes the United States Environmental Protection Agency (USEPA) to set national standards for drinking water supplied by public water systems (generally, water systems that serve at least 25 people or 15 service connections for at least 60 days per year) to protect against both naturally occurring and man-made contaminants. These National Primary Drinking Water Regulations set enforceable maximum contaminant levels for particular contaminants in drinking water or required ways to treat water to remove contaminants. Each standard also includes requirements for water systems to test for contaminants in the water to make sure standards are achieved. The most direct oversight of water systems is conducted by State drinking water programs. States can apply to USEPA for "primacy", which is the authority to implement the SDWA within their jurisdictions, if they can demonstrate that they will adopt and enforce standards at least as stringent as the federal requirements. All states and territories, except Wyoming and the District of Columbia, have received primacy. The Drinking Water Division of the State Water Resources Control Board (SWRCB) has the primary responsibility for implementing the SDWA and related California drinking water laws and regulations in the state.

National Primary Drinking Water Regulations

The National Primary Drinking Water Regulations (NPDWRs or primary standards), also known as maximum contaminant levels (MCLs), are legally enforceable standards set and enforced by the USEPA that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water.

National Secondary Drinking Water Regulations

The National Secondary Drinking Water Regulations (NSDWRs) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The USEPA recommends secondary standards to water systems, but does not require that systems comply with them. However, States may choose to adopt secondary MCLs as enforceable standards. Title 22 of the *California Code of Regulations* (CCR, specifically, Division 4, Chapter 15, Domestic Water Quality and Monitoring Regulations) provides the regulatory requirements for potable water quality in California.

State

California Safe Drinking Water Act

The California Safe Drinking Water Act (Chapter 4, Part 12 of the California Health and Safety Code) improves upon the minimum requirements of the federal Safe Drinking Water Act and outlines the regulations and standards for ensuring that water delivered by public water systems is pure, wholesome, and potable at all times. This Act assigns the responsibilities of the State Water Resources Control Board and other State agencies for implementing the Act, including the establishment of primary drinking water standards and system and operational requirements on affected public water systems and water districts. Regulations related to drinking water are also contained in Titles 17 and 22 of the California Code of Regulations for water operator certifications, water system permits, water quality standards, treatment, and sampling/monitoring, and public notification.

California Energy Commission Appliance Efficiency Standards

The California Energy Commission has been delegated the authority to enact Appliance Efficiency Regulations that include standards for appliances that are and are not federally regulated. The most recent version of the Appliance Efficiency Regulations is codified at in the *California Code of Regulations* (specifically, Title 20, Sections 1601 through 1609, dated July 2015) and contain amendments that were incorporated due to changes in state standards (CEC 2015). The regulations are updated on a regular basis and currently provide efficiency standards for 23 categories of appliances that are sold or offered for sale in California, except appliances sold wholesale in California for final retail sale outside the state or those designed and sold exclusively for use in recreational vehicles or other mobile equipment. The Appliance Efficiency Regulations specify efficiency requirements for several appliances related to residential or other water uses, including plumbing fixtures, faucets, toilets and urinals, clothes washers, water heaters, refrigerators and icemakers, and cooling equipment. Section 1609 of the Appliance Efficiency Regulations establishes a process for imposing administrative civil penalties for violations of the Appliance Efficiency Regulations and became effective on July 1, 2015. The Project will meet or exceed all applicable State appliance efficiency regulatory requirements.

California Green Building Standards Code

The California Green Building Standards Code (CALGreen) was first authorized as a voluntary code by the Department of Housing and Community Development (HCD) and was approved by the California Building Standards Commission (CBSC) in January 2008, with an effective date of August 2009. In a September 2015 report to the state legislature, the HCD stated that the code continues to be improved by considering technologies being developed to complement current practices that help reduce the overall impact on the earth and to preserve current resources; to implement environmentally responsible and resource efficient processes; to reduce negative environmental impacts; and to enhance positive environmental impacts by encouraging more sustainable construction. The CALGreen Code has been amended several times since 2008. In 2011, the code became mandatory throughout the state and, for the first time, established mandatory minimum requirements.

The mandatory provisions of the code were also incorporated into the scoping plan developed by the California Air Resources Board to implement the California Global Warming Solutions Act. In 2013, the Code was amended to include all residential buildings in addition to low-rise buildings (i.e., up to two stories). The HCD has indicated that the 2013 amendments expanded the scope of the regulations to include additions and alterations to conditioned areas, volumes, or sizes and to include additions and alterations to existing buildings that increase the effectiveness of enforceable, sustainable building standards that have a positive impact on the environment (HCD 2016a).

In response to Executive Order B-29-15 (see below), the HCD, in coordination with other State agencies, adopted emergency building standards that require a landscaping water budget that conforms with the more stringent of either a local water efficient landscape ordinance, or the state Model Water Efficient Landscape Ordinance (MWELO), as amended by the DWR. The HCD's emergency CALGreen provisions also modified the formula for calculating allowable water use for residential landscaped areas to reduce potable water landscape use below MWELO requirements. The emergency regulations became effective on June 1, 2015. In 2016, the HCD adopted new residential mandatory requirements in the CALGreen Code that regulate water fixture efficiency and which became effective on January 1, 2017 (HCD 2016b). The Project will meet or exceed all applicable State CALGreen code requirements.

Urban Water Management Planning Act

The Urban Water Management Planning Act (*California Water Code,* Division 6, Part 2.6, Sections 10610–10656) requires water suppliers serving more than 3,000 customers or water suppliers providing more than 3,000 acre-feet (af) of water annually to prepare an urban water management plan (UWMP) to promote water demand management and efficient water use. A UWMP provides a succinct summary of an agency's water supplies, demands, and plans to ensure future reliability, including a discussion of potential water transfers and exchanges, desalination, and recycled water opportunities over a 20-year planning horizon. In 2010, the California legislature amended the *California Water Code* to require that UWMPs include, for the first time, per capita water use reductions of 20 percent by 2020 (*California Water Code,* Section 10608.16). Most of the current UWMPs in California, including the AVEK 2015 UWMP, were most recently updated in 2016.

Integrated Regional Water Management Planning Act

In 2002, the California Legislature enacted the Integrated Regional Water Management (IRWM) Act (*California Water Code,* Sections 10530 et seq.). The purpose of the Act is to encourage local agencies to work cooperatively to manage local and imported water supplies to improve water supply quality, quantity, and reliability. The legislation provides that an IRWM plan may be prepared and adopted by a "regional water management group" (RWMG) consisting of three or more local public agencies, at least two of which have statutory authority over water supply, that participate in the planning process by means of a joint powers agreement, a memorandum of understanding, or other written agreement.

Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (*California Water Code,* Sections 79560–79565), provided $500,000,000 to fund competitive grants for projects consistent with an adopted IRWM plan. In 2006, Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act (*California Public Resources Code,* Sections 75001–75130), provided $1,000,000,000 for IRWM planning and implementation. In the same year, California Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act (*California Public Resources Code,* Sections 5096.800–5096.967), provided $300,000,000 for IRWM storm water flood management planning and implementation.

Sustainable Groundwater Management Act

In 2014, California enacted the Sustainable Groundwater Management Act (*California Water Code,* Sections 10720 et seq.). The Act, and related amendments to California law, require that all groundwater basins designated as high- or medium-priority in the DWR California Statewide Groundwater Elevation Monitoring program and that are subject to critical overdraft conditions must be managed under a new Groundwater Sustainability Plan (GSP) or a coordinated set of GSPs by January 31, 2020. High- and medium-priority basins that are not subject to critical overdraft conditions must be managed under a GSP by January 31, 2022. Where GSPs are required, one or more local groundwater sustainability agencies must be formed to cover the basin and prepare and implement a GSP. The Act is inapplicable to basins that are subject to a Court-approved groundwater adjudication. Section 10720.8(b) of the *California Water Code* provides that the Sustainable Groundwater Management Act is inapplicable to any portions of the Antelope Valley Basin subject to a final adjudication judgment, order, or decree in the Antelope Valley Groundwater Cases proceeding. As discussed below, in December 2015 the Superior Court of California approved a Judgment and Physical Solution that regulates groundwater use in the Antelope Valley Basin and surrounding watershed, including most of the Project site (see Appendix 5.18-D).

State Drought Executive Orders and Emergency Water Conservation Regulations

On January 17, 2014, California Governor Jerry Brown proclaimed a drought state of emergency and directed state officials to take all necessary actions to prepare for drought conditions (State of California 2014). On April 1, 2015, Governor Brown issued an executive order directing the SWRCB to implement mandatory water reductions in urban areas and to reduce California potable urban water use by 25 percent. The order imposed varying degrees of cutbacks on water use affecting homeowners, farms, and other businesses, as well as the maintenance of cemeteries and golf courses. The order included additional water conservation and planning measures, and the potential installation of salinity barriers in the Sacramento Delta (State of California 2015a). Executive Order B-29-15 also requires that groundwater elevation monitoring be implemented throughout the state by the end of 2015.

In May 2015, the SWRCB adopted emergency regulations requiring an immediate statewide 25 percent reduction in potable urban water use measured in terms of residential gallons per capita per day (R-gpcd). The regulation includes variable cutback requirements intended to reduce compliance burdens for water districts and communities that previously reduced water consumption relative to other locations. Certain communities, for example, had achieved significant indoor water use reductions, while others used significantly more water. The regulations and conservation requirements were designed to result in greater per capita cutbacks in locations that used relatively more water compared with more efficient communities. On November 13, 2015, the Governor directed the SWRCB to extend, and potentially modify, the drought emergency water conservation regulation if drought conditions persist through October 2016.

The emergency drought regulations require that each local water provider with more than 3,000 service connections submit monthly residential potable water usage figures to the SWRCB. The SWRCB uses the monthly R-gpcd rates for each provider compared with the provider's 2013 usage for that same month to verify that the mandated reduction level is being achieved. Smaller suppliers were required to report residential water for June through November 2013 and June through November 2015 in December 2015. The regulations allow local water agencies to determine and implement the most cost-effective and locally appropriate methods for reducing water use. The SWRCB publishes the monthly R-gpcd figures for over 400 larger California water suppliers and each supplier's compliance status with applicable conservation requirements online (SWRCB 2015b). In May 2016, the SWRCB modified the emergency regulations and replaced the percentage reduction-based water conservation standard with a localized "stress test" approach that mandates urban water suppliers ensure at least a three year supply of water (SWRCB 2016a).

Executive Order B-37-16 was issued in May 2016 to establish long-term water conservation measures and improve planning for more frequent and severe droughts based on the State's emergency drought conservation success (State of California 2016). The order also requires that the State's urban water suppliers meet new water use targets. In November 2016, the DWR, the SWRCB, the CPUC, the California Department of Food and Agriculture, and the California Energy Commission issued a report on framework for implementing the order. This Framework Report includes an extension of certain emergency regulations and proposed permanent regulations to establish new water use targets, permanent monthly water use reporting, and standards and enforcement to eliminate water waste; improve drought resilience; and improve agricultural water use efficiency and drought planning. The Framework Report also proposes to establish residential, commercial, industrial, and institutional water use performance measures and standards, including a per capita daily water budget for residential indoor and outdoor use, plus losses. The Framework Report states that, until a final standard is established, the State residential indoor water use standard is 55 gallons per capita per day (DWR et al. 2016a).

Senate Bill 610

Section 21151.9 of the *California Public Resources Code* and Sections 10631, 10657, 10910, 10911, 10912, and 10915 of the *California Water Code* (frequently referred to as "Senate Bill [SB] 610") require the County to obtain, utilize in a project's CEQA review process, and provide to the public certain information concerning water supply for residential developments of more than 500 dwelling units and other comparable projects. The amendments enacted by SB 610 require that a CEQA lead agency (in this case, the County of Los Angeles) request a water supply assessment (WSA) from a water supply entity that could provide water for an applicable project. The WSA must analyze the sufficiency of the water supplies available to the potential water supplier to meet existing and anticipated future demands, including the demand associated with the proposed Project, over a 20-year horizon that includes normal (average), single-dry, and multiple-dry years. If required, the WSA must be included and considered by a lead agency in a project's CEQA review documentation, including an EIR. A WSA for the Project was prepared and approved by the GVMWD and is attached as Appendix 5.18-A. The approval of a WSA by a potential water supplier in accordance with SB 610 does not create a right or entitlement to water service or impose, expand, or limit any duty concerning the obligation of a public water system to provide certain service. The County has a separate and independent obligation to assess the sufficiency of water supplies for the Project.

The California Supreme Court has provided additional guidance regarding a lead agency's consideration of water supplies for CEQA purposes (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* [2007] 40 Cal.4th 412,) (*Vineyard*). *Vineyard* states that CEQA does not require assurances of certainty regarding long-term future water supplies at an early phase of planning for large land development projects, such as the approval of a specific plan prior to subsequent construction permits, subdivision map, or similar development entitlement approvals. Requiring water supply certainty at an initial approval stage of a long-term, large-scale development project would likely be unworkable because water planning would far outpace land use planning. Consequently, the certainty required for potential water sources for a project varies with the stage of project approval and is much lower when a conceptual plan is approved than at the time of building permit issuance (*Vineyard*, 40 Cal.4th at 434).

Consistent with these holdings, the Supreme Court identified four principles for conducting a water supply analysis in an EIR (*Vineyard*, 40 Cal.4th at 431–434):

1. An EIR cannot ignore or assume a solution to water supply.
2. An EIR cannot limit the water supply analysis to the first stage of a project.
3. Future water supplies identified and analyzed must bear a likelihood of actually being available.
4. If the uncertainties inherent in long-term land use and water planning make it impossible to confidently identify future water supply sources, the EIR should discuss the uncertainty of the future water supply sources, reasonably foreseeable alternatives (including alternative water sources and the option of restricting future phases of development if sufficient water is not available for future phases), and the significant foreseeable environmental impacts of each alternative water supply source and related mitigation measures to reduce each impact, if any.

This EIR incorporates and considers the *Vineyard* case principles in the analysis of the Project's water supplies.

Senate Bill 221

Section 11010 of the *California Business and Professions Code* and Sections 65867.5, 66455.3, and 66473.7 of the *California Government Code* (frequently referred to as "SB 221") require land use planning agencies, such as the County, to include, as a condition in any tentative map that includes a subdivision involving more than 500 dwelling units, a requirement that a sufficient water supply shall be available. SB 221 provides that proof of the availability of a sufficient water supply to meet the tentative map condition may be requested by the subdivision applicant or local agency, at the discretion of the local agency, and shall be based on written verification from an applicable public water system within 90 days of a request. The statute defines a sufficient water supply as the total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that will meet the subdivision's projected demand in addition to existing and planned future uses, including agricultural and industrial uses.

A subdivision map verification issued in accordance with SB 221 must consider (1) the availability of water supplies over a historical record of at least 20 years; (2) the applicability of an urban water shortage contingency analysis prepared pursuant to Section 10632 of the *California Water Code* that includes actions to be undertaken by the public water system in response to water supply shortages; (3) the reduction in water supply allocated to a specific water use sector pursuant to a resolution or ordinance adopted, or a contract entered into, by the public water system, as long as that resolution, ordinance, or contract does not conflict with Section 354 of the *California Water Code;* and (4) the amount of water that the water supplier can reasonably rely on receiving from other water supply projects, such as conjunctive use, reclaimed water, water conservation, and water transfers. A verification completed in compliance with SB 221 must be supported by substantial evidence. As discussed in Section 4.0, Project Description, the Project does not include proposed subdivision maps, and a water supply verification is not required for Project approval.

Recycled Water Regulations

The State of California has implemented laws that provide for and encourage the use of recycled water. Section 461 of the *California Water Code* states, "It is hereby declared that the primary interest of the people of the state in the conservation of all available water resources requires the maximum reuse of recycled water in the satisfaction of requirements for beneficial uses of water". The State also encourages Californians to develop water recycling projects to help meet potable water demands and to augment surface and groundwater supplies through the provisions of Sections 13500–13556 of the *California Water Code.*

In 2014, regulatory authority over engineering reports for recycled water projects and for regulations applicable to the design of recycled water systems was transferred from the California Department of Public Health to the SWRCB Drinking Water Program. Sections 13500–13557 of the *California Water Code* regulate the protection of the potable water supply through the control of cross-connections with potential contaminants, including recycled water. Water quality standards and treatment reliability criteria for recycled water are codified in Title 22 of the *California Code of Regulations* (Title 22). Title 22 establishes quality and/or treatment processes required to use recycled water for non-potable applications. Title 22 also addresses sampling and analysis requirements at a treatment plant; preparation of an engineering report prior to production or use of recycled water; and general treatment design requirements, reliability requirements, and alternative methods of treatment. Permits are issued to each water recycling project by one of the nine Regional Water Quality Control Boards (RWQCBs). These permits include water quality and public health protections, as detailed in Title 22.

On February 3, 2009, in Resolution No. 2009-0011, the SWRCB adopted a Recycled Water Policy (Policy) (SWRCB 2009). The Policy states, "In the face of an unprecedented water crisis due to the collapse of the Bay-Delta ecosystem, climate change, continuing population growth combined with a severe drought on the Colorado River and failing levees in the Delta, the SWRCB has adopted a Recycled Water Policy in an effort to move aggressively towards a sustainable water future". The SWRCB Policy also states "we declare our independence from relying on the vagaries of annual precipitation and move towards sustainable management of surface waters and groundwater, together with enhanced water conservation, water reuse and the use of stormwater". The following goals were included in the Policy:

- Increase use of recycled water over 2002 levels by at least 1 million afy by 2020 and at least 2 million afy by 2030.
- Increase the use of storm water over use in 2007 by at least 500,000 afy by 2020 and at least 1 million afy by 2030.
- Increase the amount of water conserved in urban and industrial areas by comparison to 2007 by at least 20 percent by 2020.
- Substitute as much recycled water for potable water as possible by 2030.

The SWRCB Policy provides direction to the RWQCBs regarding appropriate criteria to be used in issuing permits for recycled water projects and is intended to streamline recycled water project permitting, while providing the RWQCBs with sufficient authority and flexibility to address site-specific conditions. The Policy encourages other public agencies to consider the benefits of using recycled water in evaluating the impacts of recycled water projects on the environment as required by CEQA. The Policy also acknowledges that the SWRCB shares jurisdiction over the use of recycled water with the RWQCBs and recognizes that the DWR and California Public Utilities Commission (CPUC) have important roles in encouraging the use of recycled water. The Policy provides guidance concerning these roles. The Policy also includes incentives for using recycled water.

The Policy notes that (1) some groundwater basins contain salts and nutrients that exceed or threaten to exceed water quality objectives established in Basin Plans; (2) all salts and nutrients should be managed on a basin-wide or watershed-wide basis through development of regional or sub-regional management plans; (3) every groundwater basin/sub-basin in California is to have a consistent, locally driven salt/nutrient management plan developed by water and wastewater entities, together with contributing stakeholders in collaborative processes, including compliance with CEQA and participation by RWQCB staff. The Policy describes the components of these salt and nutrient management plans. Finally, the Policy addresses the control of incidental runoff from landscape irrigation projects, recycled water, groundwater recharge projects, antidegradation factors, control of emerging constituents, and chemicals of emerging concern.

In 2009, the SWRCB adopted a General Permit for landscape irrigation uses of recycled water to facilitate the California Legislature's intent to promote the use of recycled water (SWRCB Order No. 2009-0006-DWQ). The General Permit streamlines the regulatory process for the irrigation use of disinfected tertiary recycled water produced by a public entity at a municipal wastewater treatment facility. Such uses include parks, greenbelts, and playgrounds; school yards; athletic fields; golf courses; cemeteries; residential landscaping in common areas; commercial and industrial landscaping, except eating areas; and freeway, highway, and street landscaping. In June 2016, the SWRCB adopted General Order No. 2016-0068-DDW. The order provides a streamlined Notice of Intent process for the beneficial, non-potable use of recycled water consistent with the California Uniform Statewide Recycling Criteria, except recycled water use to replenish groundwater resources, the disposal of treated wastewater in percolation ponds, and excessive hydraulic loading of recycled water in use areas where the primary purpose of the activity is disposal of treated wastewater and direct potable reuse (SWRCB 2016b).

Regional

Basin Plans

The *California Water Code* requires that each RWQCB regulate water quality in accordance with adopted basin plans. The applicable basin plans adopted by the RWQCBs with jurisdiction in the Antelope Valley are described in Section 5.2.2 of Section 5.2, Hydrology and Flood, of this EIR.

Water Management Plans

Current water management plans that analyze demand and supply in the Antelope Valley on a regional basis include the *2015 Urban Water Management Plan* adopted by AVEK and the 2013 AVIRWMP prepared under a memorandum of understanding (MOU) by an 11-member Regional Water Management Group consisting of the AVEK, the Antelope Valley State Water Contractors Association, the City of Lancaster, the City of Palmdale, the Littlerock Creek Irrigation District, Los Angeles County Sanitation District Nos. 14 and 20, Los Angeles County Waterworks District 40 (LACWWD40), the Palmdale Water District (PWD), the Quartz Hill Water District (QHWD), and the Rosamond Community Services District (RCSD).

An IRWM plan for the Antelope Valley was first prepared and adopted in 2007. The 2007 AVIRWMP was subsequently updated in 2013 to include new information required by the 2012 Integrated Regional Water Management Proposition 84 Guidelines adopted by DWR and more current water demand and supply information. The 2013 AVIRWMP analyzes water supplies and demands in the Antelope Valley region, including imported water, groundwater, local supplies, and urban and agricultural demand, for average, single-dry, and multiple-dry years through 2035.

AVEK is the largest SWP contractor in the Antelope Valley region and provides imported water on a wholesale basis to local and retail purveyors in incorporated and unincorporated areas of Antelope Valley. As discussed below, AVEK has also executed an agreement with the Tejon Ranch Company (TRC) to import water purchased by TRC for Project use. The Project site is located within the existing AVEK service and assessment area. The 2015 UWMP adopted by AVEK in 2016 analyzes anticipated SWP imported supplies (including potential banked and stored imports) and demand through 2035.

LACWWD40 provides water for urban use throughout the Antelope Valley and is governed by the Los Angeles County Board of Supervisors. In January 2017, the LACWWD40 published an approved final draft of the 2015 UWMP. The Project is not located within the LACWWD40 service area and will not be served by the District. The District's 2015 UWMP includes a discussion of several of the regional water supplies that will be used to meet Project demand, such as SWP imports through AVEK and groundwater in accordance with the adopted Judgement and Physical Solution for the Antelope Valley Groundwater Basin.

Antelope Valley Groundwater Adjudication Judgment and Physical Solution

The Antelope Valley Groundwater Basin is regulated in accordance with a Court-approved adjudication Judgment and Physical Solution entered in December 2015 in the consolidated complex proceedings commonly known as the "Antelope Valley Groundwater Cases". The procedural history of the litigation dates from a 1999 lawsuit filed by a farming company and a general groundwater adjudication for the Antelope Valley Groundwater Basin that was initiated by LACWWD40 in 2004. In 2005, the Judicial Council of California consolidated several related lawsuits (Judicial Council Coordination Proceeding No. 4408), which were assigned to the Hon. Jack Komar in the Santa Clara County Superior Court (Case No. 1-05-CV-049053). Four trial phases were completed in the proceeding, including the determination of the adjudication basin boundaries (Phase 1); the determination that all of the basin is hydrologically connected for adjudication purposes (Phase 2); the determination that the basin is overdrafted and that the total sustainable yield, including native groundwater and return flows, is approximately 110,000 afy (Phase 3); and the determination of groundwater production amounts for parties to the proceedings during 2011 and 2012 (Phase 4).

A "physical solution" refers to an agreed upon or judicially imposed resolution of conflicting groundwater claims in a manner that advances the California constitutional rule of reasonable and beneficial use of the state's water supply (*City of Santa Maria v. Adam* [2012] 211 Cal. App. 4th 266, 288). To achieve these objectives, a physical solution establishes an equitable remedy designed to alleviate overdrafts and the consequential depletion of water resources in a particular area, consistent with the constitutional mandate to prevent waste and unreasonable water use and to maximize the beneficial use of limited resources (*California American Water v. City of Seaside* [2010] 183 Cal. App. 4th 471, 480).

The Judgment and Physical Solution adopted for the Antelope Valley establishes a regional watermaster to regulate groundwater use consistent with applicable law and the total sustainable yield of the basin under the auspices of the court. As of January 2016, all groundwater users in the basin are required to begin a 7-year "rampdown" period during which groundwater production will be reduced to levels consistent with the total sustainable yield of approximately 110,000 afy. Among other provisions, the Judgment and Physical Solution allows for interbasin groundwater transfers subject to watermaster approval; water banking in accordance with storage agreements with the watermaster; the production of return flows from imported water use in the Antelope Valley; the production of return flows from imported water use in the watershed surrounding the basin subject to watermaster approval; and the carryover and storage of unused groundwater allocations (see "Antelope Valley Groundwater Basin" in Section 5.18.3). The Judgment and Physical Solution approved by the court is attached as Appendix 5.18-D.

Los Angeles County General Plan and Antelope Valley Area Plan

The Los Angeles County General Plan and the Antelope Valley Area Plan (AVAP), a component of the General Plan, include goals and policies that address water supply issues in the unincorporated County. The Los Angeles County Board of Supervisors approved updates to the General Plan and the AVAP and certified the CEQA environmental impact reports for these updates in 2014 and 2015. The General Plan provides goals and policies to achieve countywide planning objectives and serves as the foundation for all community-based plans (including the AVAP), which focus on land use and policy issues that are specific to a planning area. The AVAP update was approved prior to the approval of the General Plan update and effectively implements the Antelope Valley Reduced Intensity Alternative analyzed in the General Plan Update Draft EIR. The Public Services and Facilities Element of the General Plan includes general policies related to water supply. The Conservation and Open Space (COS) section of the AVAP sets forth substantially similar water supply and related goals and polices, including the following:

Goal COS 1: Growth and development are guided by water supply constraints.

> **Policy COS 1.1:** Require that all new development proposals demonstrate a sufficient and sustainable water supply prior to approval.
>
> **Policy COS 1.2:** Limit the amount of potential development in areas that are not or not expected to be served by existing and/or planned public water infrastructure through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
>
> **Policy COS 1.3:** Limit the amount of potential development in groundwater recharge areas through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
>
> **Policy COS 1.4:** Promote the use of recycled water, where available, for agricultural and industrial uses and support efforts to expand recycled water infrastructure.

Goal COS 2: Effective conservation measures provide an adequate supply of clean water to meet the present and future needs of humans and natural ecosystems.

> **Policy COS 2.1:** Require new landscaping to comply with applicable water efficiency requirements in the County Code.
>
> **Policy COS 2.2:** Require low-flow plumbing fixtures in all new developments.
>
> **Policy COS 2.3:** Require onsite stormwater infiltration in all new developments through the use of appropriate measures, such as permeable surface coverage,

permeable paving of parking and pedestrian areas, catch basins, and other low impact development strategies.

Policy COS 2.4: Discourage water intensive recreational uses, such as golf courses, unless recycled water is used to sustain these uses.

Policy COS 2.5: Discourage the use of potable water for washing outdoor surfaces.

Policy COS 2.6: Support experiments in alternate forms of water provision and re-use, such as "air to water technology" and gray water systems.

Policy COS 2.7: Limit use of groundwater sources to their safe yield limits.

Policy COS 2.8: Coordinate with federal, state, regional and local agencies to develop and implement new technologies in water management.

Goal COS 3: A clean water supply untainted by natural and man-made pollutants and contaminants.

Policy COS 3.1: Discourage the use of chemical fertilizers, herbicides and pesticides in landscaping to reduce water pollution.

Policy COS 3.2: Restrict the use of septic systems in areas adjacent to aqueducts and waterways to prevent wastewater intrusion into the water supply.

Policy COS 3.3: Require a public or private sewerage system for land use densities that would threaten nitrate pollution of groundwater if unsewered, or when otherwise required by County regulations.

Policy COS 3.4: Support preservation, restoration and strategic acquisition of open space to preserve natural streams, drainage channels, wetlands, and rivers, which are necessary for the healthy functioning of ecosystems.

Policy COS 3.5: Protect underground water supplies by enforcing controls on sources of pollutants.

Policy COS 3.6: Support and encourage water banking facilities throughout the Antelope Valley, including within Significant Ecological Areas.

The Project will comply with the water-related goals and policies in the AVAP. Section 5.8, Land Use, Entitlements, and Planning, presents an in-depth analysis of the Project's consistency with relevant plans, policies, and regulations. Section 5.2, Hydrology and Flood, and Section 5.4, Water Quality, discuss the Project's potential impacts to groundwater, surface flows, and related AVAP goals and policies.

Los Angeles County Green Building and Low Impact Development Standards

In 2008, the County adopted the Green Building Program, which included the Drought-Tolerant Landscaping, Green Building, and Low Impact Development Ordinances (the Ordinances), and created an Implementation Task Force and Technical Manual. In November 2013, in response to the mandates set forth in the 2010 California Green Building Standards (CALGreen) Code, the Board of Supervisors adopted the Los Angeles County Green Building Standards Code (Title 31). The CALGreen Code and the Ordinances adopted in 2008 comprise the County's primary green building and low impact development (LID) standards.

5.18.3 ENVIRONMENTAL SETTING

This section discusses the water supply and demand in the Antelope Valley region. Water in the Antelope Valley is supplied from three primary sources: (1) naturally occurring water accumulated as surface water or groundwater from rain and snow; (2) imported surface water collected in Northern California and conveyed through the SWP to the region; and (3) a smaller quantity of surface water stored in the Littlerock reservoir located to the south of Palmdale on the north side of the San Gabriel Mountains (DRP 2014). The first section below discusses groundwater in the Antelope Valley and the effects of the Antelope Valley Groundwater Basin adjudication Judgment and Physical Solution on regional groundwater supplies. The second section below discusses the reliability of the SWP system with reference to the DCR published by the DWR in June 2015 and the 2015 AVEK UWMP. The third section summarizes the regional water supply and demand projections in the AVIRWMP, the most recent regional analysis, and the AVEK 2015 UWMP (AVEK 2016). The fourth section discusses regional water quality.

Antelope Valley Groundwater Basin

The Antelope Valley is located in the southwestern portion of the Mojave Desert in Southern California, about 40 miles north of the city of Los Angeles. Approximately $^2/_3$ of the Valley is located in northern Los Angeles County, and the remainder is located in southeastern Kern County. The Valley is bound on the south and west by the San Gabriel and Tehachapi Mountains; on the north by the Rosamond and Bissell Hills; and on the east by the Hi Vista area buttes and alluvial fan. The Fremont Valley is located to the north and the Victor Valley to the east of the Antelope Valley Basin (DRP 2014).

The Antelope Valley is considered to be a closed hydrologic basin because water drains into, but not out of, the Valley. It extends over approximately 1,390 square miles. The Antelope Valley is comprised of relatively flat valley land and dry lake beds, with coalescing alluvial fans and scattered buttes around the periphery. The basin is topographically closed on the north and northwest by the Garlock Fault at the base of the Tehachapi Mountains, and on the south and southwest by the San Andreas Fault at the base of the Transverse Ranges, which include the San Gabriel Mountains. Surface elevations in the Valley range from about 2,300 feet to nearly 3,500 feet above mean sea level. Several creeks, including the perennial Big Rock and Little Rock Creeks, drain the surrounding mountains, cross the alluvial fans, and become dry washes in the Valley. The Los Angeles Aqueduct traverses the western end of the Valley, and the California Aqueduct runs along the Valley's southern edge, flanking the San Gabriel Mountains (DRP 2014).

Urban centers in the Antelope Valley include the cities of Lancaster, Palmdale, and Rosamond along State Route (SR) 14, as well as a large portion of Edwards Air Force Base (AFB) in the Valley's northeast corner. The Palmdale and Lancaster urbanized area has grown rapidly since the 1980s and has a current population of approximately 280,000 residents. Agricultural lands occupy various areas near the cities and Edwards AFB, and comprise approximately 25,000 acres (DRP 2014). Exhibit 5.18-1, Primary Features in the Antelope Valley Groundwater Basin, provides an aerial photograph that depicts the Project site in relation to the primary topographic features of the Antelope Valley Groundwater Basin.

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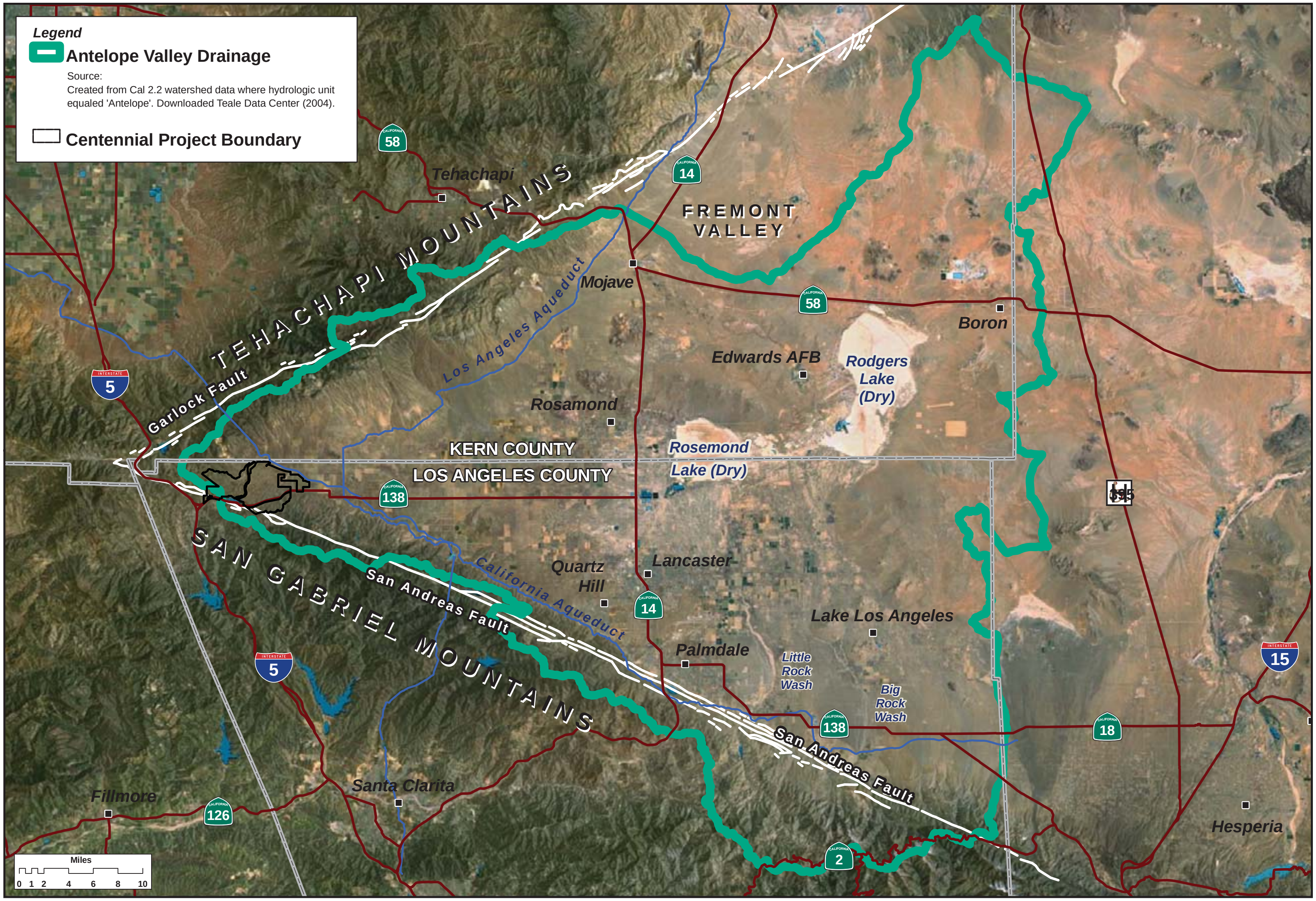

Source: GVMWD 2011; BonTerra Psomas 2015

Primary Features in the Antelope Valley Groundwater Basin

Exhibit 5.18-1

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The Antelope Valley Groundwater Basin's storage capacity has been reported to range from 68 million af to 70 million af (DWR 2004). Agricultural and urban uses have been the primary sources of extraction from the groundwater system. The Project site overlays the far western portion of the basin, and is located approximately 20 miles to the east of these subsidence areas.

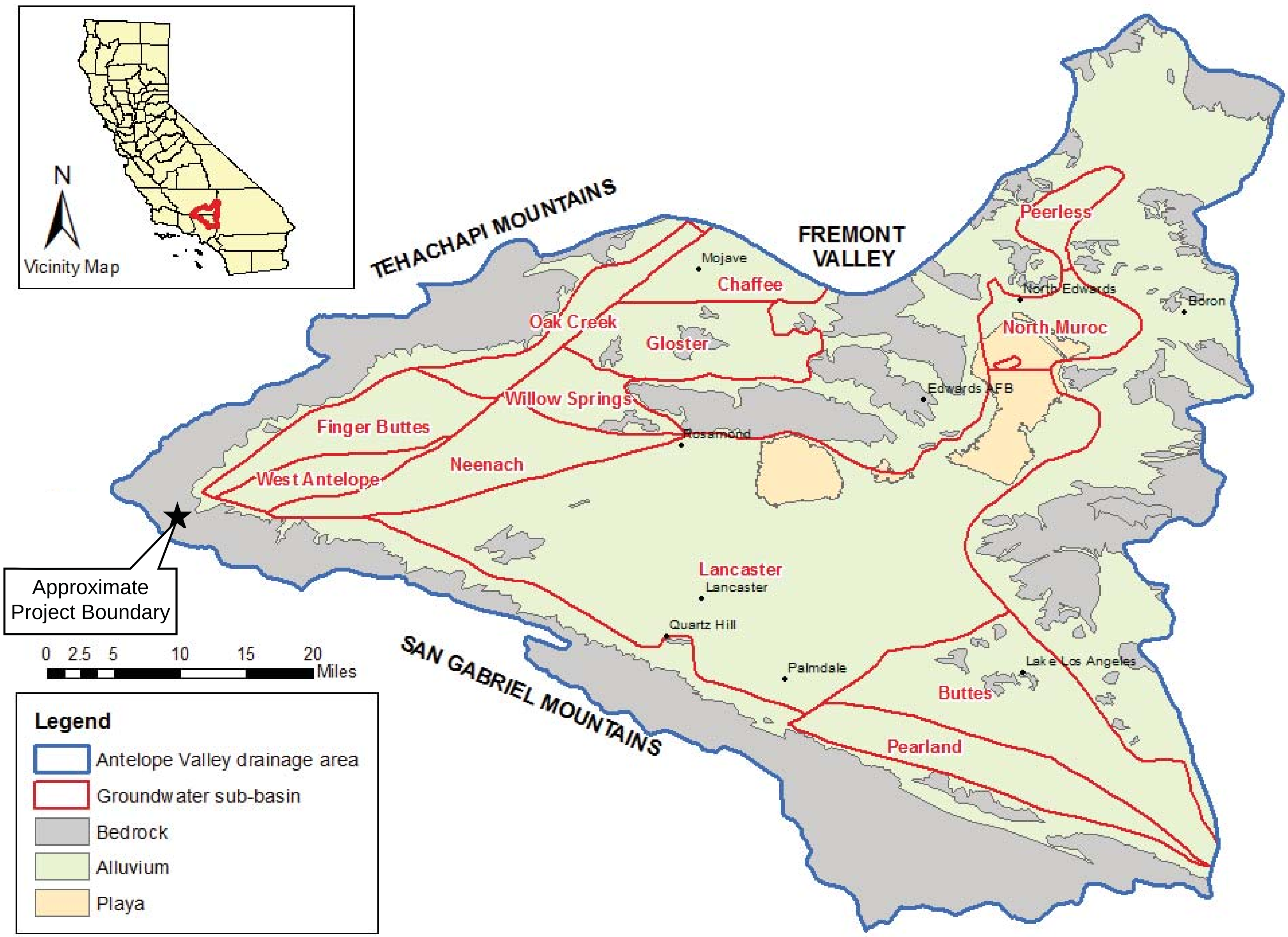
The basin includes two primary aquifers: (1) the principal aquifer and (2) the deep aquifer. The principal aquifer is an unconfined aquifer. The basin is principally recharged by deep percolation of precipitation and runoff from the surrounding mountains and hills. Separated from the principal aquifer by clay layers, the deep aquifer is generally considered to be confined. The principal aquifer is typically thickest in the southern portion of the Valley near the San Gabriel Mountains, while the deep aquifer is thickest in the vicinity of the dry lakes on Edwards AFB. The basin is divided into 12 subunits: Finger Buttes, West Antelope, Neenach, Willow Springs, Gloster, Chaffee, Oak Creek, Pearland, Buttes, Lancaster, North Muroc, and Peerless (LACWWD40 2017). The Project site is located in the extreme western portion of the Antelope Valley groundwater basin, and overlies the Finger Buttes and West Antelope subunits (see Exhibit 5.18-2, Groundwater Sub-basins in the Antelope Valley Groundwater Basin, and Exhibit 5.18-5, Location of Study Area, Tejon Ranch Company Land, and the Project Site). The locations of the 12 subunits in the Antelope Valley Groundwater Basin are shown in Exhibit 5.18-2.

Substantial groundwater pumping in the Antelope Valley began in the early 1900s and peaked in the 1950s. In some localized areas, the rate of decline has slowed. Groundwater levels have increased slightly in the rural western and far northeastern areas of the region (DRP 2014).

In approximately 1999, agricultural interests in the Antelope Valley initiated litigation seeking to determine certain rights to groundwater. In 2004–2005, the litigation was consolidated and certain public water suppliers, including Los Angeles County Waterworks District 40, sought an adjudication of groundwater rights in the basin. Four trial phases were subsequently completed and, in December 2015, a Judgment and Statement of Decision adopting a Judgment and Physical Solution for the basin were entered by the Court (CSC 2015; see Appendix 5.18-D). The adjudication determined that the Antelope Valley Basin was in a state of overdraft for over 50 years and that the total sustainable yield of the basin, including both native groundwater safe yield and return flows from imported water use, is approximately 110,000 afy. Pursuant to the Judgment and Physical Solution, a watermaster appointed under the auspices of the court will monitor and regulate groundwater use in the basin. The Judgment and Physical Solution also includes the following provisions (CSC 2015):

(1) An allocation of overlying rights to the basin's adjusted native safe yield to specific parties in Exhibit 4 of the Judgment and Physical Solution that will be implemented over a seven-year rampdown period starting in January 2016. The Tejon Ranch Company and Tejon RanchCorp are allocated a post-rampdown right to 1,634 afy in Exhibit 4 of the Judgment and Physical Solution.

(2) Parties that import water through AVEK and that are identified on Exhibit 8 of the Judgment and Physical Solution may produce return



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Source: Draft Salt and Nutrient Management Plan for the Antelope Valley June 2013

Groundwater Sub-basins in the Antelope Valley Groundwater Basin — Exhibit 5.18-2

Centennial Project

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(4) All parties have the right to store water in the basin pursuant to a storage agreement with the watermaster. The Judgment and Physical Solution does not limit or modify the operation of preexisting banking projects or the performance of preexisting exchange agreements, including existing water banks operated by the Tejon Ranch Company and Tejon RanchCorp.

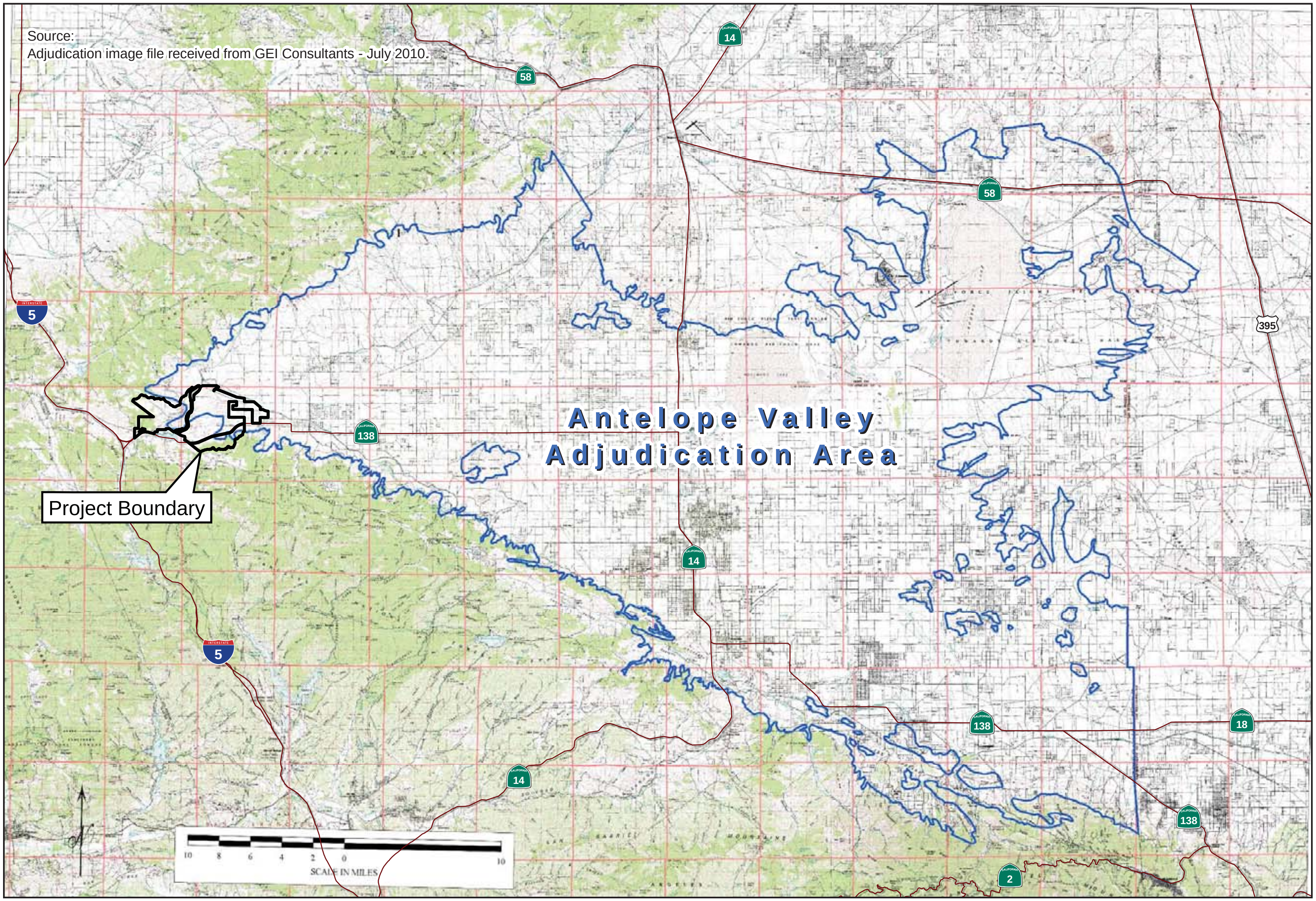
(5) Unproduced portions of a groundwater allocation may be carried over for 10 years and stored after the carry-over period subject to the terms and conditions of a storage agreement approved by the watermaster.

(6) Pursuant to terms and conditions established by the watermaster and subject to hydrologic review by an engineer retained by the watermaster, a party may transfer all or any portion of its applicable groundwater production rights to another party so long as the transfer does not cause a "material injury", as defined in the Judgment and Physical Solution.

(7) The Tejon Ranch Company and Tejon RanchCorp are included in the list of parties that conduct business and that may produce and transport groundwater for use on lands outside the basin and within the watershed of the basin, as shown in Exhibit 9 of the Judgment and Physical Solution.

Exhibit 5.18-3, Antelope Valley Adjudication Area, depicts the boundaries of the adjudication area in relation to the Project site boundaries. Exhibit 5.18-4, Project Site and Tejon Ranch Company Land Ownership within the Antelope Valley Adjudication Area, shows a more detailed depiction of the Project site and Tejon Ranch Company (TRC) land ownership in the Antelope Valley Adjudication Area. Exhibit 5.18-5, Location of Study Area, Tejon Ranch Company Land, and the Project Site, shows the Project site in relation to the extreme western portion of the Antelope Valley Groundwater Basin, overlying the Finger Buttes and West Antelope subunits.

The purpose of the Antelope Valley Adjudication Judgment and Physical Solution is to allow for groundwater use in a manner that avoids overdraft and fosters sustainable beneficial uses by limiting production to the basin's total sustainable yield of approximately 110,000 afy. As a result, groundwater production in accordance with the Judgment and Physical Solution is considered a very reliable supply for the Antelope Valley region even in short-term and during multiple-year droughts (RWMG 2013).



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Source: GVMWD 2011; BonTerra Psomas 2015

Antelope Valley Adjudication Area

Exhibit 5.18-3

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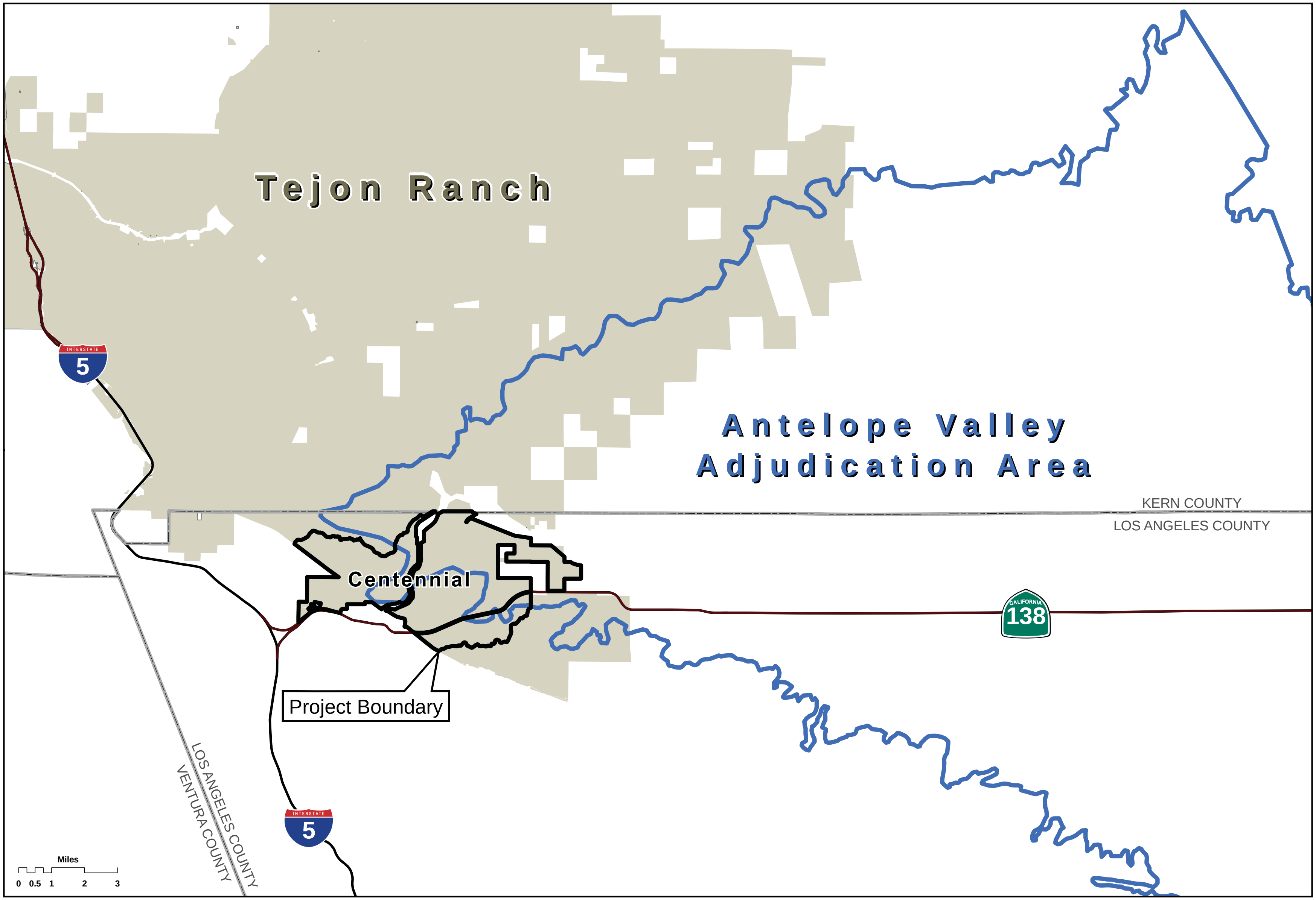

Source: GVMWD 2011; BonTerra Psomas 2015

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Project Site and Tejon Ranch Company Land Ownership within the Antelope Valley Adjudication Area **Exhibit 5.18-4**

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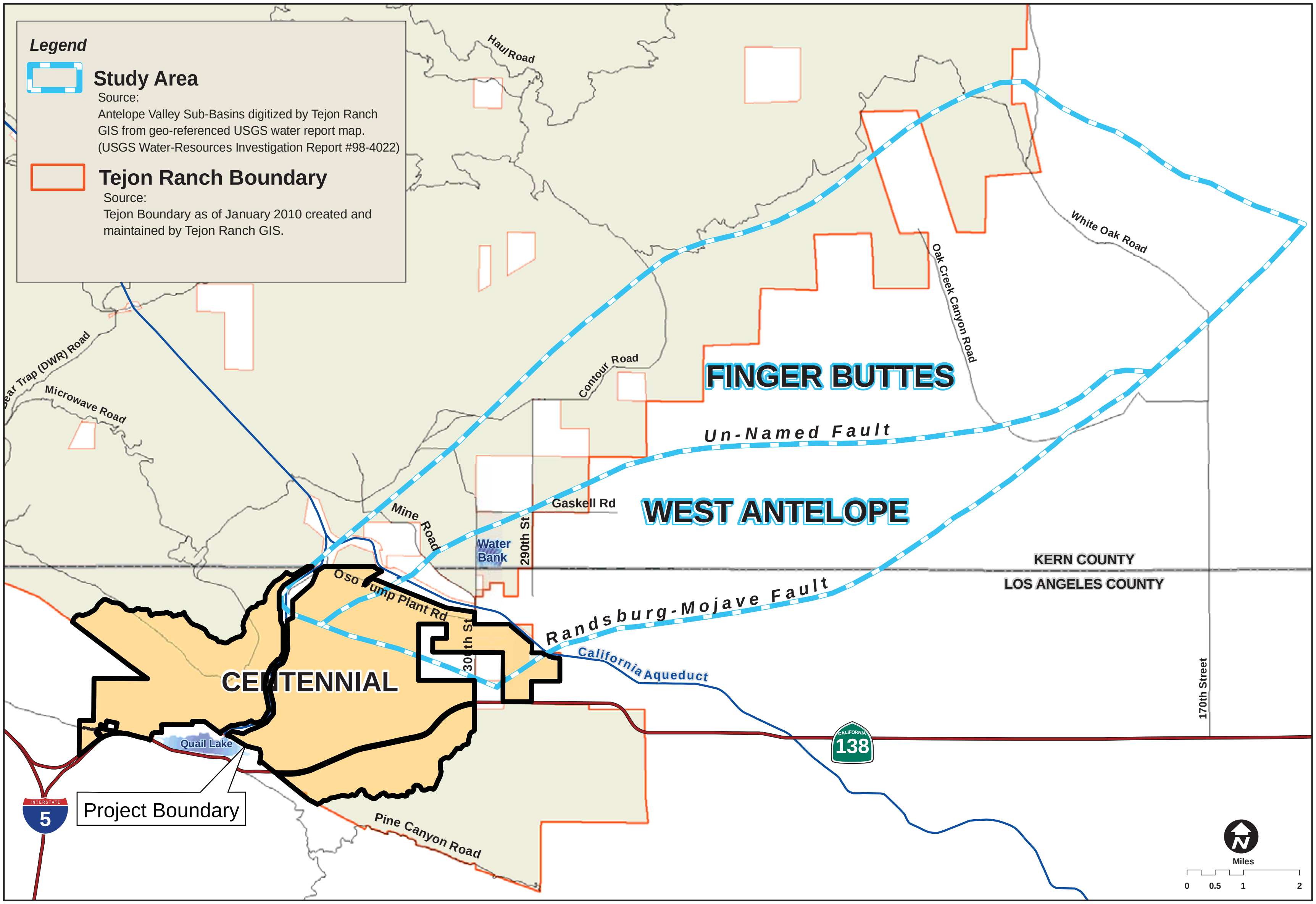

Source: GVMWD 2011; BonTerra Psomas 2015

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Location of Study Area, Tejon Ranch Company Land, and the Project Site

Exhibit 5.18-5

Centennial Project

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Imported State Water Project (SWP) Water Supplies

State Water Project Overview

In 1959, California approved a $1.75 billion general obligation bond that enabled the Department of Water Resources (DWR) to commence construction of the State Water Resources System, commonly known as the SWP. The SWP is the nation's largest State-built water and power development and conveyance system; it includes 660 miles of aqueduct and conveyance facilities extending from Lake Oroville in the north to Lake Perris in the south. In addition to these facilities, the system includes pumping and power plants, reservoirs, lakes, storage tanks, canals, tunnels, and pipelines that capture, store, and convey water throughout the state. The DWR operates and manages the SWP facilities. The SWP was designed and built to (1) deliver water; (2) control floods; (3) generate power; (4) provide recreational opportunities; and (5) enhance fish and wildlife habitats (DWR 2010).

SWP water originates in various streams that are tributary to the Sacramento – San Joaquin River Delta (Delta). A portion of water derived from the Feather River is stored in Lake Oroville, which releases previously stored water back into the Feather River and then to the Sacramento River. These flows and other natural, unstored Sacramento River flows reach the Delta, where water is pumped into the California Aqueduct from SWP facilities located on the southern edge of the Delta. The pumping plant also diverts natural flows from the San Joaquin River and various east-side streams. The SWP aqueduct system, which includes several south-of-the-Delta reservoirs, delivers water to the base of the Tehachapi Mountains, where a pumping system lifts the water through a series of pipelines to the south. Just north of the Project site, the Aqueduct branches into the West Branch, which conveys water south through the greater Los Angeles area, and the East Branch, which traverses the northern side of the San Gabriel Mountains.

At the inception of the SWP, the DWR entered into individual water supply contracts with agricultural and urban water agencies (SWP contractors) throughout California. The contracts were the method used to repay the costs of construction and operation of the SWP facilities for the delivery of water to the SWP contractors. Each such contract sets forth a maximum annual allocation of SWP water to that contractor, which is stated in Table A in the contract. As a result, each contractor's allocation of SWP water is referred to as a "Table A Amount".

Article 21 of the SWP contracts allows a contractor to receive surplus SWP water that may exist in the Delta on an unscheduled and interruptible basis ("Article 21 water"). This water supply has historically been available only in average to wet years, and generally only for a limited time in the late winter. As discussed below, species and water quality regulatory constraints have increasingly affected the reliability of Delta water supplies, including the potential availability of Article 21 water. According to the AVIRWMP, Article 21 water is generally delivered most readily to agricultural contractors and to San Joaquin Valley banking programs and is not considered a long-term reliable supply for the Antelope Valley region (RWMG 2013). Although the DWR continues to project that Article 21 water will be available in the future, the analysis of Project water supplies in Section 5.18.6 conservatively assumes that no such water will be used to meet demand.

There are 29 SWP contractors, including three in the Antelope Valley region: the AVEK, the Palmdale Water District (PWD), and the Littlerock Creek Irrigation District (LCID). The SWP delivers water to each contractor in accordance with the system's supply availability and contractor demands. By October 1 of every year, each contractor provides the DWR with a request for water delivery that cannot exceed its full Table A Amount. Actual deliveries may be less than a contractor's request due to hydrology, stored water availability, and regulatory or operating constraints. When available SWP water is less than what a contractor requests, each contractor receives a percentage of its Table A Amount based on SWP supplies (RWMG 2013).

The SWP is contracted to deliver up to 4.17 million afy of Table A water. AVEK is the state's third largest water contractor and has a Table A Amount of approximately 144,844 afy. The AVIRWMP estimates that approximately three percent of AVEK's Table A deliveries have historically been supplied to customers outside the Antelope Valley. As a result, the AVIRWMP estimates that a maximum of 137,150 afy of the total AVEK Table A Amount is available for delivery in the Antelope Valley. As discussed below, certain Table A Amounts have been secured for Project use from two Central Valley water districts and were assigned to AVEK in accordance with SWP rules and regulations. The AVEK wholesale demands for TRC in Table 4-2 of the 2015 UWMP (AVEK 2016) and in the AVIRWMP do not include these Project-specific amounts. The PWD has a Table A Amount of 21,300 afy, and the LCID has a Table A Amount of 2,300 afy (RWMG 2013). The Project is not located within the service area of, and would not be served by, the PWD or the LCID.

Due to several factors, the total volume of SWP Table A Amounts delivered each year is subject to annual variation. The DWR publishes an assessment of the SWP system's existing and future reliability on a biannual basis. The most recent assessment by the DWR is the DCR published in June 2015. The following sections discuss the primary regulatory and other factors affecting SWP reliability identified in the DCR.

Endangered Species Protection Measures Affecting Delta Water Exports

Several species protected under the Federal Endangered Species Act (FESA) are located in the south Delta and are potentially affected by the SWP and nearby federal water project extraction pumps. As a result, the operation of the SWP and federal pumps requires FESA incidental take permits pursuant to biological opinions (BiOps) issued by the U.S. Fish and Wildlife Service (USFWS) for freshwater fish and the National Marine Fisheries Service (NMFS) for anadromous fish (ocean-dwelling fish that spawn in fresh water, such as salmonids) and marine mammals. Certain of these species are also protected under the California Endangered Species Act (CESA) and require state incidental take authorizations from the California Department of Fish and Wildlife (CDFW). CESA allows the CDFW to authorize State incidental take for species also protected under the FESA by making a determination that a federal incidental take permit is consistent with CESA requirements (this is known as a CESA "consistency determination").

Since 1993, several BiOps have been issued for SWP Delta operations that restrict SWP exports from the Delta to specific amounts at certain times and conditions to protect listed species. In February 1993, the NMFS issued a BiOp for winter-run Chinook salmon, and the

USFWS issued a BiOp in March 1995 for the delta smelt and splittail. These BiOps imposed Delta inflow, Delta outflow, and export pumping restrictions, many of which were incorporated by State water quality regulators in the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento – San Joaquin Delta (see the discussion of water quality regulations below).

In 2005, the USFWS issued a BiOp concluding that certain proposed coordinated SWP and federal water project operations in the Delta would not jeopardize the continued existence of the delta smelt or result in the destruction or adverse modification of smelt critical habitat. In response to lawsuits, the 2005 BiOp was vacated and the USFWS was ordered to prepare a new opinion. The USFWS issued a revised BiOp in 2008, which determined that the proposed water project operations in the Delta would jeopardize the delta smelt.

Similarly, in 2004, the NMFS issued a BiOp concluding that the proposed coordinated SWP and federal Delta water project operations would not jeopardize protected salmonids, green sturgeon, or "southern resident" killer whales. The 2004 BiOp was also vacated after legal challenge and, in June 2009, the NMFS issued a revised BiOp concluding that the operations would jeopardize the species.

In accordance with the FESA, the BiOps identified "reasonable and prudent alternatives" that would avoid jeopardy to the species, including several Delta operational limitations that further reduce the potential amount of SWP supplies that can be delivered to system contractors. The USFWS BiOp limits SWP exports in 10 of 12 months of each year, including Delta flow restrictions that are adaptively managed as determined by USFWS staff on the basis of flow and fish population monitoring data. Delta target flows are primarily accomplished by reducing SWP and federal water exports. The USFWS BiOp also includes additional salinity requirements in September and October for wet and above-normal water years that require increased releases from SWP and federal reservoirs upstream of the Delta. The NMFS BiOp limits exports during April and May in all but extremely wet years.

The 2008 USFWS and 2009 NMFS BiOps were invalidated in federal court on various grounds, including the failure to use the best available science in the development of the opinions. Both decisions were appealed to the Ninth Circuit Court of Appeals and subsequently reversed in 2014 (March 2014 for the USFWS BiOp and December 2014 for the NMFS BiOp). The CDFW issued consistency determinations for both federal BiOps under Section 2080.1 of the *California Fish and Game Code* to provide for state incidental take coverage under the CESA. The SWP system is currently subject to the 2008 USFWS and 2009 NMFS BiOps that were upheld by the Ninth Circuit in 2014 and the CESA consistency determinations issued by the CDFW.

<u>Delta Inflows</u>

SWP deliveries are affected by the volume of Delta inflows, which vary considerably from season to season and from year to year. In an above-normal year, nearly 85 percent of the total Delta inflow comes from the Sacramento River; more than 10 percent comes from the San Joaquin River; and the rest comes from the 3 eastside streams (i.e., the Mokelumne, the Cosumnes, and the Calaveras Rivers). Water years are designated by DWR as "wet" (W), "above normal" (AN), "below normal" (BN), "dry" (D), or "critical" (C). In general, much less water will flow into the Delta during a dry or critical water year than during a wet or above-normal water year. Fluctuations in inflows affect Delta water quality and fish habitat which, in turn, trigger regulatory requirements that constrain SWP Delta pumping.

About 80 percent of annual precipitation occurs between November and March, and very little rain typically falls from June through September. Upstream reservoirs regulate inflow variability by reducing flood flows during the rainy season and by storing water to be released later in the year to meet water demands and flow and water quality requirements.

<u>Water Quality Objectives</u>

In its 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento – San Joaquin Delta (WQCP), the SWRCB set water quality objectives to protect beneficial uses of water in the Delta and Suisun Bays. The objectives include minimum Delta outflows, limits on SWP and federal Delta exports, and maximum allowable salinity levels and are enforced through the provisions of Water Right Decision 1641 (D-1641), issued in December 1999 and updated in March 2000 by the SWRCB.

The WQCP and D-1641 include certain "X2" objectives, which establish allowable salinity levels in the Delta expressed as the distance in kilometers from the Golden Gate Bridge where the salinity concentration reaches two parts per thousand. The purpose of the X2 objective is to regulate the salinity gradient in the Delta between February and June by ensuring that freshwater from the east is sufficient to prevent saltwater intrusion from the west beyond certain locations to protect Delta water quality and beneficial uses. The objective requires that the X2 line must remain downstream of Collinsville in the Delta, and downstream of other locations on a certain number of days each month from February through June. Depending on annual hydrological conditions, SWP operations, including exports, may be limited or curtailed to retain freshwater in the Delta and to meet applicable X2 objectives.

The WQCP and D-1641 also establish an export/inflow (E/I) ratio that affects SWP reliability to provide protection for fish and wildlife beneficial uses in the Delta. The E/I ratio limits the fraction of Delta inflows that may be exported when other WQCP and D-1641 restrictions are not in effect. In general, the E/I ratio limits Delta exports to 35 percent of total Delta inflow from February through June and 65 percent of inflow from July through January.

Several Delta planning and improvement efforts have been initiated to facilitate the protection of Delta habitats and the reliability of SWP and other water supplies, including the Delta Plan, the Bay Delta Conservation Plan, and the Delta Risk Management Strategy, as discussed further below.

Delta Plan

In 2009, California enacted the Delta Reform Act of 2009, which created the Delta Stewardship Council. The purpose of the Act is to achieve the "coequal goals" of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem (*California Water Code,* Section 85054). A final Delta Plan was adopted by the Council on May 16, 2013, which includes 14 regulatory policies and 73 recommendations.

The State Office of Administrative Law approved regulations to implement the Delta Plan regulatory policies on September 1, 2013. The Plan's policies and recommendations include the following:

- Requiring Delta water users to certify in water management plans that all feasible efforts to use water efficiently and that efforts to develop additional local and regional water supplies are being implemented.
- Reserving six high-priority areas for habitat restoration.
- Protecting agricultural land by requiring developers to locate new residential, commercial, or industrial development in areas planned for urban use.
- Requiring State and local agencies to locate, when feasible, water management facilities, ecosystem projects, and flood-management infrastructure in ways that would reduce or avoid conflicts with agriculture and other existing planned uses and requiring those agencies to consider locating the facilities on public land before using private land.
- Prohibiting encroachment on floodways and floodplains.
- Requiring developers of new residential subdivisions to include a level of flood protection that anticipates sea levels rising due to climate change.
- Setting priorities for State investment in Delta flood levees.
- Updating statewide water-use efficiency goals and groundwater management plans for areas using Delta water; streamlining water transfer procedures; and developing a statewide system for reporting how much water is used.
- Having the SWRCB update water quality objectives for the Sacramento and San Joaquin Rivers; controlling or reducing other Delta stressors such as contaminants and invasive species; expanding floodplains and riparian habitats; and locating habitat restoration to accommodate sea-level rise.
- Encouraging agritourism, wildlife-friendly farming practices, and recreational opportunities in the Delta.
- Creating a Delta Flood Risk Management District to provide adequate funding for flood control and emergency preparedness.

In 2014, the Delta Stewardship Council launched a Delta Levees Investment Strategy to identify funding priorities and assemble a comprehensive investment strategy for maintaining Delta levees that protect water quality from seawater intrusion and to provide flood control. The investment strategy will be developed in collaboration with State agencies, local reclamation districts, Delta landowners and businesses, and other important stakeholders.

Bay Delta Conservation Plan (BDCP) and Cal WaterFix

The Bay Delta Conservation Plan (BDCP) is a comprehensive plan prepared by local water agencies, environmental and conservation organizations, State and federal agencies, and other stakeholders to implement a suite of habitat restoration measures, other Delta water quality and habitat stressor reduction activities, and water operations criteria that will facilitate the issuance of long-term permits to operate the SWP and other projects and water operations in the Delta. As defined in Section 85053 of the *California Water Code*, the BDCP is a multispecies conservation plan that is being developed to allow for the issuance of a habitat conservation plan (HCP) under the FESA and a Natural Communities Conservation Plan (NCCP) that will provide CESA incidental take coverage.

The BDCP has been in development since 2006. A draft BDCP and a joint environmental impact report and environmental impact statement (EIR/EIS) in accordance with CEQA and the National Environmental Policy Act (NEPA) were released for public review in late 2013. The lead agencies for the project are the DWR and the U.S. Bureau of Reclamation (Reclamation). Public comments were received through mid-2014. A Partially Recirculated Draft EIR/EIS (RDEIR/SDEIS) was made available for public review and comment from July 10, 2015, to October 30, 2015. The RDEIR/SDEIS was prepared to review engineering refinements made to the proposed water conveyance facilities; to consider additional subalternatives; and to update the environmental analysis in response to issues raised in more than 12,000 comments received on the 2013 EIR/EIS. The RDEIR/SDEIS includes a new Alternative 4A, which the lead agencies have identified as the CEQA and NEPA preferred alternative. Alternative 4A includes three new intakes along the Sacramento River and dual-bore tunnels to convey water to existing state and federal pumping facilities; it also includes habitat restoration measures and other environmental commitments necessary to comply with state and federal environmental law such as the FESA and CESA.

In December 2016 the lead agencies released a Final EIR/EIS for the project, which was renamed the "BDCP/California WaterFix", in part to reflect the decision to obtain FESA coverage under Section 7 rather than Section 10 of the Act. Certain delta restoration projects were also separated from the proposed conveyance system improvements. The preferred project alternative (the "California WaterFix") in the Final EIR/EIS is Alternative 4A, which retains the three new intakes along the Sacramento River and dual-bore tunnels extending south to the delta export pumping facilities. The Final EIR/EIS describes project alternatives; discusses potential environmental impacts; and identifies mitigation measures that would help avoid or minimize impacts. It also provides responses to all substantive comments received on the 2013 EIR/EIS and 2015 RDEIR/SDEIS. As of January 2017, a Record of Decision under NEPA by Reclamation and certification of the EIR and final decision-making under the CEQA by DWR remained pending. No final decision will be made to implement the Cal WaterFix until the CEQA and NEPA review process is complete.

Delta Risk Management Strategy

The Delta includes over 1,100 miles of levees that surround approximately 700,000 acres of lowlands (many of which are constructed) and artificial islands located throughout the estuary. Levee construction began approximately 150 years ago to prevent flooding on farmland in the region. In the 1860s, gold miners upstream from the Delta used high-pressure water jets to wash significant volumes of soil and rock into local streams and rivers. The resulting silt and debris accumulated in the Delta, raised riverbed elevations, and stimulated levee construction along the affected river channels to keep water velocity high and scour away mining-related sediment. The levee system, however, continually erodes the levee faces exposed to the constrained rivers while the accumulated peat soils protected behind levees contract over time as they dry. Many of the Delta islands and other lowlands behind levees are now 20 feet below sea level. Due to these factors, the Delta levee system is increasingly vulnerable to failure caused by storms; earthquakes; and water, wind, and animal-generated erosion. Levee failures allow seawater to intrude east into the Delta and put at risk major highways, railroad lines, water supply and energy pipelines and other infrastructure in the Delta, including the SWP facilities (DWR 2008)

In 2005, the *California Water Code* was amended to require the DWR to evaluate the potential impacts on Delta water supplies associated with continued land subsidence, earthquakes, floods, and climate change over 50-, 100-, and 200-year projection periods and to identify measures to reduce identified risks. In response, the DWR initiated a two-phase Delta Risk Management Strategy (DRMS). DRMS Phase 1 evaluated the risks associated with levee failures and was completed in a 2008 report to the legislature. The Phase 2 report for the DRMS, issued in June 2011, evaluated alternatives to reduce the risk to the Delta and adverse consequences from levee failure. The Phase 2 report identified several potential levee improvements and evaluated the extent to which these improvements would reduce the consequences of potential levee failures in four scenarios.

The Metropolitan Water District of Southern California, the largest SWP contractor, also conducted levee risk analyses indicating that water exports could be resumed after a major levee failure in the Delta by placing structural barriers at certain channel locations to create an emergency freshwater conveyance “pathway” to SWP and other water project pumping facilities. After the Phase 2 report was issued, a Delta Knowledge Improvement Program (DKIP) was implemented to further refine the DRMS studies, including complete bathymetry surveys of the Delta. Other DKIP projects include an economic study to assist the Delta Stewardship Council in developing a comprehensive investment strategy for the Delta levees; a feasibility study for the implementation of a potential delta flood risk management assessment district; and peat soil seismic loading and setback levee design studies to enhance stability and improve habitats.

Climate Change and Sea Level Rise

According to the most recent California Water Plan Update 2013, climate change may increase water supply uncertainties, including the reliability of SWP deliveries, by affecting the frequency, magnitude, and duration of extreme storm events and by reducing annual snowpack storage (DWR 2014). Rising sea levels would also increase the risk of coastal flooding, Delta levee integrity, and water quality. Adverse changes in Delta water quality due to sea level rise, levee failures, more frequent and intense rainfall patterns and droughts could further constrain SWP exports. Potential climate change impacts to SWP delivery reliability were evaluated in the DCR and are discussed in more detail in the following section.

State Water Project Delivery Capability and Reliability

The DWR estimates the average or normal year, single-dry year and multiple-dry year SWP delivery reliability under current and projected future conditions every two years. The most recent estimates are provided in the 2015 DCR. To evaluate SWP delivery volumes under future conditions, the DCR uses a computer model that incorporates the historic range of hydrologic conditions, including precipitation and runoff that occurred during the 82-year period from 1922 through 2003. The model allows for the adjustment of historic hydrologic condition to account for land-use changes, export limitations required to meet regulatory objectives, potential climate change effects and other factors over a range of relatively wet to critically dry years. The volume of water that the SWP is projected to deliver each year is compared with the maximum delivery capacity of the system from the Delta, which the DWR estimates to be approximately 4.132 million afy (CNRA 2015). The results of the 82-year analysis are used to derive the percentage of maximum SWP capacity that would be delivered for the following scenarios: (1) on average, over the 82-year analysis period; (2) during a single-dry year; and (3) during multiple-dry years (droughts). The DCR also calculates the annual percentage and volume of each contractor's Table A Amount that would be delivered over the 82-year analysis period.

The DCR includes five scenarios for future water delivery up to 2035. The "base scenario" analyzes the percentage of total demand that the SWP could deliver in average, single-dry, and multiple-dry years under 2015 regulatory, climate change, and SWP conveyance and other facility conditions. The base scenario is the only scenario used by the DWR to discuss future SWP reliability in the main body of the DCR.

Four alternative scenarios were included in the DCR appendices:

- An "early long-term" (ELT) scenario with generally similar operational assumptions as the DCR base scenario, but with additional and more aggressive climate change impacts, including 2025 emission levels and an assumed sea level rise of 6 inches (15 centimeters).
- An "existing conveyance high outflow" (ECHO) scenario that includes the climate change assumptions in the ELT scenario and also focuses on the potential impacts of additional water quality regulatory requirements that would further limit SWP

exports to maintain Delta flows, including certain south Delta operating restrictions and fall X2 and enhanced spring outflow requirements.

- An "existing conveyance low outflow" (ECLO) scenario that is based on the ECHO scenario, but without the implementation of fall X2 and enhanced spring outflow requirements.
- A "BDCP" scenario that analyzes the potential future delivery reliability of the SWP system assuming the climate change conditions in the ELT scenario plus the construction of an isolated facility with a 9,000 cubic feet per second (cfs) diversion capacity near Hood; the adoption of certain north and south Delta intake operation criteria; new Fremont Weir, control gates, and Yolo Bypass inundation criteria; additional Rio Vista minimum flow criteria; certain south Delta operating restrictions; up to 10,300 cfs capacity at the SWP south Delta pumping facilities; and the implementation of fall X2, but not enhanced spring outflow requirements.

DCR Appendices C through F provide 82-year model results for the ELT, ECLO, ECHO, and BDCP scenarios for each of the SWP contractors, including AVEK. The ELT scenario incorporates more significant assumptions regarding potential climate change impacts than used in the base scenario, including 2025 emission levels and a 15-centimeter sea level rise. These assumptions could increase the Delta's salinity levels and constrain future SWP exports to a greater extent than the climate change factors assumed in the DCR base scenario. The average year SWP delivery rate in the ELT scenario is also lower than the base scenario rate and represents a reasonable middle range between the BDCP and base scenario average year delivery percentages, which are higher than, and the ECLO and ECHO scenarios, which are lower than, in the ELT scenario.

As discussed in Section 5.18.6, the Project supplies include SWP water imported by AVEK and delivered within the Agency's service area and SWP supplies purchased by TRC, transferred to AVEK and imported by AVEK for Project use under an agreement with TRC. The AVEK 2015 UWMP utilizes the ELT scenario developed for the Agency by the DWR to provide a more conservative assessment of SWP delivery reliability than the DCR base scenario. AVEK also reduced the ELT scenario single-dry year reliability rate to 5 percent, the 2014 delivery level that was the lowest in the Agency's history to date. The analysis in Section 5.18.6 uses the same reliability factors developed from the ELT scenario in the AVEK 2015 UWMP, including the delivery of 59 percent of Table A amounts in a normal or average year; 5 percent of Table A amounts in a single-dry year; and 12 percent, 16 percent, and 24 percent of Table A amounts in a multiple-dry year period (AVEK 2016).

Antelope Valley Regional Supply and Demand Projections

The AVEK 2015 UWMP (AVEK 2016) and the AVIRWMP (RWMG 2013) are discussed in this section to provide regional background information based on the most recently available water planning documents that consider existing and future regional water demands and supplies. The AVIRWMP was also utilized in the 2014 and 2015 AVAP and General Plan update CEQA analyses prepared by the County to analyze Antelope Valley regional water demand and supplies.

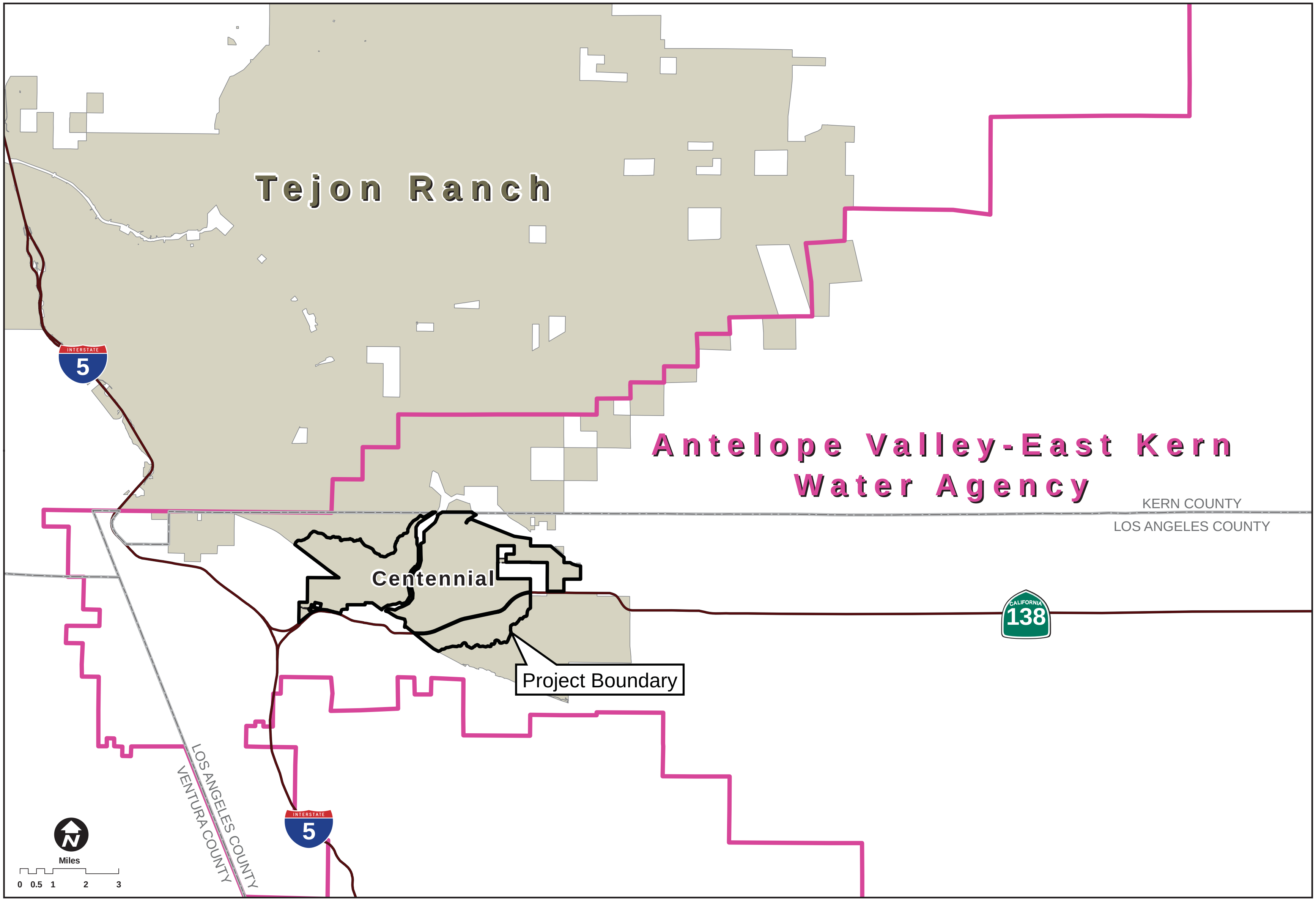
State Water Project Deliveries to the Antelope Valley – East Kern County Water Agency (AVEK)

The Project is located within the existing AVEK service area, and AVEK is the only SWP contractor in the Antelope Valley that would provide imported water for Project use. Exhibit 5.18-6, Project Site and Tejon Ranch Company Land Ownership within the AVEK Service Area, depicts the Project site and TRC lands in the context of the AVEK service area. AVEK is a wholesale supplier of SWP water to the Antelope Valley region; they have a service area of nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties and a small portion of Ventura County. AVEK has a contract with the DWR to receive up to 144,844 acre-feet per year of SWP water. Based on the ELT delivery reliability scenario in the DCR, the Agency's average year supply would be 85,460 acre-feet (59 percent) of the SWP contract amount. In 2015, the AVEK service area had a population of 359,500 Antelope Valley residents (AVEK 2016).

Under the Antelope Valley Adjudication Judgment and Physical Solution, AVEK has an overlying pre-rampdown production right of 4,000 acre-feet per year (afy) and an overlying production right of 3,550 afy at the end of the 7-year production rampdown period. The Judgment and Physical Solution also provides AVEK with the right to produce an amount of imported water return flows in any year equal to 34 percent of agricultural imported water use and 39 percent of municipal and industrial imported water use multiplied by the average amount of imported water used by AVEK in the preceding 5-year period. The 2015 UWMP conservatively assumes that AVEK's annual supply of groundwater is 3,550 afy and does not include return flows that also may be available to the Agency (AVEK 2016).

AVEK has developed groundwater banking programs to increase the reliability of the Antelope Valley region's water supplies by storing excess water available from the SWP during wet periods and recovering these supplies for delivery to customers during dry and high demand periods or in the event the SWP system is disrupted. AVEK's Water Supply Stabilization Project No. 2 (Westside Water Bank) started operations in 2010, and currently includes approximately 400 acres of groundwater recharge basins and 9 groundwater recovery wells. Up to 20 new wells may be constructed as a part of the Westside Water Bank project. Five irrigation wells existing on the property at the time of development may also be used in the program. AVEK meters the water delivery and recovery amounts for the banking program and will not recover more than 90 percent of the amount recharged to account for evapotranspiration, other losses during recharge and conveyance, and metering accuracy. The Eastside Water Banking and Blending Project started operations in 2016 and includes three 2-acre recharge basins and three groundwater wells. The project allows for recharge of raw water that is later recovered and blended for delivery to the Eastside Water Treatment Plant (AVEK 2015).

The maximum recharge and recovery volumes for the Westside Water Bank are estimated to be approximately 36,000 afy. AVEK can also recover groundwater from the Eastside Water Bank (5,700 afy total estimated capacity) and from 3 potable groundwater wells in the Bench Ranch Well Field (total capacity of about 3,700 afy). The 2015 UWMP projects that AVEK will recover up to 36,000 afy from groundwater banking facilities during single-dry and multiple-dry years (AVEK 2016).



Source: GVMWD 2011; Bonterra Psomas 2015

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Project Site and Tejon Ranch Company Land Ownership within the AVEK Service Area

Exhibit 5.18-6

Centennial Project

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AVEK operates four water treatment plants (WTPs). The Quartz Hill WTP is capable of producing 90 million gallons per day (mgd) or 270 acre-feet per day (afd) of treated Aqueduct water. The Eastside WTP is capable of producing 10 mgd (30 afd). The Rosamond WTP can produce 14 mgd (42 afd), and the Acton WTP can produce 4 mgd (12 afd) of treated water. AVEK does not provide supplemental treatment for recycled water and does not distribute recycled water. The bulk of AVEK's imported water is treated and distributed by water purveyors to customers throughout the Agency's service area. AVEK also provides untreated SWP water to local farmers and ranchers. All of the Project land, and more than 38,000 acres of land owned by TRC, are located within AVEK's jurisdictional boundaries and have been subject to AVEK assessments for several decades.

Consistent with *California Water Code* requirements, the 2015 UWMP provides population growth, water supply, and water demand projections through 2035 for AVEK. The analysis anticipates that the Agency's service area population will be 460,700, an increase of approximately 101,200 from 2015 (AVEK 2016). The 2015 UWMP estimates that AVEK's 2035 average year water supplies will be 89,010 afy, including 85,460 afy of SWP deliveries and 3,550 afy of groundwater produced in accordance with the Judgment and Physical Solution. AVEK's 2035 average year demand is estimated to be 86,250 afy, resulting in an average year surplus supply of approximately 2,760 acre-feet by 2035. The 2015 UWMP anticipates that AVEK's SWP deliveries, groundwater, and recovered banked water supplies will be less than demand during dry and multiple-dry years. The single-dry year shortfall in 2035 is estimated to be 39,500 acre-feet, and the maximum multiple-dry year period shortfall is estimated to be 29,300 acre-feet (AVEK 2016). Since AVEK provides a supplemental water supply to retail agencies, the UWMP anticipates that the supply difference in single-dry and multiple-dry years will be met by increased groundwater pumping (recovery of banked supplies or return flows), use of recycled water, and/or reductions in demand by the retail agencies and other Agency customers, such as the Project. As discussed below, the Project will be served by two water banks and will generate and use recycled water in a manner that will ensure single-dry and multiple-dry year water supply reliability in the Project area consistent with the Agency's UWMP.

2013 Antelope Valley Integrated Regional Water Management Plan

An integrated regional water management planning process has been conducted for several years in the Antelope Valley, and an integrated plan was first published in 2007 by an 11-member regional water management group. The AVIRWMP was most recently updated in 2013 and provides an analysis of average year, single-dry year, and multiple-dry year regional supply and demand conditions through 2035 (RWMG 2013). The AVIRWMP projections assume that the region's population will increase by about 157,000 residents from 2010 to 2035. Table 5.18-1 summarizes the population growth estimates used in the AVIRWMP projections.

TABLE 5.18-1
ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN POPULATION PROJECTIONS

	1970[a]	1980[a]	1990[b]	2000[c]	2010[d]	2020[e]	2035[e]
Boron	3,000	3,000	3,000	2,000	2,000	2,000	3,000
California City[f]	0	0	0	0	0	0	0
Edwards AFB	10,000	9,000	7,000	7,000	4,000	5,000	5,000
Mojave	4,000	5,000	4,000	4,000	4,000	5,000	5,000
North Edwards	N/A	N/A	N/A	1,000	1,000	1,000	1,000
Rosamond	4,000	5,000	7,000	14,000	17,000	20,000	23,000
Unincorporated Kern County	1,000	2,000	6,000	2,000	3,000	3,000	4,000
Lake Los Angeles	N/A	N/A	8,000	12,000	12,000	14,000	16,000
Lancaster	41,000	51,000	97,000	119,000	150,000	175,000	201,000
Littlerock	N/A	N/A	N/A	1,000	1,000	1,000	1,000
Palmdale	17,000	22,000	68,000	117,000	146,000	179,000	206,000
Quartz Hill	5,000	7,000	10,000	10,000	11,000	13,000	15,000
Sun Village	N/A	N/A	N/A	N/A	12,000	14,000	16,000
Unincorporated Los Angeles County	15,000	22,000	46,000	33,000[g]	25,000	29,000	34,000
Antelope Valley Region	**103,000**	**128,000**	**275,000**	**346,000**	**390,000**	**465,000**	**547,000**

AFB: Air Force Base; N/A: not applicable; SCAG: Southern California Association of Governments; RTP: Regional Transportation Plan

Note: Projections Rounded to the nearest 1,000 people.

a Based on Geolytics Normalization of Past U.S. Census Tract Data to 2000 Census Tract Boundaries.
b Based on 1990 Census data, and normalized by percentage of area of Census Block Group or Census Place in the Region.
c Based on 2000 Census data, and normalized by percentage of area of Census Block Group or Census Place in the Region.
d Based on 2010 Census data, and normalized by percentage of area of Census Block Group or Census Place in the Region.
e Projections for Palmdale and Lancaster from the SCAG Adopted 2012 RTP Growth Forecast. For remaining areas, it is assumed the Antelope Valley Region would have a similar annual growth rate as the City of Lancaster, estimated as approximately 1.7 percent per year up to 2020, then 1.0% per year up to 2035.
f The portion of California City in the Antelope Valley Region has a population of less than 500 people, and therefore is rounded down to 0.
g The decrease in population in unincorporated Los Angeles County is likely due to the addition of Census Designated Places to the census County that had previously been counted as unincorporated area.

Source: RWMG 2013 (Table 2-3).

Tables 5.18-2 through 5.18-4 summarize the average year, single-dry year, and multiple-dry year supply and demand projections in the AVIRWMP for 2010–2035. The projections assume that urban demand will rise from 87,000 afy in 2010 to 118,000 afy in 2035. Agricultural demand is assumed to be 92,000 afy in an average year and 98,000 afy in single-dry and multiple-dry years. Using these assumptions, the AVIRWMP indicates that, by 2035, the region's water supplies would be sufficient to meet demands in an average year (Table 5.18-2). Demand would exceed supply by approximately 61,200 afy in a single-dry year (Table 5.18-3) and by approximately 41,200 afy during a multiple-dry year drought (Table 5.18-4).

TABLE 5.18-2
ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN PROJECTED WATER SUPPLY AND DEMAND (ACRE-FEET) COMPARISON FOR AN AVERAGE WATER YEAR

	2010	2015	2020	2025	2030	2035
Supplies						
Groundwater, Total Safe Yield	110,000	110,000	110,000	110,000	110,000	110,000
WSSP-2 Extractions[a]	2,000	600	600	600	600	600
Subsurface Flow Loss	0	0	0	0	0	0
Direct Deliveries (AVEK, PWD, and LCID SWP Deliveries)	96,100	95,900	95,900	95,900	95,900	95,900
Recycle/Reuse[b]	82	82	82	82	82	82
Surface Deliveries (local reservoirs)	4,000	4,000	4,000	4,000	4,000	4,000
Total Supply	**212,200**	**210,600**	**210,600**	**210,600**	**210,600**	**210,600**
Demands[c]						
Urban Demand	87,000	95,000	103,000	108,000	113,000	118,000
Agriculture Demand	92,000	92,000	92,000	92,000	92,000	92,000
Total Demand	**179,000**	**187,000**	**195,000**	**200,000**	**205,000**	**210,000**
Supply and Demand Difference	*33,200*	*23,600*	*15,600*	*10,600*	*5,600*	*600*

AVIRWMP: Antelope Valley Integrated Water Management Plan; af: acre-feet; WSSP-2: Water Supply Stabilization Project No. 2; AVEK: Antelope Valley – East Kern Water Agency; PWD: Palmdale Water District; LCID: Little Creek Irrigation District; SWP: State Water Project; M&I: municipal and industrial

Notes: Totals are rounded to the nearest 100.

[a] Assumes small withdrawals from WSSP-2 will occur to overcome conveyance constraints and enable utilization of 60%–61% of AVEK Table A (SWP reliability estimate). See explanation in Section 3.1.2 of the AVIRWMP.
[b] Recycled water demands for 2010–2035 reflect existing 2013 M&I demands (i.e., Division Street Corridor and McAdam Park).
[c] Demand includes groundwater extractions.

Source: RWMG 2013 (Table 3-14).

TABLE 5.18-3
ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN PROJECTED WATER SUPPLY AND DEMAND (ACRE-FEET) COMPARISON FOR A SINGLE-DRY WATER YEAR

	2010	2015	2020	2025	2030	2035
Supplies						
Groundwater, Total Safe Yield	110,000	110,000	110,000	110,000	110,000	110,000
WSSP-2 Extractions[a]	0	23,000	23,000	23,000	23,000	23,000
Subsurface Flow Loss	0	0	0	0	0	0
Direct Deliveries (AVEK, PWD, and LCID SWP Deliveries)	14,500	17,700	17,700	17,700	17,700	17,700
Recycle/Reuse[b]	82	82	82	82	82	82
Surface Deliveries (local reservoirs)	4,000	4,000	4,000	4,000	4,000	4,000
Total Supply	**128,600**	**154,800**	**154,800**	**154,800**	**154,800**	**154,800**
Demands[c]						
Urban Demand	87,000	95,000	103,000	108,000	113,000	118,000
Agriculture Demand	98,000	98,000	98,000	98,000	98,000	98,000
Total Demand	**185,000**	**193,000**	**201,000**	**206,000**	**211,000**	**216,000**
Supply and Demand Difference	*(56,400)*	*(38,200)*	*(46,200)*	*(51,200)*	*(56,200)*	*(61,200)*

AVIRWMP: Antelope Valley Integrated Water Management Plan; af: acre-feet; WSSP-2: Water Supply Stabilization Project No. 2; AVEK: Antelope Valley – East Kern Water Agency; PWD: Palmdale Water District; LCID: Little Creek Irrigation District; SWP: State Water Project; M&I: municipal and industrial

Note: Totals are rounded to the nearest 100.

a Assumes periodic wet years have occurred to allow quantities of SWP deliveries above AVEK demands to fill the water bank.
b Recycled water demands for 2010–2035 reflect existing 2013 M&I demands (i.e., Division Street Corridor and McAdam Park).
c Demand includes groundwater extractions.

Source: RWMG 2013 (Table 3-15).

**TABLE 5.18-4
ANTELOPE VALLEY INTEGRATED REGIONAL
WATER MANAGEMENT PLAN PROJECTED WATER
SUPPLY AND DEMAND (ACRE-FEET) COMPARISON FOR
A MULTIPLE-DRY WATER YEAR**

	2010	2015	2020	2025	2030	2035
Supplies						
Groundwater, Total Safe Yield	110,000	110,000	110,000	110,000	110,000	110,000
WSSP-2 Extractions[a]	0	6,000	6,000	6,000	6,000	6,000
Subsurface Flow Loss	0	0	0	0	0	0
Direct Deliveries (AVEK, PWD and LCID SWP Deliveries)	56,300	54,700	54,700	54,700	54,700	54,700
Recycle/Reuse[b]	82	82	82	82	82	82
Surface Deliveries (local reservoirs)	4,000	4,000	4,000	4,000	4,000	4,000
Total Supply	**170,400**	**174,800**	**174,800**	**174,800**	**174,800**	**174,800**
Demands[c]						
Urban Demand	87,000	95,000	103,000	108,000	113,000	118,000
Agriculture Demand	98,000	98,000	98,000	98,000	98,000	98,000
Total Demand	**185,000**	**193,000**	**201,000**	**206,000**	**211,000**	**216,000**
Supply and Demand Difference	*(14,600)*	*(18,200)*	*(26,200)*	*(31,200)*	*(36,200)*	*(41,200)*

AVIRWMP: Antelope Valley Integrated Water Management Plan; af: acre-feet; WSSP-2: Water Supply Stabilization Project No. 2; AVEK: Antelope Valley – East Kern Water Agency; PWD: Palmdale Water District; LCID: Little Creek Irrigation District; SWP: State Water Project; afy: acre-feet per year; M&I: municipal and industrial

Note: Values assume 4-year dry period begins in the year shown and totals are rounded to the nearest 100.

[a] Assumes periodic wet years have occurred to allow quantities of SWP deliveries above AVEK demands to fill the water bank. Full bank storage is evenly distributed over the 4-year dry period, rounding to about 6,000 afy each year.
[b] Recycled water demands for 2010–2035 reflect existing 2013 M&I demands (i.e., Division Street Corridor and McAdam Park).
[c] Demand includes groundwater extractions.

Source: RWMG 2013 (Table 3-16).

Table 5.18-5 summarizes the 2010 per capita urban water use estimated in the AVIRWMP for the portions of the AVEK service area not supplied by another large retail purveyor and for other large water purveyors in the Antelope Valley. The estimates range from 280 gallons per capita per day (gpcd) in the QHWD to 152 gpcd in the RCSD. For information purposes, Table 5.18-5 also calculates the urban gpcd levels that would correspond with a ten percent reduction from the 2010 estimates. As discussed above, in 2009, the California legislature amended the *California Water Code* to require a 20 percent reduction in per capita urban water use by 2020. In addition, in 2016, five California resource agencies published a framework report for implementing Executive Order B-37-16 include an initial residential standard of 55 gpcd (DWR et al. 2016b). The AVIRWMP states that, regardless of whether a water agency achieves the 20 percent reductions mandated by State law, all purveyors are required to design and implement water conservation programs to further reduce per capita consumption. With the implementation of these programs, it is expected that the average per capita water use in the Antelope Valley region will decrease (RWMG 2013). The 10 percent reduction from 2010 levels shown in Table 5.18-5 indicates potential levels of regional water demand assuming only a 10 percent reduction and residential water use, in most instances, above 55 gpcd.

TABLE 5.18-5
ANTELOPE VALLEY INTEGRATED REGIONAL
WATER MANAGEMENT PLAN ESTIMATED 2010 PER CAPITA
URBAN WATER USE IN THE ANTELOPE VALLEY

	2010 Population	2010 Urban Water Use	2010 afy/person	2010 gpcd levels[f]	10% reduction from 2010 gpcd levels[f]
AVEK (excluding purveyors)[a]	84,000	15,000	0.181	162	145
LCID[b]	3,000	1,000	0.310	277	249
LACWWD40[c]	172,000	46,000	0.265	237	213
PWD[d]	109,000	20,000	0.181	162	145
QHWD[d]	18,000	6,000	0.314	280	252
RCSD[d]	18,000	3,000	0.170	152	137
Antelope Valley Region[e]	403,000	90,000	0.223	199	179

AVIRWMP: Antelope Valley Integrated Water Management Plan; afy: acre-feet per year; gpcd: gallons per capita per day; AVEK: Antelope Valley – East Kern Water Agency; LCID: Littlerock Creek Irrigation District; LACWWD40: Los Angeles County Waterworks District No. 40; PWD; Palmdale Water District; QHWD: Quartz Hill Water District; RCSD: Rosamond Community Services District; UWMP: Urban Water Management Plan; CDPH: California Department of Public Health

Note: All numbers rounded to the nearest 1,000. Numbers do not include private well owners. It is assumed that the demand and population numbers reported in the UWMPs provide an approximate per capita estimate for the Region.

[a] As determined from data in the AVEK's 2010 UWMP. Values exclude population and demand numbers for LCID, LACWWD40, PWD, QHWD, and RCSD that fall inside the AVEK service area.
[b] Values exclude LCID agricultural demand. Demand verified by personal communication with Brad Bones at LCID on August 21, 2013. Population sizes from the Annual CDPH Drinking Water Program Report.
[c] Population size from the Annual CDPH Drinking Water Program Report. Water demand is based on values from the Antelope Valley 2010 Integrated UWMP (which is based on land use).
[d] Based on values provided in the 2010 UWMPs and 2009 actual water use.
[e] Antelope Valley Region per capita water use was determined by dividing total water demand by total population. These numbers do not include private well owners. Values in the Antelope Valley Region row may differ from the sum of district information due to rounding errors.
[f] Gallons per capita per day estimated by using afy per person reported in the AVIRWMP's Table 3-4. The afy per person estimates for specific purveyors in the AVIRWMP vary slightly from the amounts derived by dividing the reported service area population by water use. For consistency, the AVIRWMP values are used to estimate gpcd levels. Potential gpcd rates reflecting a 10% reduction from estimated 2010 gpcd levels are included for informational purposes.

Source: RWMG 2013 (Table 3-4).

The AVIRWMP indicates that conservation measures could substantially reduce the supply and demand projections for the 2015–2035 period. The plan states that aggressive conservation could reduce urban water demands by ten percent by 2035 (RWMG 2013). Significant water conservation was achieved in the Antelope Valley during the recent drought. In 2015, for example, LACWWD40 water use was 165 gpcd, which is substantially below the 2010 level of 237 gpcd estimated in the AVIRWMP and the District's 5-year baseline (2003–2007) average use of 267 gpcd (LACWWD40 2017).

The AVIRWMP also discusses other water sources potentially available to the region, including Table A transfers from other SWP contractors; SWP Article 21 water; transfers from the Central Valley Project (CVP) system operated by the U.S. Bureau of Reclamation (USBR); transfers from other water rights holders in the Sacramento Valley; treated storm water captured and recharged into the ground; and desalinated water. Potential additional supplies identified in the AVIRWMP are briefly discussed below.

- **State Water Project Table A Transfers.** Certain SWP contractors, or their member agencies or subcontractors, hold a contractual right to SWP Table A Amounts and are required to make substantial annual payments to maintain these amounts regardless of whether SWP water is actually requested or delivered. SWP participants may desire to reduce these fixed costs by selling excess Table A Amounts to other users. As discussed in Section 5.18.6, approximately 3,444 afy of Table A Amounts were purchased from Central Valley water districts for Project use. Other potential Table A transfer opportunities for the Antelope Valley are reasonably likely to become available in the future.
- **Article 21 Water.** As discussed above, SWP Article 21 water is made available on an unscheduled and interruptible basis under Article 21 of the SWP contracts and is typically available only in average to wet years for a limited time in winter months. Although the development of local banking operations, including the Water Supply Stabilization Project No. 2 (WSSP-2) operated by AVEK, could increase the potential utility of Article 21 water for use in the Antelope Valley region, the AVIRWMP indicates that Article 21 water is not considered a long-term reliable supply (RWMG 2013).
- **Central Valley Project Water.** CVP supplies, if available, would be transported by AVEK via the SWP conveyance facilities on a low-priority basis and would be less reliable than SWP supplies. Like SWP supplies, CVP supplies are constrained by Delta species, water quality, and export system management issues. The transfer of CVP water from agricultural to urban use could also generate socioeconomic impacts, and most CVP contractor supplies have already been allocated for other uses, including environmental restoration projects. Consequently, the AVIRWMP indicates that CVP water is not available for long-term, reliable sale or exchange that would facilitate use in the Antelope Valley (RWMG 2013).

The General Plan Update EIR utilized the AVIRWMP 2035 regional supply estimate of 210,600 afy and estimated the incremental demand growth associated with General Plan implementation by assuming that the urban water demand would be approximately 142 gpcd in 2035 (DRP 2015c, Table 5.18-17). Based on this demand level and the higher amount of population growth anticipated prior to the adoption of the AVAP Update, the General Plan Update Draft EIR estimates that implementation of the General Plan would result urban demand of approximately 170,400 afy in unincorporated Antelope Valley. The General Plan Update EIR concludes that, even with the planned future water supplies under consideration by Antelope Valley water agencies, water supplies in the Antelope Valley planning area would not be adequate to serve anticipated demand from growth and that impacts on Antelope Valley water supplies as a result of General Plan implementation would be significant and unavoidable (DRP 2015c).

The General Plan Update Final EIR states that the Los Angeles County Board of Supervisors adopted the AVAP Update after the General Plan Update Draft EIR was prepared and that the AVAP update was consistent with the buildout projections identified in the Antelope Valley Reduced Intensity Alternative in the General Plan Update Draft EIR. The buildout levels that would result from the implementation of the AVAP update are substantially lower than under the previous version of the County General Plan. As approved, the AVAP update would result in a plan buildout total of 106,180 dwelling units, a 405,410 resident population, 134,351 employees, and a jobs/housing ratio of 1.3 compared with the prior General Plan buildout of 278,158 dwelling units, 1,070,571 population, 51,219 employees and a jobs/housing ratio of 0.18. The Final EIR for the AVAP update utilized the AVIRWMP average Antelope Valley estimate of per capita water use (199 gpcd) to evaluate the water demand growth that could occur from implementing the plan. The General Plan Update Final EIR determined that the lower residential and related development associated with the AVAP update would reduce future water demand, but that the plan's water supply impacts would nevertheless remain significant and unavoidable (DRP 2015c).

Water Quality

Groundwater Quality

Groundwater quality in the Antelope Valley Region is excellent within the principal aquifer but degrades toward the northern portion of the dry lakes areas. Groundwater is typically characterized by calcium bicarbonate near the surrounding mountains and is characterized by sodium bicarbonate or sodium sulfate in the central part of the basin. In the eastern part of the basin, the upper aquifer has sodium-calcium bicarbonate type water and the lower aquifer has sodium bicarbonate type water. The water in the principal aquifer has a total dissolved solid (TDS) concentration ranging from 200 to 800 milligrams per liter (mg/L) and is considered to be generally suitable for domestic, agricultural, and industrial uses. The deep aquifer typically has a higher TDS level. Hardness ranges from 50 to 200 mg/L, and high fluoride, boron, nitrates, chromium, and antimony are a problem in some areas of the basin. The groundwater in the basin is used for both agricultural and municipal and industrial (M&I) purposes (RWMG 2013).

Arsenic is closely monitored in the Antelope Valley region; it is a naturally occurring inorganic contaminant that is often found in groundwater and is occasionally found in surface water. Anthropogenic sources of arsenic include agricultural, industrial, and mining activities. Arsenic can be toxic in high concentrations, and is linked to increased risk of cancer when consumed for a lifetime at or above the regulated maximum contaminant level (MCL) of ten parts per billion (ppb). Arsenic levels above the MCL have been observed in the

Antelope Valley region. When detected in wells, local water districts typically blend the affected water with higher-quality supplies to reduce arsenic concentrations (RWMG 2013).

Hexavalent chromium or chromium-6 is also monitored in the Antelope Valley. Chromium-6 can occur in the environment from the erosion of natural chromium deposits, but can also be produced by industrial processes such as chrome plating, dyes and pigments, and leather and wood preservation. In June 2014, California adopted a 0.010 mg/L (10 ppb) MCL for Chromium-6 (SWRCB 2015a).

Other regional water quality concerns include nitrate levels above the current MCL of 45 parts per million (ppm) and high TDS levels in portions of the Antelope Valley Basin. Groundwater monitoring data from the mid-to-late 1990s indicate that nitrate (NO_3) concentrations periodically exceed the primary MCL for drinking water in two wells located in the southern portion of the groundwater basin near the Palmdale Wastewater Reclamation Plant (WRP). Agricultural fertilization practices and discharge of treated wastewater has likely contributed to the elevated levels. Actions have been implemented to address these concerns and to minimize any impact from treated wastewater, including treatment upgrades, a change in effluent management practices, the implementation of a recycled water distribution system, and groundwater remediation activities near the Palmdale WRP site (RWMG 2013).

Imported Water Quality

SWP water quality is continuously monitored by the DWR. Table 3-18 of the AVIRWMP, which summarizes DWR testing data collected from SWP water samples over a two-year period (2010–2012), shows that SWP supplies prior to treatment generally meet or exceed all applicable MCLs. As previously discussed, SWP water is treated by one of four AVEK facilities prior to delivery to the existing water purveyors, including the Quartz Hill Water Treatment Plant (90 million gallons per day [mgd]), the Eastside Water Treatment Plant (10 mgd), the Rosamond Water Treatment Plant (14 mgd), and the Acton Water Treatment Plant (4 mgd). These facilities further ensure that SWP-supplied water achieves all applicable drinking water quality objectives (RWMG 2013).

Recycled Water Quality

Regional infrastructure required to produce and distribute tertiary-treated effluent from the region's three water reclamation plants continues to be developed in the Antelope Valley. The water will be treated to levels suitable for unrestricted reuse, including for irrigating freeway landscapes, parks, schools, senior complexes, and new home developments. The effluent will also meet all Waste Discharge Requirements (WDRs) issued by the Regional Water Quality Control Board for the region. Revised WDRs for the Lancaster WRP were issued in 2009 and in 2011 for the Palmdale WRP. When used to recharge groundwater, recycled water will be blended or subject to additional water quality requirements to protect regional groundwater. TDS and nutrients from recycled water will be managed in conjunction with the adopted 2014 Salt/Nutrient Management Plan for the Antelope Valley.

5.18.4 PROJECT DESIGN FEATURES

PDF 18-1 All indoor appliances and potable and non-potable water distribution and application systems will conform to the water conservation requirements in the *Centennial Specific Plan* and the Centennial Green Development Plan. The Project will meet or exceed the indoor and outdoor residential and non-residential standards in the California Green Building Standards (CALGreen) and County Green Building Standards codes; State Appliance Efficiency Regulations; and State residential and non-residential indoor and outdoor water use standards, including standards that would be adopted under Executive Order B-37-16. All non-construction water use on the Project site will be metered and monitored. The Project Water Purveyor will implement water-based budget rates in conformance with all applicable laws and in a manner consistent with similar rate structures implemented throughout California, including the Irvine Ranch Water District, the Rancho California Water District, the Western Municipal Water District, and the Eastern Municipal Water District.

PDF 18-2 All on-site landscaping and irrigation equipment will conform with the plant palette and irrigation efficiency requirements for specific land uses in Section 3.4 of the *Centennial Specific Plan* to ensure that outdoor water use achieves projected levels and to

- Retain the look and/or feel of a regionally appropriate landscape;
- Minimize changes in soil types and the energy required to irrigate them;
- Minimize irrigated areas; and
- Minimize water demand in irrigated areas.

PDF 18-3 Recycled water treated to *California Code of Regulations* Title 22 unrestricted reuse standards will be produced from on-site treatment facilities and used to meet Project demand and to reduce potable water and maximize recycled water use.

PDF 18-4 Water Use Reports will be prepared and submitted to the County to verify that projected water use efficiencies are being achieved (1) at the end of the 5th year following first occupancy or occupancy of the 4,000th dwelling unit and (2) at the end of the 10th year following first occupancy or occupancy of the 10,000th dwelling unit, whichever occurs later. In the event that a Water Use Report indicates that consumption exceeds projected levels, response measures must be implemented to ensure that available supplies will be sufficient to meet future demand.

5.18.5 THRESHOLD CRITERIA

The following significance threshold criteria are derived from the County of Los Angeles Environmental Checklist. The Project would result in a significant impact if it would:

Threshold 18-1 Have insufficient reliable water supplies available to serve the project demands from existing entitlements and resources, considering existing and projected water demands from other land uses.

Threshold 18-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

5.18.6 ENVIRONMENTAL IMPACTS

Threshold 18-1 **Would the project have sufficient reliable water supplies available to serve the project demands from existing entitlements and resources, considering existing and projected water demands from other land uses?**

On-Site Impacts

The Project has been designed to achieve indoor and outdoor water demand and recycled water use levels that meet or exceed California regulatory requirements, including the CALGreen Code and the State's Appliance Efficiency Regulations; it has also been designed to be consistent with existing water use in the state's more efficient communities. Water demand will be sustainably met by using groundwater; in-basin return flows; recycled water; imported water supplies that have been secured for Project use; service area deliveries from AVEK that have been incorporated into the Agency's UWMP; and imported water stored in water banking facilities in accordance with the adjudication Judgment and Physical Solution. Recycled water produced from on-site wastewater flows will supply approximately 40 percent of demand at Project buildout.

All indoor and outdoor water use will be metered. The metering data will be compiled into Water Use Reports provided to the County after approximately 25 percent and 50 percent of the Project has been built, following first occupancy, to assess the extent to which planned water use efficiencies are being achieved. In the event that a Water Use Report indicates that consumption exceeds projected levels, the Project Water Purveyor must implement response measures to ensure that available supplies will be sufficient to meet future demand. Potential response measures include legally permissible cost-based adjustments to water and wastewater budget-based rates; additional enforcement; water system repairs or equipment upgrades; or obtaining supplemental water supplies. No additional development will be approved until sufficient response measures, if required, have been implemented to the satisfaction of the County.

Consistent with the peer review of the Project's water supply and demand (see Appendix 5.18-G) the Project Water Purveyor will implement water budget-based rates to ensure that applicable water indoor and outdoor water use standards are achieved in a fair and equitable manner (Kennedy/Jenks 2017). Water budget based rates for indoor and outdoor residential, commercial, industrial and other uses have be used throughout California, including the Irvine Ranch Water District (IRWD), the Rancho California Water District, the Eastern Municipal Water District, and the Western Municipal Water District. The rates are based on the costs associated with water consumption for specific uses, such as residential indoor; outdoor residential yard; and commercial, industrial, and institutional indoor and outdoor use. The IRWD rates, for example, incorporate a 50 gpcd baseline factor for residential use and residential yard irrigation in accordance with applicable landscape area and plants. The costs of supplying water increase with the volume of use because a supplier must utilize more expensive supplies to meet progressively higher marginal water demands. As a result, water-budget based rates used by the IRWD and other districts incorporate lower rates for use below the applicable indoor and outdoor budgets, and higher rates for use above the budgeted levels to reflect the marginal costs of supplying additional water.

Water budget based rates provide an effective means for discouraging overuse generally and for significantly reducing outdoor water use. For example, the IRWD implemented this type of rate structure in 1991 and has since achieved a 50 percent reduction in per capita water use for residential customers. Average IRWD residential indoor and outdoor water use is about 85 gpcd, among the lowest levels in the State, and IRWD is regarded as a statewide leader in water efficiency (IRWD 2017). A 2016 study found that water budget-based rates significantly reduce overall water demand, particularly by less efficient users, and are much more effective than watering restrictions, low-flow fixtures and appliances, turf removal subsidies, and information/education campaigns (Mukherjee et al. 2016).

In 2015, a California Court of Appeals decision found that a water district's tiered rate structure violated the state constitution because the rates in each tier were not related in any way to the water purveyor's marginal cost of service (*Capistrano Taxpayers Assn., Inc. V. City Of San Juan Capistrano* 235 Cal.App.4th 1493 [2015]). The Capistrano case emphasized, however, that water budget based or tiered rates are "thoroughly compatible" with the state constitution provided they reasonably reflect the cost of service to each parcel. The court also determined that water rates may also permissibly impose higher rates on high-use consumers whose extra use of water forces water agencies to incur higher costs to supply extra water. Several districts, including the IRWD, have determined that the water budget based rates comply with the requirements of the Capistrano case because they are properly based on documented costs of service (IRWD 2015; Western Municipal Water District 2015). The Project Water Purveyor will comply with all legal requirements in the establishment of water budget based rates.

Project Water Demand

The Project's water demand incorporates the recommendations of the Peer Review Report submitted by Kennedy-Jenks to the County in 2017 (Appendix 5.18-G). To reflect historical water use levels in the Antelope Valley and Santa Clarita areas where much of the existing housing and other developed infrastructure predates the installation of more efficient indoor and outdoor water fixtures and irrigation technologies, the Peer Review Report recommends using a 60 to 65 gpcd range as the indoor residential water use factor for the Project. As discussed in Section 5.18.2, Relevant Plans, Policies, and Regulations, state law currently requires that water districts reduce per capita urban demand by 20 percent by 2020. Consistent with this objective, more stringent, low-flow fixture requirements have been implemented in the CALGreen Code, as adopted by Los Angeles County and the state in 2013, which include the emergency regulations adopted in response to Executive Order No. B-29-15. These building codes specify the maximum allowable flowrates for fittings and fixtures and are consistent with the *California Health and Safety Code,* the California Plumbing Code, and the California Energy Commission's proposed Appliance Efficiency Regulations. These building codes include the following standards, which have recently been updated in response to the Governor's Executive Order No. B-29-15:

- **Toilets:** 1.28 gallons per flush
- **Showers:** effective July 1, 2016, 2.0 gallons per minute (gpm) at 80 pounds per square inch (psi) decreasing to 1.8 gpm after July 1, 2018
- **Bathroom Faucets:** 1.2 gpm at 60 psi
- **Kitchen Faucets:** 1.8 gpm at 60 psi;
- **Common Area Bathroom Faucets:** 0.5 gpm at 60 psi
- **Urinals:** 0.125 gallon per flush

In November 2016, five state resource agencies published a framework report for implementing permanent water conservation measures, including indoor and outdoor residential, commercial, industrial, and institutional water use standards to implement Executive Order B-37-16. The report states that, until a new standard for indoor residential water use is adopted in 2025, the existing *California Water Code* standard of 55 gpcd will apply in California (DWR et al. 2016b). As noted in the framework report and in the current California Water Plan, the USEPA and the DWR have published studies demonstrating that standard homes built after 2001 that do <u>not</u> include the USEPA's more efficient WaterSense residential specifications consume 44.2 gpcd for indoor uses (DWR 2014; Aquacraft 2011a, 2011b). The studies also show that standard homes retrofitted or built to WaterSense or similar specifications can achieve indoor water use rates ranging from 35.6 to 39 gpcd (see Table 5.18-6).

TABLE 5.18-6
RESIDENTIAL INDOOR WATER USE RATES IN
U.S. ENVIRONMENTAL PROTECTION AGENCY AND
CALIFORNIA DEPARTMENT OF WATER RESOURCES
NATIONAL AND CALIFORNIA STUDIES

Type of Home	Indoor Water Use (gpcd)
USEPA study of nationwide homes built before 1995	62.2
California study of 93% of homes built before 1994 and 7% of homes built between 1995 and 2006	53.9
"Standard homes" built since 2001 not specifically designed for water use efficiency	44.2
Standard homes retrofitted to approximate USEPA WaterSense specifications	39
High efficiency homes built to USEPA WaterSense or similar specifications	35.6
gpcd: gallons per capita per day; USEPA: U.S. Environmental Protection Agency; DWR: California Department of Water Resources Sources: Aquacraft 2011a (Table 4-33), 2011b (Tables 63 and 73).	

The analysis of Project water supply and demand uses the most conservative residential indoor demand recommended in the Peer Review Report (i.e., 65 gpcd). This water use factor is 47 percent higher than the post-2001 standard home rate documented in the DWR and USEPA studies (44.2 gpcd) and 18 percent higher than the 55 gpcd standard in the multi-agency framework report and the statewide provisional standard set by the state legislature in 2009 (*California Water Code,* Section 10608.20[B]). The Project will comply with all applicable water conservation, fixture and irrigation efficiency standards, including existing and proposed standards that would result in or require lower water demands. Water budget based rates will be implemented by the Project Water Purveyor and will incorporate the more stringent of the existing state 55 gpcd or future adopted State or County use residential indoor use factors to ensure that Project demand will not exceed the projected levels. As a result, the Project's water use may be lower than projected using the recommended water use factors in the Peer Review Report.

As discussed in Section 4.0, Project Description, at full buildout, the Project will include up to 19,333 dwelling units; a resident population of 57,150; and up to 10,097,208 square feet of commercial, business park, recreation, civic, institutional, and utility uses. The total potable water demand will be approximately 6,788 afy, including a 5 percent potable water system loss. Approximately 4,577 afy of recycled water will be generated by treating the Project's wastewater flow. To account for losses in the wastewater treatment and recycled water distribution system, the demand estimates include a conservative ten percent loss between indoor water demand and wastewater flow volumes and the available recycled water supply. Recycled water will be used to irrigate parks, common areas, slopes, arterial roadways, landscaped non-residential areas, portions of larger residential lots, and for wastewater and cooling purposes in the business park. Total water demand at buildout will be approximately 11,365 afy, including potable system losses. Recycled water will supply approximately 40 percent of the Project's buildout demand.

The Project Water Purveyor will continuously meter and monitor all on-site water use to identify and repair water system facility, equipment, fixtures and irrigation device leaks to conserve supplies. A water budget-based rate structure that meets applicable legal requirements will be utilized to create volumetric pricing incentives for greater water use efficiency based on the marginal cost of supplying water in excess of budgeted levels; to identify water users that are significantly exceeding planned consumption rates; and to allow for the remediation of malfunctioning equipment or enforcement to address chronic overuse. In addition, the Project Water Purveyor will monitor water use to ensure conformance with the plant palette and irrigation efficiency standards for specific land uses in Section 3.4 of the *Centennial Specific Plan*. These standards include the installation of water- and climate-sensing irrigation controllers that will reduce demand by applying outdoor water only on an as-needed basis.

Table 5.18-7 summarizes the projected water demand by land use for the Project. The water demand, loss, and other factors used in the analysis are consistent with the recommendations of the Peer Review Report submitted (see Appendix 5.18-G).

TABLE 5.18-7
CENTENNIAL LAND USE AND WATER DEMAND AT PROJECT BUILDOUT

						Indoor Potable Demand		Outdoor Potable Demand		Total Potable Demand	Recycled (Irrigation and Dual Use Plumbing) Water Demand		
Land Use Designation	**Net Acres**	**Density (du/ac)**	**Dwelling Units**	**Building (sf)**	**Persons/ du**	**Factor[a]**	**afy**	**Factor[b]**	**afy**	**afy**	**Irrigation (%)**	**Factor[c]**	**afy**
Residential													
Very Low Density	646	2	1,270		3.17	206	293	130	185	478		166	236
Low Density	1,960	5	9,660		3.17	206	2,230	81	876	3,106		103	1,115
Medium Density	674	9											
Detached			3,168		3.17	206	731	81	287	1,019			
Attached			2,880		2.38	155	499	25	81	580		46	148
High Density	136	13	2,055		2.38	155	356	5	12	368		57	131
Very High Density	12	24	300		2.38	155	52	1	0[f]	52		15	5
Residential Subtotal	*3,428*		*19,333*		*57,150*		*4,161*		*1,441*	*5,602*			*1,635*
Schools			**Students**										
Grades (K–8)	88		6,985			5	39			39	50%	4,000	197
Grades (9–12)	60		2,840			10	32			32	50%	4,000	134
Schools Subtotal	*148*		*9,825*				*71*			*71*			*332*
Non-Residential			**Rooms**										
Commercial	95			1,034,550		200	232			232	20%	2,800	60
Business Park	483												
Potable Indoor and Irrigation				7,211,358		65	368			368	20%	2,800	303
Recycled Indoor Use													157
Hotel			400	152,460		125	56			56			
Civic/Institutional	90			1,568,160		50	88			88	15%	2,800	42
Public/Utility[d]	191			200,000		65	15			15	5%	2,800	30
Commercial Subtotal	*859*			*9,966,528[g]*			*758*		*0*	*758*			*592*
Open Space/Parks/Slopes/Etc.													
Public Parks	163										80%	4,200	613
Private Parks	19										50%	4,200	45
Park Lakes	20										75%	4,200	71
Recreation/Entertainment	75			130,680		200	29		5	34	50%	2,900	122
Slopes	750										100%	1,200	1,008
Arterial Roadways[e]	327										30%	1,500	160
Not Irrigated													

TABLE 5.18-7
CENTENNIAL LAND USE AND WATER DEMAND AT PROJECT BUILDOUT

						Indoor Potable Demand		**Outdoor Potable Demand**		**Total Potable Demand**	**Recycled (Irrigation and Dual Use Plumbing) Water Demand**		
Land Use Designation	**Net Acres**	**Density (du/ac)**	**Dwelling Units**	**Building (sf)**	**Persons/ du**	**Factor[a]**	**afy**	**Factor[b]**	**afy**	**afy**	**Irrigation (%)**	**Factor[c]**	**afy**
Open Space	5,623												
Internal Roadways	830												
Other	80												
Open Space/Parks/Slopes/Etc. Subtotal	*7,887*			*130,680*			*29*		*5*	*34*			*2,018*
Non-Residential Subtotal	*8,894*			*10,097,208*			*858*		*5*	*862*			*2,942*
Subtotal	**12,322**						**5,019**		**1,446**	**6,465**			**4,577**
Potable System Loses (5%)							251		72	323			
Total Water Demand							***5,270***		***1,518***	***6,788***			***4,577***

du/ac: dwelling units per acre; sf: square feet; du: dwelling unit; afy: acre-feet per year; K: Kindergarten; gpd: gallons per day

[a] Indoor Water Demand is estimated as gpd per dwelling unit for residential; gallons per thousand square feet for non-residential; gpd per student; and gpd per hotel room.
[b] Outdoor Potable Water Demand is estimated as gpd/unit for residential and gallons per thousand square feet for non-residential land uses.
[c] Common Area Irrigation Demand is estimated as gpd/unit for residential and gallons per acre per day multiplied by the applicable irrigation percentage shown for each land use.
[d] Building square footage for water district facilities is not included in the non-residential building area totals.
[e] Includes approximately 4,136,951 sf of irrigation for the 6-lane arterial roadway, 4-lane arterial collector and industrial collector included in the *Centennial Specific Plan.*
[f] Number here is 0.34 and was rounded to "0".
[g] The 200,000 sf for Public/Utility is not included in the total

All values subject to rounding.

Source: Psomas 2017a

In 2015, the DWR updated the state Model Water Efficient Landscape Ordinance (MWELO) to reduce the maximum level of potable outdoor water use that California should use for outdoor irrigation to reduce water demand. As amended, the MWELO requires the calculation of a Maximum Applied Water Allowance (MAWA) for outdoor water use that is no more than 55 percent of the reference evapotranspiration (ETo) rate for residential landscaping and 45 percent for commercial landscaping. Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation from soil and plant surfaces and water taken up by the plants, used, and subsequently transpired as water vapor. The ETo rate is derived from the measured ET levels for standardized grass or alfalfa at weather stations in specific locations of the state. In general, the reference ETo rate is higher in drier and hotter regions than in wetter and cooler locations. Based on the reported ETo levels at 3 California monitoring stations closest to the site, the reference ETo rate for the Project site is approximately 64.15 inches per year (Psomas 2017c).

The Project has been designed to reduce potable outdoor demand by using water-efficient plants and efficient irrigation equipment to facilitate landscaping that meets the MAWA as required by the MWELO, specifically no more than 55 percent of the reference ETo for residential landscaping and no more than 45 percent of the reference ETo for commercial landscaping. This equals an average application rate of approximately 35 inches per year for residential landscaping and 29 inches per year for commercial landscaping based on the ETo rate of 64.15 inches per year. As shown in Section 3.4 of the *Centennial Specific Plan,* residential and other land use landscaping will utilize a plant palette and irrigation equipment to ensure that outdoor water use is consistent with these application rates. Landscaping will primarily consist of climate-adapted plants that require occasional water (with a plant factor as defined in the MWELO of 0.3 or less) installed on at least 75 percent of the planted area, excluding areas irrigated with recycled water. Efficient irrigation will be achieved through the use of automatic weather-based irrigation controllers required on all lots that use ET or soil moisture sensor data and have rain sensors. Pressure regulators will be installed on irrigation systems to ensure the dynamic pressure of the system is within the manufacturer's recommended pressure range. The irrigation objective will be flexibly achieved by matching plant types with a required level of irrigation efficiency within each lot. Lots that include turfed areas, for example, must utilize very low water use shrubs in other locations and install efficient turf and drip irrigation systems to meet the overall outdoor water application rate. Lots that are planted with very low water use shrubs could achieve the outdoor application rate with less efficient irrigation systems or a mix of low, moderate, and limited numbers of high-water use shrubs. Consistent with the California Water Plan and the Peer Review Report, a budget-based water rate structure based on the cost of water service for the Project will be utilized to ensure that outdoor demand remains within projected levels (DWR 2014 [Vol. 3, Ch. 3]; Kennedy/Jenks 2017).

As shown in Table 5.18-7, approximately 75 percent (285 afy of 377 afy) of the outdoor water use for medium density attached, high density, and very high density residential will be supplied by recycled water in common area landscaping. In addition, dual water piping will be installed to supply recycled water for irrigation of the Project's very low and low density lots. About 56 percent (1,351 afy of 2,412 afy) of the outdoor irrigation in very low density and low density lots will consist of recycled water supplied from the on-site wastewater reclamation facilities. Recycled water will be used on approximately 50 percent of the landscape areas around the outer portions of each lot and supplemented with potable water for irrigation adjacent to residential structures. Areas irrigated with recycled water are designated in the MWELO as a Special Landscape Area allowing higher irrigation application rates up to 100 percent of the applicable ETo. The residential areas irrigated with recycled water will still implement water efficient palettes and irrigation techniques to facilitate landscaping that meets a MAWA of 70 percent of the reference ETo.

The Project's total residential water use will be approximately 113 gpcd at buildout, including the projected 65 gpcd of potable water for indoor residential use recommended in the Peer Review Report; 22.5 gpcd for outdoor potable residential water use; and 25.5 gpcd of recycled water for outdoor irrigation in very low and low density lots and residential common areas.

Commercial, business park, industrial, and civic/institutional (CII) indoor water use was estimated by using factors developed for similar land uses in the Irvine Ranch Water District 1999 Water Resources Master Plan (IRWD 2003) and in a 2011 American Water Works Association report (Morales et al. 2011). The factors estimate indoor water use on the basis of gallons per day (gpd) utilized per 1,000 square feet (ksf) of non-residential floor space. The IRWD water use factors were derived from an eight-year study of water use data in the IRWD service area. The 2011 American Water Works Association report developed CII water use factors from customer-level water billing data for 3,172 customers combined with a statewide (Florida) inventory. The CII indoor water use factors, developed from the 2 studies and used to estimate Project demand, are summarized in Table 5.18-7 and include 200 gpd/ksf for commercial land uses, 65 gpd/ksf for business park land uses, 50 gpd/ksf for civic and institutional land uses, and 125 gpd/room for hotels (Psomas 2017a). Indoor CII potable water use will be further reduced by installing dual plumbing systems in the business park for use in toilets and urinals as well as for building cooling purposes. As shown in Table 5.18-7, approximately 30 percent of total business park indoor demand (157 afy of 525 afy) will be met by using recycled water to meet these demands.

Non-residential outdoor irrigation, including school and park turf areas, CII, roadway landscaping, and other park and vegetated slope areas, will be reduced by requiring the installation of equipment with high irrigation efficiencies and low water-use plants on the site. "Irrigation efficiency" refers to the percentage of applied water that can be used by irrigated plants net of evaporation, conveyance, soil infiltration, and other losses. The Project will require the installation of equipment with a 0.80 outdoor irrigation efficiency for public and private parks and a 0.81 efficiency for recreation and entertainment land use, arterial roadway, and slope irrigation (Psomas 2017c).

Vegetation water requirements are defined in the MWELO as a "plant factor" ranging from 0 to 1 that, when multiplied against the applicable reference ETo, reflects the amount of water required to support a plant species. The plant factor range for low water use plants is 0.1 to 0.3; the plant factor range for moderate water use plants is 0.4 to 0.6; and the plant factor range for high water use plants is 0.7 to 1.0. As shown in Table 5.18-7, the Project will irrigate 750 acres of slopes for stability and to control erosion. To reduce slope irrigation demand, the plant factor for species used to vegetate slopes will be 0.2, the middle of the range for low water use plants. The irrigation efficiency and plant factor requirements will generate a recycled water demand for slopes of approximately 1,008 afy (see Table 5.18-7). Consistent with the Peer Review Report, the Project water demand includes a plant establishment factor to account for water use required during the initial phases of landscape establishment.

Table 5.18-8 summarizes the Project's buildout water demand, including approximately 6,788 afy of potable and 4,577 afy of recycled water use. Total demand will be approximately 11,365 afy. At full buildout, the Project's total per capita water use will be approximately 177.5 gpcd.

TABLE 5.18-8
SUMMARY OF PROJECT BUILDOUT DEMAND
AND PER CAPITA WATER USE

Potable Demand (afy)	6,788
Recycled Demand (afy)	4,577
Total Water Demand (afy)	**11,365**
Buildout Population	57,150
Total Water Use (gpcd)	177.5
Source: Psomas 2017a	

As discussed above, the General Plan Update Draft EIR and the AVIRWMP estimate per capita urban water demand for the Antelope Valley and water districts serving the region (see Table 5.18-8). The General Plan Update Draft EIR estimates the average 2035 per capita daily water demand in the County, including Antelope Valley, at 142 gpcd to comply with the State's urban water use reduction mandates (DRP 2015c). The General Plan Update Final EIR incorporates the AVAP Final EIR analysis, which projected water demands based on the average AVIRWMP estimate for the Antelope Valley of 199 gpcd. The Project's buildout demand of approximately 177.5 gpcd is in the middle of and consistent with the range of these projections. As shown in Table 5.18-5, the AVIRWMP estimates that in 2010 overall regional water use averaged 199 gpcd. The AVIRWMP also notes that the 2010 levels may decline to meet the State's water reduction requirements, including the 20 percent urban water use reduction by 2020 enacted by the State in 2009. As shown in Table 5.18-5, if the regional water districts analyzed in the AVIRWMP reduced estimated 2010 urban demand by 10 percent from 2010 levels regional water use would average about 179 afy. The Project's water demand is also consistent with these projections.

The Project will achieve higher levels of water use efficiency than in most existing Antelope Valley developed areas because new development must utilize significantly more efficient plumbing, technology, fixtures, appliances, and other water system equipment to comply with applicable federal, State, and local regulations. The State's provisional residential indoor and other standards that would be implemented under Executive Order B-37-16 also require that new development water consumption be more efficient than in existing communities. Outside the cities of Lancaster and Palmdale, the region is largely rural with large lots or farm areas and isolated subdivisions that do not possess the centralized services, conservation features, and planned landscaping or water recycling features included in the Project. The region's more urban areas generally were not constructed and have not been upgraded to include the water efficient technologies and management measures required for the Project, including the extensive use of recycled water and native and drought-tolerant landscaping. As a result, existing regional water utilization rates are anticipated to remain generally higher than the Project's water consumption rates. Project development will result in an increment of regional growth that incorporates more efficient potable and recycling water systems and requirements.

As discussed above, the analysis of Project demand includes the factors recommended in the Peer Review Report submitted to the County, including a 65 gpcd indoor water consumption rate (Kennedy/Jenks 2017). The existing State residential indoor water use standard is 55 gpcd. Published studies indicate that lower rates of consumption have been achieved in California (DWR 2014; Aquacraft 2011a, 2011b). The 2016 framework plan for implementing Executive Order B-37-16 cites a 2016 Water Research Foundation study that found that the national residential indoor water use average is about 59 gpcd and that toilet replacement and continued enforcement of federal clothes washing machine water use efficiency standards would lower residential indoor water use by 6 gpcd by 2030 and by 9 gpcd by 2040 (DWR et al. 2016b). The Project will comply with all applicable laws and regulations, including State and local water use standards that may be lower than the conservative rates used in the Project demand analysis. Consequently, actual project demand may be lower than projected, as both existing and potential new water use standards and requirements are implemented in California.

Construction Demand

As shown in Table 5.18-9, construction will require grading of approximately 127 million cubic yards (mcy) from Year 1 to Year 18 of the Project. About 76.72 acre-feet of water will be required to obtain the optimum moisture content for compaction and for dust suppression and other construction purposes per mcy of grading. Approximately 9,744 acre-feet of water for construction will be required from Year 1 to Year 18 of the Project.

TABLE 5.18-9
CONSTRUCTION WATER DEMAND BY PHASE AND YEAR

Year	Grading (mcy)	Water Demand (af)
Year 1	2.0	153
Year 2	11.0	844
Year 3	10.0	767
Year 4	8.0	614
Year 5	6.0	460
Year 6	6.0	460
Year 7	5.0	384
Year 8	4.0	307
Year 9	5.0	384
Year 10	6.5	499
Year 11	17.0	1,304
Year 12	7.5	575
Year 13	6.0	460
Year 14	8.0	614
Year 15	7.0	537
Year 16	7.0	537
Year 17	8.0	614
Year 18	3.0	230
Year 19	0.0	0
Year 20	0.0	0
Total	**127.0**	**9,744**

mcy: million cubic yards; af: acre-feet

Totals may not add due to rounding.

Source: Psomas 2017a

Construction water use is a one-time demand that does not recur after construction is complete. The additional construction water demand during Project years 1 through 18 has been incorporated into the projections of average, single-dry and multiple-dry year water supplies shown in Tables 5.18-10, 5.18-11, and 5.18-12.

Project Water Supplies

Project water supplies consist of imported surface water, recycled water, groundwater, return flows, and banked surface water that are managed in an interrelated, conjunctive manner to meet demand. The following discussion first summarizes the Project's primary water facilities. Next, the amount and reliability of the Project's water supplies and the projected supplies and demand during average, single-dry, and multiple-dry years are discussed in detail.

Water Facilities

As shown in Exhibit 5.18-7, Preliminary Water Storage and Distribution System, the Project's water supply facilities include existing off-site and proposed on-site water banking facilities that allow for the percolation, storage, and extraction of water for Project use; on-site potable water treatment facilities to treat potable water to applicable water quality standards, including the federal and California Safe Drinking Water Acts and related regulations; on-site wastewater treatment facilities that will treat the Project's indoor wastewater flows to Title 22 unrestricted reuse standards; and water distribution facilities including pipelines, pump stations, storage reservoirs, and pressure regulating valves that will convey recycled water for outdoor irrigation and indoor business park use. The Project's water facilities will be owned and operated by a Project Water Purveyor that will be regulated by the California Public Utilities Commission or formed as a Community Services District, a statutory water district, or other entity with the appropriate capacity to own, operate, and maintain the Project's water system. The Project Water Purveyor will be funded through a rate-payer system and fees. Until the Project Water Purveyor is established, the Project Applicant/Developer will be responsible for all Project-related water services. All of the Project's water supplies and the design, permitting, financing, and construction of all treatment, collection, and distribution infrastructure will be provided by the Project Applicant/Developer. The following sections describe the water supply facilities that will serve the Project.

Existing Tejon Ranch Company Water Bank. The Tejon Ranch Company (TRC) and its affiliates currently own and operate a water bank on 160 acres located northeast of the Project site in Kern County (TRC Water Bank).[1] The water bank was constructed in 2006 and currently stores water for TRC and AVEK. As of December 2015, approximately 17,287 acre-feet is stored for Project use. The TRC Water Bank would provide water storage and extraction facilities to the Project under a contract with the Project Water Purveyor. The conveyance facilities between the TRC Water Bank and the Project would be designed, permitted, financed, and constructed by the Project Applicant/Developer. TRC would also provide appropriate easements for access to the TRC Water Bank. The TRC Water Bank is included as a preexisting banking facility that will continue operations in the Antelope Valley in accordance with the adjudication Judgment and Physical Solution (see Appendix 5.18-D).

The water bank consists of several recharge basins or infiltration ponds separated by a series of small overflow weirs. Water is introduced to the facility by pumping water from a turnout on the East Branch of the California Aqueduct (East Branch) to the banking facility and then infiltrated into the local aquifer for storage. All water banked for Project use is subject to a leave-behind requirement of ten percent of the infiltrated water amount to account for banking losses; to support the regional aquifer; and to conform with the requirements of the Judgment and Physical Solution. AVEK also pumped water from a turnout on the East Branch to the TRC Water Bank during 2011 to store excess supplies available under its SWP water supply contract. The turnout serving the TRC Water Bank is owned by AVEK and is located at

1 Kern County is a responsible agency for purposes of the Centennial EIR.

approximately the intersection of 305th Street West and the Aqueduct. The turnout has been upgraded and will be managed for Project use in accordance with turnout operating and maintenance agreements among TRC, AVEK, and the DWR. A pipeline has been installed between the turnout and the TRC Water Bank and can deliver water to separate ponds in the recharge facility. The TRC Water Bank has the capacity to recharge approximately 11,500 afy. There is at least 161,000 acre-feet of unused aquifer storage within 0.5 mile of the existing TRC banking facility and the proposed on-site water banking facility (described below)(GEI 2005, 2010). The location of the TRC Water Bank relative to the Project is depicted in Exhibit 4-13, Centennial Project – Conceptual Domestic Water Supply System, in Section 4.0, Project Description.

On-Site Water Banking Facility. A second, approximate 100-acre water banking facility will be designed, permitted, financed, and constructed by the Project along the northern edge of the site to provide additional water recharge capacity. The on-site bank will also facilitate the periodic rotation of infiltration or extraction between the TRC Water Bank and the on-site bank to avoid potential impacts to the local aquifer. A transmission pipeline will extend from an existing East Branch turnout located at approximately the intersection of 320th Street West and the California Aqueduct, and will be routed along the southern edge of the bank to allow for delivery to recharge ponds in the facility. The turnout will be upgraded and managed in accordance with the turnout operating and maintenance agreements between AVEK and the DWR. The on-site water bank will also be able to obtain water from a turnout located on the West Branch of the California Aqueduct. A series of contoured infiltration basins separated by a network of berms and overflow weirs will be constructed to receive and infiltrate the water. The on-site water bank's soil and storage characteristics are similar to those of the existing TRC banking facility and will have the capacity to infiltrate and store approximately 7,200 afy. As indicated above, there is at least 161,000 acre-feet of unused aquifer storage within 0.5 mile of the proposed on-site and the existing TRC Water Bank facilities (GEI 2010, 2005). The on-site water banking facilities are depicted in Exhibit 4-13. New water banking facilities in the Antelope Valley Basin, including the proposed on-site bank, are subject a storage agreement with the watermaster in accordance with the adjudication Judgment and Physical Solution (see Appendix 5.18-D).

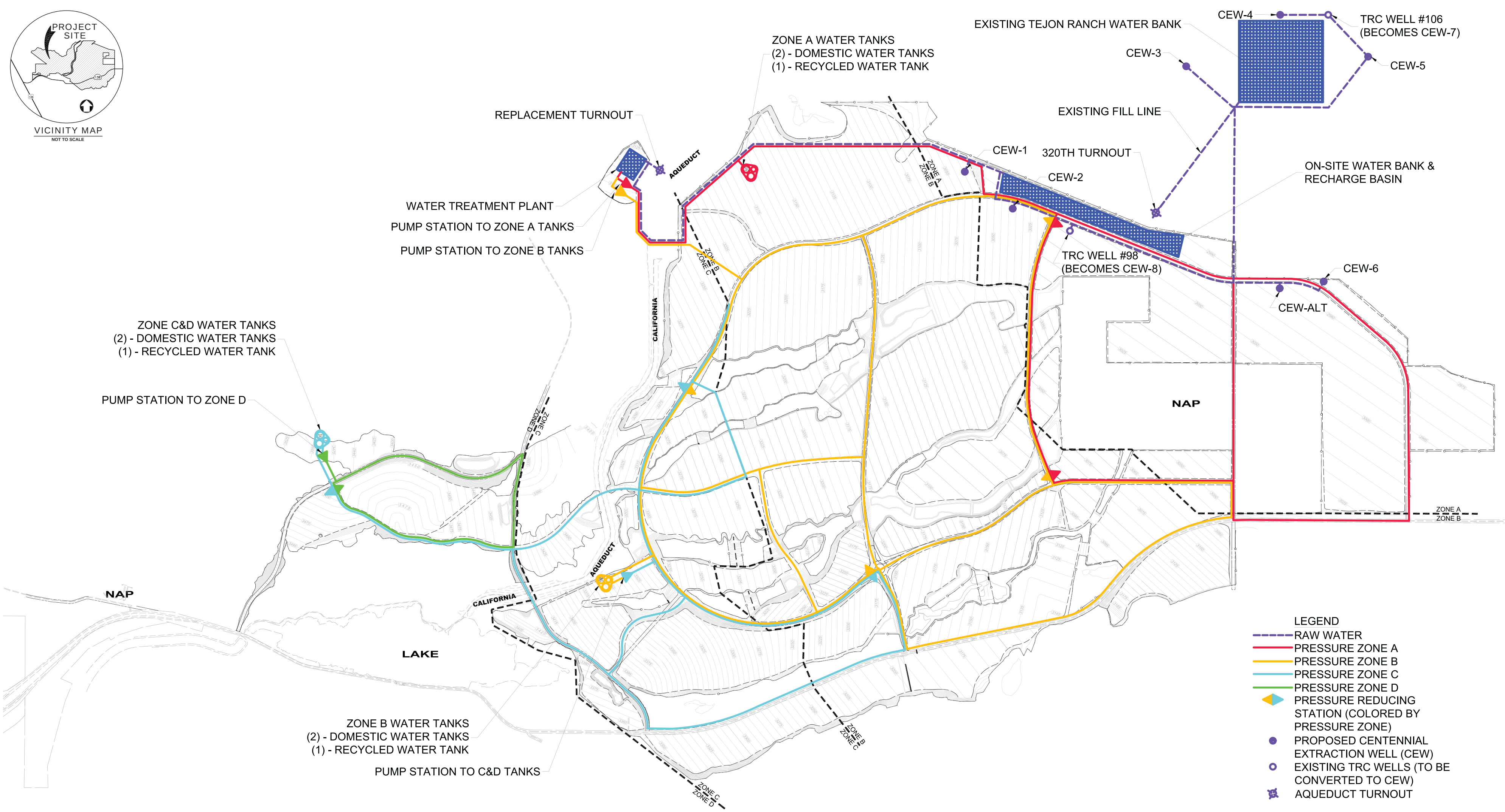
Monitoring and Extraction Wells. A series of existing and new on-site and off-site wells will be used to monitor groundwater levels; to extract banked water; to recover return flows; and to extract groundwater for Project use in accordance with the Judgment and Physical Solution. Off-site wells will be located on land owned by TRC to the north and east of the site. The well system will be connected to the on-site water treatment and distribution facilities by a network of pipelines that will be designed, permitted, financed, and constructed by the Project Applicant/Developer. Exhibit 4-13 shows the Project's conceptual monitoring and extraction well field and water transmission system.

Potable Water Treatment Facility. The Project Applicant/Developer will design, permit, finance, and construct an on-site water treatment plant adjacent to the West Branch of the Aqueduct to provide potable water for the Project. The treatment plant will include required chlorination and other disinfection facilities; it will also include ion exchange or other available, feasible technologies that will ensure that potential constituent levels, including arsenic, are reduced below applicable MCL and other water quality requirements. The DWR has constructed a new turnout from the West Branch to replace a turnout previously demolished in conjunction with the enlargement of the Tehachapi Afterbay located to the north of the Project site. The turnout is owned and managed by AVEK. The West Branch turnout can be used to supply the on-site water bank during periods when the East Branch may lack capacity to convey water to the facility. The locations of the Project water treatment plant, the West Branch turnout, and the primary connecting pipelines between these facilities are identified in Exhibit 4-13.

Wastewater Treatment Facilities. All wastewater flows generated by the Project will be collected and treated to Title 22 standards for unrestricted reuse in on-site wastewater treatment facilities. Approximately 90 percent of the indoor wastewater flows will be available for external irrigation and for wastewater and cooling use within the business park. At buildout, the recycled water supply will meet approximately 40 percent of the Project's water demand. The Project Applicant/Developer will design, permit, finance, and construct the on-site wastewater collection, treatment, and recycled water distribution facilities. Wastewater reclamation facilities are also discussed in Sections 5.2 (Hydrology and Flood) and 5.19 (Wastewater) of this EIR. The locations of the planned wastewater reclamation facilities are shown in Exhibit 4-14, Centennial Project – Conceptual Wastewater System, in Section 4.0, Project Description.

Water Supplies

The Project's water supplies include the following: (1) water currently banked at the existing TRC Water Bank to the north of the Project site; (2) purchased and in-lieu program rights to water deliveries from AVEK and the return of certain water supplies loaned to AVEK in 2008 and 2009 for later return and delivery (collectively, "AVEK call water"); (3) groundwater subject to the allocations in the Judgment and Physical Solution; (4) Table A Amounts transferred from the Tulare Lake Basin Water Storage District and the Dudley Ridge Water District that will be imported for Project use under an existing agreement with AVEK; (5) service area deliveries of SWP water by AVEK that are incorporated in the Agency's current UWMP; (6) recycled water treated to Title 22 unrestricted reuse levels generated by the Project's on-site wastewater treatment facilities; and (7) in-basin return flows from Project imported water use in accordance with the Judgment and Physical Solution. The existing TRC Water Bank and the proposed on-site water bank will be used to bank, store, and retrieve water for use in later dry periods to enhance the Project's overall water supply reliability. As shown in Tables 5.18-10, 5.18-11, and 5.18-12, the Project's water supplies meet projected demand at buildout and, on a sustainable basis thereafter, allow for the maintenance of an average annual reserve banked supply of more than 79,000 acre-feet. The amount of the average annual reserve that will be maintained in the water banks equates to more than 11 years of the Project's full buildout potable demand and provides the Project with a significant emergency supply.



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Preliminary Water Storage, and Distribution System

Exhibit 5.18-7

Centennial Project

(Rev: 2/6/2017 CJS) R:\Projects\CEN\000306\Graphics\EIR\Ex5.18-7_water_storage_20170206.pdf

TABLE 5.18-10
AVERAGE YEAR SUPPLIES AND DEMAND, YEARS 1–20 TO PROJECT BUILDOUT AND YEARS 21–25 AFTER BUILDOUT

Annual Sources and Uses of Water Supplies	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Supplies Available																									
Table A: Tulare Lake (less 5% to AVEK)	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813	813
Table A: Dudley Ridge (less 5% to AVEK)	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117
Recycled Water	146	301	512	802	1,014	1,296	1,529	1,818	2,031	2,308	2,552	2,884	3,121	3,407	3,629	3,903	4,124	4,345	4,577	4,577	4,577	4,577	4,577	4,577	4,577
Return Flows	0	0	0	0	2	14	36	67	105	160	225	320	382	448	516	580	623	713	794	862	932	981	1,004	1,023	1,034
Groundwater	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634	1,634
AVEK Table A Import	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360
Total Supplies	*6,070*	*6,225*	*6,436*	*6,726*	*6,940*	*7,234*	*7,489*	*7,809*	*8,060*	*8,392*	*8,701*	*9,128*	*9,427*	*9,779*	*10,069*	*10,407*	*10,671*	*10,982*	*11,295*	*11,363*	*11,433*	*11,482*	*11,505*	*11,524*	*11,535*
Water Demands																									
Project Water	624	1,060	1,633	2,221	2,786	3,395	3,984	4,569	5,117	5,731	6,379	7,034	7,614	8,202	8,751	9,327	9,870	10,441	10,983	11,365	11,365	11,365	11,365	11,365	11,365
Construction Water	153	844	767	614	460	460	384	307	384	499	1,304	575	460	614	537	537	614	230	0	0	0	0	0	0	0
Plant Establishment	92	52	70	55	67	61	68	54	64	63	77	59	65	56	62	56	61	56	61	18	0	0	0	0	0
Total Demand	*869*	*1,956*	*2,470*	*2,890*	*3,313*	*3,916*	*4,436*	*4,930*	*5,565*	*6,293*	*7,760*	*7,668*	*8,139*	*8,872*	*9,350*	*9,920*	*10,545*	*10,727*	*11,044*	*11,383*	*11,365*	*11,365*	*11,365*	*11,365*	*11,365*
Supplies Transferred to (from) Water Bank	**5,201**	**4,269**	**3,966**	**3,836**	**3,627**	**3,318**	**3,053**	**2,879**	**2,495**	**2,099**	**942**	**1,460**	**1,289**	**908**	**719**	**489**	**127**	**255**	**252**	**(20)**	**69**	**117**	**140**	**159**	**170**
Water Bank Activity and Balances	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**	**Year 21**	**Year 22**	**Year 23**	**Year 24**	**Year 25**
Beginning Water Bank Balance	**17,287**	**21,635**	**26,781**	**31,655**	**36,411**	**40,980**	**45,270**	**49,323**	**53,218**	**56,768**	**59,961**	**62,114**	**64,732**	**67,197**	**69,318**	**71,270**	**73,014**	**74,433**	**75,967**	**77,499**	**78,783**	**78,845**	**78,950**	**79,076**	**79,219**
Supplies Transferred to (from) Water Bank	5,201	4,269	3,966	3,836	3,627	3,318	3,053	2,879	2,495	2,099	942	1,460	1,289	908	719	489	127	255	252	(20)	69	117	140	159	170
AVEK Call Water	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	0	0	0	0	0
Net Transfers to (from) Water Bank	**6,651**	**5,719**	**5,416**	**5,286**	**5,077**	**4,768**	**4,503**	**4,329**	**3,945**	**3,549**	**2,392**	**2,910**	**2,739**	**2,358**	**2,169**	**1,939**	**1,577**	**1,705**	**1,702**	**1,430**	**69**	**117**	**140**	**159**	**170**
10% Loss for Current Year Additions (excl. GW)	(2,303)	(572)	(542)	(529)	(508)	(477)	(450)	(433)	(395)	(355)	(239)	(291)	(274)	(236)	(217)	(194)	(158)	(170)	(170)	(145)	(7)	(12)	(14)	(16)	(17)
Ending Water Bank Balance (reserve supply)	**21,635**	**26,781**	**31,655**	**36,411**	**40,980**	**45,270**	**49,323**	**53,218**	**56,768**	**59,961**	**62,114**	**64,732**	**67,197**	**69,318**	**71,270**	**73,014**	**74,433**	**75,967**	**77,499**	**78,783**	**78,845**	**78,950**	**79,076**	**79,219**	**79,372**

AVEK: Antelope Valley – East Kern Water Agency

All values are subject to rounding.

Source: Psomas 2017a.

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TABLE 5.18-11
WATER SUPPLIES AND DEMAND IN A SINGLE-DRY YEAR,
PROJECT YEARS 5, 10, 15, AND 20 (FULL BUILDOUT)

Annual Sources and Uses of Water Supplies	Year 5	Year 10	Year 15	Year 20
Supplies				
Table A: Tulare Lake (less 5% to AVEK)	69	69	69	69
Table A: Dudley Ridge (less 5% to AVEK)	95	95	95	95
Recycled Water	1,014	2,308	3,629	4,577
Return Flows	2	160	516	862
Groundwater	1,634	1,634	1,634	1,634
AVEK Table A Import	200	200	200	200
Total Supplies	*3,014*	*4,466*	*6,143*	*7,437*
Total Demand (including construction and plant establishment)	*3,313*	*6,293*	*9,350*	*11,383*
Supplies Transferred to (from) Water Bank	**(299)**	**(1,827)**	**(3,207)**	**(3,946)**
Water Bank Activity and Balances	**Year 5**	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**36,411**	**56,768**	**69,318**	**77,499**
Supplies Transferred to (from) Water Bank	(299)	(1,827)	(3,207)	(3,946)
AVEK Call Water (assumed to be zero in single-dry years)	0	0	0	0
Net Transfers to (from) Water Bank	**(299)**	**(1,827)**	**(3,207)**	**(3,946)**
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance (reserve supply)	**36,112**	**54,941**	**66,111**	**73,553**

AVEK: Antelope Valley – East Kern Water Agency

All values are subject to rounding.

Source: Psomas 2017a.

TABLE 5.18-12
WATER SUPPLIES AND DEMAND IN A MULTIPLE-DRY YEAR PERIOD STARTING IN YEAR 3, YEAR 8, YEAR 13, AND YEAR 18 TO FULL BUILDOUT

DROUGHT STARTING IN YEAR 3					
			Dry Years		
Annual Sources and Uses of Water Supplies	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Supplies					
Table A: Tulare Lake (less 5% to AVEK)	813	813	165	221	331
Table A: Dudley Ridge (less 5% to AVEK)	1,117	1,117	227	303	454
Recycled Water	146	301	512	802	1,014
Return Flows	0	0	0	0	2
Groundwater	1,634	1,634	1,634	1,634	1,634
AVEK Table A Import	2,360	2,360	480	640	960
Total Supplies	*6,070*	*6,225*	*3,018*	*3,600*	*4,395*
Total Demand (including construction and plant establishment)	*869*	*1,956*	*2,470*	*2,890*	*3,313*
Supplies Transferred to (from) Water Bank	**5,201**	**4,269**	**548**	**710**	**1,082**
			Dry Years		
Water Bank Activity and Balances	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Beginning Water Bank Balance	**17,287**	**21,635**	**26,781**	**27,274**	**27,913**
Supplies Transferred to (from) Water Bank	5,201	4,269	548	710	1,082
AVEK Call Water (no delivery in drought years)	1,450	1,450	0	0	0
Net Transfers to (from) Water Bank	**6,651**	**5,719**	**548**	**710**	**1,082**
10% Loss for Current Year Additions	(2,303)	(572)	(55)	(71)	(108)
Ending Water Bank Balance (reserve supply)	**21,635**	**26,781**	**27,274**	**27,913**	**28,887**

AVEK: Antelope Valley – East Kern Water Agency

All values are subject to rounding.

Source: Psomas 2017a

TABLE 5.18-12 (CONT.)
WATER SUPPLIES AND DEMAND IN A MULTIPLE-DRY YEAR PERIOD STARTING IN YEAR 3, YEAR 8, YEAR 13, AND YEAR 18 TO FULL BUILDOUT

DROUGHT STARTING IN YEAR 8					
			Dry Years		
Annual Sources and Uses of Water Supplies	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Supplies					
Table A: Tulare Lake (less 5% to AVEK)	813	813	165	221	331
Table A: Dudley Ridge (less 5% to AVEK)	1,117	1,117	227	303	454
Recycled Water	1,296	1,529	1,818	2,031	2,308
Return Flows	14	36	67	105	160
Groundwater	1,634	1,634	1,634	1,634	1,634
AVEK Table A Import	2,360	2,360	480	640	960
Total Supplies	*7,234*	*7,489*	*4,391*	*4,934*	*5,847*
Total Demand (including construction and plant establishment)	*3,916*	*4,436*	*4,930*	*5,565*	*6,293*
Supplies Transferred to (from) Water Bank	**3,318**	**3,053**	**(539)**	**(631)**	**(446)**
			Dry Years		
Water Bank Activity and Balances	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Beginning Water Bank Balance	**40,980**	**45,270**	**49,323**	**48,784**	**48,153**
Supplies Transferred to (from) Water Bank	3,318	3,053	(539)	(631)	(446)
AVEK Call Water (no delivery in drought years)	1,450	1,450	0	0	0
Net Transfers to (from) Water Bank	**4,768**	**4,503**	**(539)**	**(631)**	**(446)**
10% Loss for Current Year Additions	(477)	(450)	0	0	0
Ending Water Bank Balance (reserve supply)	**45,270**	**49,323**	**48,784**	**48,153**	**47,707**

AVEK: Antelope Valley – East Kern Water Agency

All values are subject to rounding.

Source: Psomas 2017a

TABLE 5.18-12 (CONT.) WATER SUPPLIES AND DEMAND IN A MULTIPLE-DRY YEAR PERIOD STARTING IN YEAR 3, YEAR 8, YEAR 13, AND YEAR 18 TO FULL BUILDOUT

DROUGHT STARTING IN YEAR 13					
			Dry Years		
Annual Sources and Uses of Water Supplies	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**
Supplies					
Table A: Tulare Lake (less 5% to AVEK)	813	813	165	221	331
Table A: Dudley Ridge (less 5% to AVEK)	1,117	1,117	227	303	454
Recycled Water	2,552	2,884	3,121	3,407	3,629
Return Flows	225	320	382	448	516
Groundwater	1,634	1,634	1,634	1,634	1,634
AVEK Table A Import	2,360	2,360	480	640	960
Total Supplies	*8,701*	*9,128*	*6,009*	*6,653*	*7,524*
Total Demand (including construction and plant establishment)	*7,760*	*7,668*	*8,139*	*8,872*	*9,350*
Supplies Transferred to (from) Water Bank	**942**	**1,460**	**(2,129)**	**(2,218)**	**(1,826)**
			Dry Years		
Water Bank Activity and Balances	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**
Beginning Water Bank Balance	**59,961**	**62,114**	**64,732**	**62,603**	**60,385**
Supplies Transferred to (from) Water Bank	942	1,460	(2,129)	(2,218)	(1,826)
AVEK Call Water (no delivery in drought years)	1,450	1,450	0	0	0
Net Transfers to (from) Water Bank	**2,392**	**2,910**	**(2,129)**	**(2,218)**	**(1,826)**
10% Loss for Current Year Additions	(239)	(291)	0	0	0
Ending Water Bank Balance (reserve supply)	**62,114**	**64,732**	**62,603**	**60,385**	**58,559**

AVEK: Antelope Valley – East Kern Water Agency

All values are subject to rounding.

Source: Psomas 2017a

TABLE 5.18-12 (CONT.)
WATER SUPPLIES AND DEMAND IN A MULTIPLE-DRY YEAR PERIOD STARTING IN YEAR 3, YEAR 8, YEAR 13, AND YEAR 18 TO FULL BUILDOUT

DROUGHT STARTING IN YEAR 18					
			Dry Years		
Annual Sources and Uses of Water Supplies	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Supplies					
Table A: Tulare Lake (less 5% to AVEK)	813	813	165	221	331
Table A: Dudley Ridge (less 5% to AVEK)	1,117	1,117	227	303	454
Recycled Water	3,903	4,124	4,345	4,577	4,577
Return Flows	580	623	713	794	862
Groundwater	1,634	1,634	1,634	1,634	1,634
AVEK Table A Import	2,360	2,360	480	640	960
Total Supplies	*10,407*	*10,671*	*7,564*	*8,169*	*8,818*
Total Demand (including construction and plant establishment)	*9,920*	*10,545*	*10,727*	*11,044*	*11,383*
Supplies Transferred to (from) Water Bank	**489**	**127**	**(3,163)**	**(2,874)**	**(2,565)**
			Dry Years		
Water Bank Activity and Balances	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance	**71,270**	**73,014**	**74,433**	**71,270**	**68,396**
Supplies Transferred to (from) Water Bank	489	127	(3,163)	(2,874)	(2,565)
AVEK Call Water (no delivery in drought years)	1,450	1,450	0	0	0
Net Transfers to (from) Water Bank	**1,939**	**1,577**	**(3,163)**	**(2,874)**	**(2,565)**
10% Loss for Current Year Additions	(194)	(158)	0	0	0
Ending Water Bank Balance (reserve supply)	**73,014**	**74,433**	**71,270**	**68,396**	**65,831**
AVEK: Antelope Valley – East Kern Water Agency					
All values are subject to rounding.					
Source: Psomas 2017a					

Documentation concerning the water supply sources summarized below is included as Appendices H through P of the WSA (Appendix 5.18-A).

Existing Banked Water. TRC purchased and has stored approximately 17,287 acre-feet of water in the TRC Water Bank for Project use. The stored water was conveyed from the California Aqueduct to the TRC Water Bank, released into the bank's percolation ponds, and infiltrated into the ground. TRC is storing the banked water for the benefit of the Project in accordance with an agreement between TRC and the Project Applicant (Appendix I of Appendix 5.18-A). Consistent with the Judgment and Physical Solution, 10 percent of the stored amount of water must be retained in the aquifer to supplement groundwater supplies and to account for infiltration and extraction losses.

Antelope Valley – East Kern Water Agency Call Water. AVEK is the primary SWP contractor for the Antelope Valley and sells SWP water to other districts and users throughout its service area. During 2008 and 2009, SWP supplies were severely constrained by drought conditions and regulatory limits affecting the operation of the SWP Delta pumps. To help alleviate the critical water shortage that was emerging in the Antelope Valley, TRC agreed to loan certain water supplies to AVEK for return in later years pursuant to two agreements. The remaining balance of water that AVEK is required to return to TRC under the agreements is 13,595 acre-feet. TRC has also participated in an in-lieu program administered by AVEK under which AVEK provides surface supplies in future wetter years in exchange for TRC using groundwater and foregoing SWP deliveries in prior dry years. The amount of water that AVEK is required to supply to TRC under the in lieu program is 13,032 acre-feet. In 2007 and 2008, TRC purchased 2,362 acre-feet of water from AVEK for future delivery. For ease of reference, these water supplies are collectively referred to as "AVEK Call Water" in this EIR. The total amount of AVEK Call Water available for Project use is 28,989 acre-feet. As shown in Table 5.18-10, the AVEK Call Water is used as part of the Project's reserve supply, and delivery is assumed to occur on a pro-rata basis over 20 average water years. The actual delivery timing can be flexibly arranged with AVEK to reflect the agency's available supplies from year to year. The water supply and demand projections assume that no AVEK Call Water would be supplied in either a single-dry year or during multiple-dry year droughts (see Table 5.18-11 and Table 5.18-12). Documentation concerning the AVEK Call Water is included in Appendices J, O, and P of Appendix 5.18-A.

Table A Water Transfers from the Tulare Lake Basin Water Storage District and the Dudley Ridge Water District. In 2008, TRC acquired the rights to approximately 1,451 afy of SWP Table A Amounts held by the Tulare Lake Basin Water Storage District (Tulare Lake) and subcontracted by Tulare Lake to GWF Energy, LLC and the Lurene Mattson Trust to meet general water needs on TRC property. In 2010, TRC also acquired the rights to approximately 1,993 afy of SWP Table A Amounts held by the Dudley Ridge Water District (Dudley Ridge) and subcontracted by Dudley Ridge to the 3-R Land and Development Company, LLC, the Friend Family Trust, the Don Jackson Family LLC, and the Donald Lee Jackson Revocable Trust. The transfer agreements are included in Appendices L and K of Appendix 5.18-A. In 2012, TRC and AVEK executed an assignment and import agreement under which the Tulare Lake and Dudley Ridge Table A Amounts were transferred to AVEK in accordance with SWP system rules and regulations, and AVEK agreed to import the supplies for Project use subject to cost reimbursement and the provision of five percent of the imported amounts for agency use (see Appendix 5.18-E).

As discussed in Section 5.18.4, SWP Table A water is subject to delivery variability due to weather, regulatory constraints, seasonal demand, and other factors. The availability of the Tulare Lake and Dudley Ridge transfer water for Project use is evaluated in this EIR by using the ELT scenario in DCR Appendix C developed for AVEK by the DWR (CNRA 2015) and the lower, more conservative single-dry year reliability rate of five percent to reflect 2014 conditions used in the AVEK 2015 UWMP. The 2015 UWMP projects that deliveries in an average or normal year will be 59 percent of Table A amounts; 5 percent of Table A amounts in a single-dry year; and 12 percent, 16 percent, and 24 percent of Table A amounts, respectively, in the three consecutive dry years in a multiple-dry year period. Under this scenario and accounting for AVEK's 5 percent supply retention in the TRC-AVEK import agreement, the Project would receive approximately 1,930 afy from the Tulare Lake and Dudley Ridge Table A Amounts in an average year (see Table 5.18-10), 164 afy in single-dry years (see Table 5.18-11) and from 392 to 785 afy in multiple-dry year droughts (see Table 5.18-12).

Table A water is subject to the terms of the SWP contracts between the DWR and the SWP contractors. Article 2 of the contract provides for a minimum term of at least 75 years, which generally extends through 2035 unless construction financing bonds or Project repayment terms require a longer period. Article 4 of the contract provides for renewal at the election of the contractor at the same amount, cost, conveyance, and quality as the prior contract. Article 4 also provides for similar renewal rights at the end of each succeeding term. The intent of these provisions is to provide SWP system participants with a stable, reasonably priced, reliable long-term source of water. According to the AVEK 2015 UWMP, the term of the SWP contracts is expected to be extended to December 31, 2085 (AVEK 2016). The consolidated and amended AVEK SWP contract, including Articles 2 and 4, is included in Appendix 518-E.

Antelope Valley – East Kern Water Agency Service Area Deliveries._The entire Project site and approximately 38,611 acres of TRC land are located within the AVEK jurisdictional boundaries and have been subject to AVEK annual water service assessments since the mid-1970s (Exhibit 5.18-6, Project Site and Tejon Ranch Company Land Ownership within the AVEK Service Area).

Section 61.1 of the AVEK Agency Law (California Uncodified Acts 9095, Sections 49–96) states that AVEK shall

> . . . whenever practicable, distribute and apportion the water purchased from the State of California or water obtained from any other source as equitably as possible on the basis of total payment by a district or geographical area within the agency regardless of its present status, of taxes, in relation that such payment bears to the total taxes and assessments collected from all other areas. It is the intent of this section to assure each area or district its fair share of water based on the amounts paid into the agency as they bear relation to the total amount collected by the agency.

TRC and AVEK executed a water services agreement in 1976 that provides for deliveries from AVEK to TRC in accordance with the agency's rules and regulations. The water services agreement is attached as Appendix 5.18-E. Since 1976, TRC has received approximately 79,000 acre-feet of water from AVEK (Appendix 5.18-E), including approximately 6,700 acre-feet received by TRC in 2006 and 2007. TRC has the right to request water deliveries from AVEK in the future in accordance with principles set forth in Section 61.1 of the AVEK Agency Law and under the water services agreement.

AVEK provides wholesale water to TRC, LACWWD40, and other Antelope Valley water districts and end users in its service area. Table 4-2 of the AVEK 2015 UWMP itemizes the Agency's projected future demands for wholesale water from 2020 to 2035 and includes TRC demand of 4,000 afy. All of this amount will be used by TRC to meet Project demand. The AVEK UWMP includes the recovery of up to 36,000 afy of water banked by AVEK in wetter years that will partially offset SWP delivery reductions during single-dry and multiple-dry years. Consequently, during drier periods, the UWMP indicates that more water would be available to AVEK to meet demand than from SWP supplies alone. To provide a conservative assessment and because the Project will be served by an on-site and TRC's existing off-site water banking facilities, the delivery reliability of the 4,000 afy of TRC demand identified in the UWMP is analyzed by assuming that only SWP water will be used to meet this demand. If AVEK uses non-SWP sources of supply in single-dry and multiple-dry years to meet TRC demand, delivery reliability in these drier years would be higher than projected.

As discussed above, the ELT scenario used in the 2015 UWMP includes an average or normal year delivery of 59 percent of Table A amounts; a single-dry year delivery of 5 percent of Table A amounts; and multiple-dry year period deliveries of 12 percent, 16 percent and 24 percent of Table A amounts. Assuming that all of the 4,000 afy of TRC demand in the UWMP was supplied from SWP water, the Project would receive approximately 2,360 afy in an average year (see Table 5.18-10), 200 afy in a single-dry year (see Table 5.18-11) and from 480 to 960 afy in multiple-dry years (see Table 5.18-12). As discussed above, Table A water is subject to the terms of the SWP contracts between the DWR and the SWP contractors, and the SWP contracts are expected to be extended to December 31, 2085 (AVEK 2016).

Imported Water Return Flows. The adjudication Judgment and Physical Solution provides that imported water used to meet urban demand in the Antelope Valley Basin may be recovered by the importing party in an amount equal to 39 percent of the average imported water use over the prior five years. As shown in Table 5.18-10, the amount of in-basin return flows attributable to the Project's imported water use will increase as the Project is developed and will mature five years after buildout. At full buildout in Year 20, in-basin return flows will be approximately 862 afy and will increase to a maximum of 1,034 afy by Year 25.

The Judgment and Physical Solution also allows for the production of return flows generated by imported water use in the Antelope Valley Watershed surrounding the basin in an amount to be determined to the satisfaction of the watermaster. Portions of the Project site are located in the basin watershed, and imported water use in these areas would be expected to generate return flows that could be used to meet Project demand. The amount of any such return flows has not yet been quantified and no application has been made to the watermaster concerning the use of these potential supplies. Consistent with the recommendations of the Peer Review Report, the analysis of Project water supply and demand does not include return flows that may be generated by imported water use in the Antelope Valley Watershed surrounding the basin (Kennedy/Jenks 2017). In the event the watermaster approves the production water return flows generated by imported water use in the basin watershed, the Project's water supplies will be higher than projected.

Groundwater. As discussed above, TRC is a party to the Judgment and Physical Solution entered by the Superior Court in the Antelope Valley groundwater adjudication. Exhibit 4 to the Judgment and Physical Solution allocates overlying production rights to groundwater in amounts consistent with the basin's total sustainable yield. The adjudication Judgment and Physical Solution, including Exhibit 4, is included in Appendix 5.18-D. Following a seven-year rampdown period applicable to all basin groundwater users, TRC has been allocated an overlying production right of 1,634 afy. All of TRC's overlying right allocation will be provided to and utilized by the Project. As discussed above, groundwater production in accordance with the Judgment and Physical Solution is considered to be highly reliable from year to year and unaffected by single-dry or multiple-dry year conditions (RWMG 2013).

Water quality samples indicate that groundwater in the Project area is suitable for potable use. Total dissolved solids (TDS) concentrations in several shallow and deep wells analyzed by Geosyntec in 2007 were approximately 318 milligrams per liter (mg/L) and hydrogen potential (pH) levels were neutral at 7.5. Iron and manganese were not detected in the samples. Nitrate concentrations were measured at 12.6 mg/L (as nitrate), which is below the applicable maximum contaminant level (MCL) drinking water standard of 45 mg/L. The boron concentration was 0.26 mg/L compared with the California Department of Public Health Action Level of 1 mg/L (Geosyntec 2007). Arsenic was detected in a deep local aquifer at approximately 11.9 micrograms per liter (μg/L), which is above the State and federal MCL of 10 μg/L. No other metals, including total chromium, were detected above applicable MCL standards. Chromium-6 was detected at a very low level (0.5 μg/L) in one well sample taken in 2005 (GEI 2010, 2005). None of the deep aquifer groundwater samples contained detectable concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), asbestos, total and fecal coliform bacteria, e. coli bacteria, 1,2,3-trichloropropane, or 1,2-dibromoethane (Geosyntec 2007).

Water quality tests performed by GEI in 2010 focused on the deep aquifer that would serve the Project and were consistent with the 2007 sampling results. TDS levels ranged from 310 to 320 mg/L, well below applicable standards. The results also indicate the presence of coliform bacteria and odor at the applicable MCL of 3.0 threshold odor number (TON). These results are typical for wells that are used for agriculture and well water that is not disinfected or treated for potable use. Standard chlorine disinfection, ultra-violet (UV) light disinfection or, if needed, physical cleaning by either scrubbing or brushing, followed by disinfection would meet applicable potable water standards for these characteristics (GEI 2010). Arsenic was observed in one well at 13 μg/L (higher than the applicable MCL of 10 μg/L) and at 8.9 μg/L in a second location. Further aquifer sampling will be conducted prior to Project residential, commercial, or employment-related groundwater use to verify these results. The analysis data will be reviewed by the California Department of Public Health (CDPH) Drinking Water Program to confirm that constituent levels comply with federal and State drinking water standards. If elevated arsenic levels are confirmed in subsequent water quality analyses, the Project will implement an integrated treatment approach to ensure that arsenic concentrations in potable water are maintained at applicable levels for potable water, including the following potential measures:

- *Well Screening to Exclude Arsenic-Containing Sediments.* Public water suppliers in the Antelope Valley, including LACWWD40, have demonstrated that arsenic concentrations in well water can be significantly reduced by installing screens that isolate soils or well zones where arsenic occurs. An isolation strategy will be evaluated and deployed to reduce potential arsenic concentrations in well water serving the Project to the extent feasible (Psomas 2011; DWR 2009).
- *Blending.* Potable water will be conveyed to and treated in a central water treatment facility, including well extractions and SWP supplies (see Exhibit 4-13, Centennial Project – Conceptual Domestic Water System). Depending on the annual and seasonal availability of SWP supplies (which typically contain arsenic concentrations that range from 1–4 ppb), well and SWP water can be blended in the facility to meet the arsenic MCL requirements (Psomas 2011; DWR 2009).
- *Ion Exchange Process.* Ion exchange is a USEPA-approved technology for the removal of arsenic from potable water supplies. An application of the technology developed by Envirogen, a commercial treatment system supplier, has been documented to be effective in reducing arsenic to non-detect levels in a plant operated by the Victorville Water District (VWD) under conditions similar to Antelope Valley and the Project area. The ion exchange process uses an adsorptive media such as iron oxide that bonds arsenic to the surface of the media in a staggered bed design. Water is passed through the media, where the arsenic is bonded and captured, and the purified water is then conveyed for further use. In 2002, VWD treated approximately 127 million gallons of well water using a mobile, 1,000 gallon per minute (gpm) Envirogen facility to non-detect levels. Approximately 99.94 percent of the treated water was recovered for potable use. Based on these results, VWD contracted with Envirogen to install a full-scale, centralized 6,000-gpm arsenic removal facility that will treat groundwater extracted from 5 wells. Envirogen has also operated 4 similar permitted units during the last 5 to 6 years with treatment capacities ranging from 1,200 to 8,000 gpm and recovery rates for treated product water averaging 99.90 to 99.94 percent. These units are located in Victorville, California (one unit treating water from the La Mesa Well); Mecca, California (two units treating water from Well 6806 and Well 7802); and one unit in Gilbert, Arizona. The Victorville, Mecca, and Gilbert installations show that ion exchange technology does not generate a significant wastewater stream and effectively removes arsenic from potable water supplies. The primary disposal requirements associated with the technology include the filtration media and solids suspended in the media. Assuming arsenic occurs in Project-serving groundwater at the highest tested level of approximately 13 μg/L, treatment to meet buildout demand could generate approximately 90 pounds of arsenic in a normal year and approximately 200 pounds of arsenic in a single-dry year. Disposal options include (1) disposal

at dedicated regeneration locations; (2) cleaning in a dedicated on-site facility that would remove the arsenic and other solids from the adsorptive media and transporting the solids for disposal at USEPA-approved regional facilities, such as the Harbors Environmental Services in Wilmington, California; or (3) transporting the adsorptive media and solids for cleaning and disposal at the Wilmington or a similar, USEPA-approved facility (Psomas 2011; DWR 2009).

Additional treatment technologies currently exist (e.g., reverse osmosis) that can supplement the treatment approach if required to meet the arsenic concentration objectives. Future techniques may be also be developed that could treat arsenic in a more cost-effective manner and reduce treatment wastes. The treatment facilities will be managed to allow for the systematic consideration and evaluation of available arsenic filtration technologies over time to ensure that applicable arsenic concentration levels are maintained and to reduce treatment wastes to the maximum extent feasible.

Recycled Water. Wastewater will be collected and treated to unrestricted reuse standards in accordance with Title 22 of the *California Code of Regulations.* The on-site distribution system will provide recycled water for outdoor irrigation and for 30 percent of indoor business park demand. Dual plumbing will also be installed to meet irrigation needs along the outer portions of very low density and low density residential lots with an area of at least 7,000 square feet.

The Project's proposed recycled water use is consistent with the Recycled Water Policy adopted in 2009 by the State Water Resources Control Board (Resolution No. 2009-0011). The Recycled Water Policy goals include (1) increasing statewide use of recycled water over 2002 levels by at least one million afy by 2020 and by at least two million afy in 2030 and (2) substituting as much recycled water for potable water as possible by 2030. To facilitate these goals, the Recycled Water Policy provides direction to each RWQCB regarding the appropriate criteria for issuing recycled water use permits to streamline the recycled project permitting process. At buildout, approximately 4,577 afy of recycled water will be used to meet 40 percent of total Project water demand.

Project Buildout Water Supply and Demand Projections

This section discusses buildout supply and demand during average (normal), single-dry, and multiple-dry years over a 20-year projection in conformance with Section 10910(c)(3) of the *California Water Code.* The projections incorporate the ELT scenario 82-year hydrologic projections used by AVEK in the 2015 UWMP (AVEK 2016).

Tables 5.18-10 through 5.18-12 provide buildout supply and demand projections during average, single-dry and multiple-dry years. The average year projections use the ELT long-term average reliability factor of 59 percent in the AVEK UWMP for SWP supplies. Single-dry year projections are presented in five-year increments and assume SWP deliveries will be five percent of Table A Amounts, the level used in AVEK's UWMP. Multiple-dry year projections are presented in five-year increments with the first two years shown as normal years and the last three years as a dry period or drought. Consistent with the ELT scenario and the AVEK UWMP, three-year drought period annual delivery rates used in the analysis are 12 percent, 16 percent, and 24 percent of the applicable SWP Table A amounts.

The projections show that Project supplies are sufficient to meet buildout demand for the 20-year analysis period and on a sustainable basis after buildout. The average year analysis in Table 5.18-10 is extended to Year 25 to provide projections up to the time when in-basin return flows fully mature. Project reserve supplies reach a maximum annual average volume of more than 79,000 acre-feet by Year 25 and would increase over time as return flows mature, and available supplies would, on average, exceed supplies in future years. Tables 5.18-11 and 5.18-12 show that stored water will be sufficient to meet demand when imported water supplies are limited both in single-dry years and multiple-dry years during and after Project buildout.

Water Use Monitoring and Reporting Requirements

The Specific Plan Green Development Program requires that the Project Water Purveyor meter all Project water use and provide the County with two water use reports. The first report must be submitted to the County at the end of the 5th year following first occupancy or occupancy of the 4,000th dwelling unit, whichever occurs latest. The second report must be provided to the County at the end of the 10th year following first occupancy or occupancy of the 10,000th dwelling unit, whichever occurs latest.

The purpose of the reports is to verify that the projected rates of potable and recycled water use for residential, CII, irrigation, and other purposes are being achieved and that available water supplies are sufficient to meet future demand after approximately 25 percent and 50 percent of the Project is completed. If the water use documented in a water use report exceeds projected levels, the Project Water Purveyor must implement response measures to reduce water consumption, such as modifying the water budget based rates in accordance with applicable laws, surcharges, additional enforcement, or water system repairs or upgrades. If required, the response measures could also include securing supplemental water, including the following potential water sources:

- **Imported Water Return Flows from Basin Watershed Use.** As discussed above, subject to the submission of an engineering report and approval by the watermaster, the Judgment and Physical Solution allows for the production of return flows generated by imported water use in the Antelope Valley Basin Watershed in addition to return flows from imported water use in the basin (see Appendix 5.18-D). Imported water will be used within the portions of the Project site that are outside the basin but within the basin watershed. If the return flows generated by this imported water use can be sufficiently quantified and approved by the watermaster, Project supplies would be augmented by this additional water source.
- **In-Basin Transfers.** The Judgment and Physical Solution for the Antelope Valley Basin allows for the transfer of overlying production rights from one party to another subject to watermaster approval (see Appendix 5.18-D). If required, supplemental supplies could be acquired from other parties pursuant to the Judgment and Physical

Solution and with watermaster approval in a manner that would avoid significant impacts to regional groundwater and groundwater users.

- **Antelope Valley – East Kern Water Agency Fee Program.** As summarized in the LACWWD40's 2015 UMWP, AVEK has implemented a fee program to facilitate obtaining additional imported water supplies to meet new demands in the region. The program requires payment to AVEK for each acre-foot of additional supply, and AVEK will use the funding to purchase water supplies that can be imported to the region using the SWP conveyance system. The fee program will likely focus on Table A transfers from other SWP contractors in accordance with the existing SWP contracts and DWR rules and regulations. AVEK acquisition of Table A transfers for fee program use would not generate additional impacts or require mitigation beyond the measures identified in the applicable SWP system environmental review process.
- **Additional Table A Transfers.** As discussed above, TRC acquired rights to 3,444 afy of Table A Amounts from Tulare Lake and Dudley Ridge for Project purposes. Additional Table A transfer opportunities may become available in the future. If available, Table A water secured for the Project would be transferred to AVEK's SWP account in accordance with applicable SWP contracts and rules and would be imported subject to an agreement with AVEK. Transfers of Table A Amounts would require the approval of the transferring SWP contractor, AVEK, and the DWR after appropriate environmental review. Project acquisition of additional Table A transfers would not generate additional impacts or require mitigation beyond the measures identified in the SWP system environmental review process.
- **Investment in Efficient Water Use Retrofit Programs or Additional Recycled Water Capacity for Existing Antelope Valley Users.** One or more water purveyors in the Antelope Valley may adopt a program under which additional water rights could be acquired by investing in water fixture retrofitting, new recycled water capacity, or other actions that reduce existing consumption in the region. It is likely that significant water savings could be achieved in existing residences, commercial and industrial buildings, or agricultural operations by replacing older fixtures and distribution equipment with modern, water-efficient facilities. Potable water demand could also be reduced by increasing the supply and delivery capacity of high-quality recycled water for irrigation in lieu of potable supplies. A regional water user could pay for applicable retrofits or capacity enhancements; establish the extent of reduced water consumption that results from the new facilities; and be credited with a supply equal to the net savings minus an applicable safety margin. Any such retrofit or recycled water program would be conducted in conjunction with regional water management programs designed to increase supply reliability and would be documented to ensure that net water savings were generated for the Antelope Valley. Other potential environmental impacts and mitigation measures that could be associated with a retrofit program would be evaluated by the applicable water purveyor or other implementing agency. No additional environmental review or mitigation would likely be required to participate in a retrofit or recycled water supply credit program approved by a local or regional water district or agency.
- **Storm Water Reuse.** The Urban Water Management Planning Act requires a consideration of storm water reuse as a potential future water supply. The

LACWWD40's 2015 UWMP indicates that certain districts in the Antelope Valley have considered or are implementing storm water reuse projects, including the Amargosa Creek Storm Water Runoff Recharge and Retention Basin project. It is possible that the Project could participate in the funding of these or similar regional storm water retention and reuse programs in exchange for rights to use a portion of the resulting additional supply. Regional programs would be subject to environmental evaluation and permitting by the applicable lead agency. Project participation in such efforts would not generate additional impacts or require mitigation beyond the measures identified by the Project's lead agency.

- **Desalination.** The Urban Water Management Planning Act requires a consideration of desalination as a potential future water supply. The Antelope Valley has no access to seawater and the 2015 AVEK UWMP states that desalination of brackish groundwater would add costs without increasing the Agency's supplies. The LACWWD40's 2015 UWMP indicates that, although there are no opportunities for the development of desalinated water in the district's service area, it may be possible for AVEK to partner with another SWP contractor, contribute financially to the construction of an ocean desalination facility, and obtain SWP water rights in exchange. Desalination facilities can involve potentially significant environmental impacts associated with brine disposal; with building and obtaining rights-of-way for water conveyance facilities; and with energy use. Due to cost and potential mitigation requirements, operating a desalination facility for Project use is not a feasible option. The Project could participate in the funding of a desalination project and SWP exchange program and acquire rights to use a portion of the resulting new supply. A desalination project coupled with an SWP water exchange would be subject to environmental evaluation and permitting by the applicable lead agencies. Project participation in a desalination program would not generate additional impacts or require mitigation beyond the measures identified by the lead agencies.

- **Other Potential Private or Public Water Sales.** Public or private entities may acquire rights to non-SWP water that can be transferred to the Project site by means of the California Aqueduct. The acquisition of sale and delivery rights from a seller, as well as the sale and transfer to the Project, would require appropriate agency approvals and environmental review. Water delivered to the Project site would also be required to meet applicable California Aqueduct water quality standards. Approvals from AVEK, the DWR, and other potential conveyance facility rights holders would be necessary to deliver third-party water through the California Aqueduct to the turnouts that serve the Project. In general, the conveyance of non-SWP water would occur on a lower priority than the conveyance of SWP supplies in the Aqueduct system, and transfers that rely on variable conveyance rights are more difficult to complete. A transfer relying on variable conveyance in the California Aqueduct would generally occur when there is surplus capacity and water would be stored until needed within the on-site and TRC water banks. Certain of the potential impacts associated with the purchase and conveyance of non-SWP supplies to and through the SWP system would be analyzed and mitigated in review processes undertaken by the participating water agencies. Additional impacts and mitigation measures could be associated with the transfer of water from the originating location, including the possibility of impacts to agriculture or other uses. The extent of these impacts and mitigation would depend on the locations from which the water was obtained and the pre-transfer uses of the transferred supplies and would be reviewed by the participating water agencies.

On-Site Water Supply Impacts

Based on the supply and demand projections discussed above and summarized in Tables 5.18-10 through 5.18-12, the Project's water supplies will be able to sustainably meet demand up to and following buildout with an average annual banked reserve of more than 79,000 acre-feet, or more than 11 years of full buildout potable demand. The Project's indoor and outdoor potable water use will be minimized by meeting and exceeding applicable State CALGreen Code and County Green Building Standards Code residential and non-residential equipment and water flow requirements. All Project landscaping and irrigation must conform to the plant palette and irrigation efficiency requirements in Section 3.4 of the Specific Plan. Outdoor water use will be consistent with the MWELO as amended in 2015. The projected annual residential per capita indoor and outdoor water demand of approximately 113 gpcd and total per capita water urban use of approximately 177.5 gpcd is consistent with the 2035 per capita water use rates projected by the County in the General Plan Update draft and final EIRs (142–199 gpcd) and the AVIRWRMP 2010 average water demand estimate of 199 gpcd and a conservative 10 percent reduction from the 2010 average level to meet the state's 20 percent urban water use reduction mandate (179 gpcd) (see Table 5.18-5).

As discussed above, the Project water supplies and demand analysis uses the recommended factors in the Peer Review Report submitted to the County (Kennedy/Jenks 2017). Certain of these factors, such as an assumed indoor residential use of 65 gpcd, are relatively conservative compared with recent studies, reported use by other water districts, and the State's current indoor residential standard of 55 gpcd. The analysis of Project supplies also does not include imported water return flows from basin watershed use that may be permitted by the watermaster in accordance with the Judgment and Physical Solution. Finally, the supply analysis does not assume that AVEK will use banked or groundwater supplies to meet the 4,000 afy of TRC demand incorporated into the AVEK UWMP during a single-dry or multiple-dry year. Consequently, the analysis of Project water supplies and demand includes conservative water use and supply assumptions.

The Project's use of groundwater and return flows from imported water in the Antelope Valley Basin and watershed areas will conform to the requirements of the adjudication Judgment and Physical Solution and will avoid significant impacts to groundwater supplies. High quality recycled water will be produced and distributed on site to meet 40 percent of buildout demand, including outdoor irrigation and for indoor wastewater and cooling in the business park. The use of recycled water is consistent with California and County policies that encourage increased municipal and industrial recycled water supplies.

Available SWP supplies include imported water secured and transferred to AVEK for importation and Project use and service area deliveries to TRC incorporated in Table 4-2 of the Agency's 2015 UWMP. The existing TRC and proposed on-site water banks allow for the wet-year storage and dry-year use of AVEK and other deliveries, which significantly increases the overall reliability of both regional and Project water supplies. The TRC Water Bank is a preexisting facility that will continue operations under the adjudication Judgment and Physical Solution. The proposed water bank will be operated in conformance with a storage agreement with the adjudication watermaster.

Potentially significant water supply impacts could occur if on-site water use exceeds projected levels or if SWP delivery reliability is lower than projected. If water use is less efficient than projected, demand could exceed supply in the latter of the Project's buildout years (see Table 5.18-12). If the annual average SWP delivery reliability is lower than estimated, less imported water would be available to meet Project demand from the secured Table A sources under the TRC-AVEK agreement and from the service area deliveries to TRC incorporated into the 2015 UWMP.

Mitigation Measure (MM) 18-1 and MM 18-2 will reduce these potential impacts to less than significant levels. MM 18-1 requires implementation of the water efficiency measures included in Part 2B of the Specific Plan's Green Development Program and the water conservation measures included in PDFs 18-1, 18-2, and 18-3. These measures will result in the installation of residential and non-residential water fixtures, irrigation, and other equipment that will exceed applicable State CALGreen Code and County Green Building Standards Code standards; will ensure that landscaping demand conforms to the more stringent of the MWELO or County standards; and will ensure that approximately 40 percent of total Project demand will be met by using recycled water. MM 18-1 also requires that the Project's on-site water use be monitored at all times. Finally, MM 18-1 requires that the Project Water Purveyor implement water budget based rates that reflect all applicable legal requirements to provide pricing incentives for meeting and exceeding projected levels of demand. The rates will be based on the projected indoor and outdoor water use factors summarized Table 5.18-7 except for indoor residential water use, which will incorporate the more stringent of the 55 gpcd standard in the recent multi-agency framework report (DWR et al. 2016b) or subsequent standards that may be implemented by the State or County. As shown in Table 5.18-7, residential indoor water use accounts for approximately 61 percent (4,161 afy of 6,788 afy) of the Project's full buildout potable water demand. The incorporation of a lower indoor residential use standard than assumed in the analysis in the water budget based rates will provide additional assurance that the Project demands will meet or exceed projected levels.

MM 18-2 requires implementation of water use monitoring and reporting, as described in Part 2B of the Specific Plan's Green Development Program and PDF 18-4, including the submission of water use reports to the County at the end of the 5^{th} and 10^{th} years or the occupancy of the $4,000^{th}$ and $10,000^{th}$ units, whichever occurs latest. The reports will utilize metering data to determine whether the water use efficiencies summarized in Table 5.18-7 are being achieved as the Project is built and that available water supplies are sufficient to meet future demand. If a report determines that water use is exceeding projected levels, the Project Water Purveyor must identify specific response measures to ensure that water supplies will meet future demand. These measures may include modified water-budget based rates to encourage lower water use in conformance with applicable legal requirements; enforcement; system repairs or upgrades to reduce losses and increase efficiency; or securing new water sources.

MM 18-1 and MM 18-2 ensure that Project's water efficiency will be achieved and that water supplies will be confirmed in reports that utilize on-site metering data after approximately 25 percent and 50 percent of the proposed Project has been built. If required, the Project Water Purveyor must identify and implement response measures that will ensure that available supplies will meet future demand. No subsequent development may occur until the County is satisfied that water supplies are sufficient to meet future demand. Potential impacts related to water use efficiency and water supply reliability will be reduced to less than significant levels with the incorporation of MM 18-1 and MM 18-2.

Off-Site Impacts

As shown on Exhibit 4-13, Centennial Project – Conceptual Domestic Water System, in Section 4.0, Project Description, certain components of the Project's water infrastructure would be located outside the Project site. These infrastructure components include extraction wells; water conveyance pipelines; and related piping, control structures, and electrical power systems. The operation of the off-site groundwater extraction wells and related water conveyance pipelines and systems do not impact Project water supplies because these systems are necessary to implement the proposed domestic water system.

The impacts of constructing off-site water infrastructure are described in the respective technical sections of this EIR (e.g., biological resources, land use). The operational impacts from using these off-site infrastructure systems are also described in the respective technical sections (e.g., air quality, utility systems) of this EIR. The construction of off-site systems will not result in significant impacts to water supplies.

<u>Impact Summary</u>: On-site water supply impacts will be less than significant with the incorporation of mitigation measures MM 18-1 and MM 18-2. The construction of off-site systems will not result in significant impacts to water supplies and no mitigation is required.

Threshold 18-2 **Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?**

On-Site and Off-Site Impacts

The Project's use of groundwater and return flows from in-basin imported water use is regulated by the terms and conditions of the adjudication Judgment and Physical Solution. The Judgment and Physical Solution incorporates and implements a judicial determination of the total sustainable yield of the Antelope Valley aquifer and limits the use of native supplies and imported water return flows to levels that will allow for the sustainable use of groundwater, including the avoidance of overdraft conditions. Groundwater use in accordance with the Judgment and Physical Solution would not result in a lowering of local groundwater to levels that would impact the production rate of pre-existing nearby wells and would not cause groundwater to drop to levels that would not support existing or planned land uses. Consequently, Project groundwater and return flow use would not significantly impact groundwater levels and no mitigation is required.

The Project's potential impacts to groundwater recharge are discussed in more detail in Section 5.2, Hydrology and Flood, and Section 5.4, Water Quality. Project development would not interfere substantially with groundwater recharge to the extent of causing a net deficit in aquifer volume or a lowering of the local groundwater table. Under existing conditions, the Project is located in a watershed of approximately 39,600 acres, of which approximately 36,660 acres, including most of the Project site and the surrounding watershed, drains to the Antelope Valley Groundwater Basin. No surface water flows will be redirected to other watersheds under post-development conditions. Under existing conditions, approximately 3,308 acre-feet of runoff to the basin is generated from the Project site during a 50-year storm event, excluding flows from the site west toward Gorman Creek. At buildout, approximately 4,362 acre-feet of runoff to the basin would be generated from Project areas during a 50-year storm event. The increase in runoff volume is related to the reduction of permeable areas due to development (Psomas 2017b).

To ensure that no loss of groundwater recharge potential in the basin would occur, the Project will construct and maintain 26 storm water infiltration basins with a total storage capacity of approximately 2,229 acre-feet in alluvial, low-lying locations of the site. The basins are typically located adjacent to or within natural drainages and in development areas in the flatter eastern areas of the Project site. Natural soil conditions are better suited for infiltration in these locations and promote effective infiltration. Each basin has been sized to impound water at depths of approximately six to eight feet and to discharge within a maximum of four days. The short draw-down time minimizes evaporation losses and maximizes groundwater recharge. The depth of stored water promotes infiltration by reducing the surface area of ponded water and lowering evaporation losses below the level that occur under existing site conditions. The basin system will also intercept low flow discharges during the summer months, which will incrementally add to overall groundwater recharge volumes. Basin performance will be monitored and maintenance will be performed as required to maintain the planned infiltration rates (Psomas 2017b). The Project's runoff management and basin system is discussed in more detail in Section 5.2, Hydrology and Flood.

Project runoff volume would increase from impervious surfaces introduced by development. On-site basins will capture and infiltrate this runoff to maintain existing peak flow rates and volumes during storm events at off-site discharge locations (see Section 5.2, Hydrology and Flood). Most of the basins are located in the eastern portions of the site that contribute surface flows and groundwater recharge to the Antelope Valley Basin. As a result, Antelope Valley Basin recharge rates would either be unaffected by or could potentially increase as a result of Project development.

<u>Impact Summary</u>: There would be a less than significant impact to groundwater supplies, groundwater recharge rates, groundwater levels, and to existing and potential future well uses; no additional mitigation is required.

5.18.7 MITIGATION MEASURES

MM 18-1 In addition to complying with the water efficiency and conservation set forth in Divisions 4.3 and 5.3 of the California Green Building Standards (CALGreen) Code or the County Green Building Standards Code, whichever are more stringent, the Project Applicant/Developer shall implement the measures listed below.

Meter Water Use. Install, maintain, and monitor all non-construction potable and non-potable water use using appropriate metering equipment throughout the site.

Reduce Potable Water Use with On-Site Recycled Water. Install, maintain, and operate on-site wastewater treatment and conveyance facilities that provide recycled water treated to California Title 22 unrestricted reuse standards from on-site wastewater. Recycled water shall be used to meet (i) 100 percent of commercial, business park, institutional, school, hotel, park, and slope irrigation demand and (ii) outdoor irrigation demand in 50 percent of the total very low and low density residential lot landscaped area.

Water Efficient Appliances. Require installation of water-efficient major appliances (washers, dryers, dishwashers) in compliance with the California Appliance Efficiency Regulations, Energy Star®, or other applicable standards.

Water Efficient Irrigation. Require the installation of irrigation equipment with a minimum 0.80 irrigation efficiency for all public and private park, recreation and entertainment land use, arterial roadway, and slope irrigation uses. Water Smart/Evapotranspiration-based controllers shall be used. Low water use plants and shrubs shall be used in all irrigated slope areas with an average plant factor of 0.2, as defined in the State Model Water Efficient Landscape Ordinance.

Water Budget Based Water Rates. Require that the Project Water Purveyor implement water budget based rates in compliance with all applicable legal requirements and in a manner consistent with the use of such rates by other water districts in California (e.g., Irvine Ranch Water District). The water budget based rates shall incorporate and be designed to ensure that Project potable water use meets or exceeds the following standards and adjusted as may be required to meet more stringent standards that may be adopted by the State or Los Angeles County:

1. *Indoor Water Use Standards*
   - (a) Residential indoor water use – 55 gallons per capita per day
   - (b) Commercial indoor water use – 200 gallons per day per thousand square feet
   - (c) Business Park indoor water use – 65 gallons per day per thousand square feet, including recycled water for commercial wastewater and cooling use except where prohibited by applicable law for particular types of areas or uses (e.g., employee cafeterias)

(d) Institutional indoor water use – 50 gallons per day per thousand square feet

(e) Hotel indoor water use – 125 gallons per day per room.

2. *Outdoor Water Use Standards*

(a) Residential outdoor water use – 55 percent of the reference evapotranspiration rate for the Project site

(b) Commercial, industrial, and institutional outdoor use – 45 percent of the reference evapotranspiration rate for the Project site

MM 18-2 The Project Applicant/Developer shall submit to the County Water Use Reports prepared by a qualified specialist to the satisfaction of the County to verify that the projected water use efficiencies are being achieved (1) at the end of the 5th year following first occupancy or occupancy of the 4,000th dwelling unit, whichever occurs later and (2) at the end of the 10th year following first occupancy or occupancy of the 10,000th dwelling unit, whichever occurs later. In the event that a Water Use Report indicates that consumption exceeds the projected levels, response measures must be implemented to ensure that available supplies will be sufficient to meet future demand. No further development will be approved until additional measures are implemented to achieve the required efficiencies and/or provide additional water supplies, as confirmed by the Project Water Purveyor. No subsequent Tentative Maps shall be approved until the Project Water Purveyor has demonstrated to the satisfaction of the County that the implementation of specific water demand and supply response measures will ensure that available supplies will meet future Project demand.

5.18.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts to water supply will be less than significant after mitigation. Potential groundwater impacts will be less than significant and no mitigation is required. The Project will contribute to a significant and unavoidable cumulative impact to regional water supplies.

5.18.9 REFERENCES

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