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Description:	This section discusses the existing water resources near the Darden Clean Energy Project, and potential impacts that the Project may have on these resources.
Filer:	Evelyn Langsdale
Organization:	Rincon Consultants
Submitter Role:	Applicant Consultant
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5.13 Water Resources

This section discusses the existing water resources near the Darden Clean Energy Project (Project). Section 5.13.1 describes the existing environmental conditions for water resources. Section 5.13.2 discusses potential environmental effects of project construction and operation on water resources. Section 5.13.3 presents analysis of cumulative project effects. Section 5.13.4 discusses proposed mitigation measures designed to minimize or avoid potentially significant impacts. Section 5.13.5 presents applicable laws, ordinances, regulations, and standards (LORS) related to water resources. Section 5.13.6 describes permits that relate to water resources, lists contacts with relevant regulatory agencies, and presents a schedule for obtaining permits. References used to inform this analysis are presented in Section 5.13.7. This section was informed in part by the water supply study prepared by Rincon Consultants, Inc. for the Project (Appendix S).

5.13.1 Environmental Setting

This section characterizes the environmental setting for water resources, including the following topics required in California Energy Commission (CEC) Appendix B:

- Groundwater resources and geologic structures (Appendix B Requirement (B)(i)) – see Section 5.13.1.1, *Groundwater*, including identification of groundwater wells within 0.5 mile of the Project site under "Nearby Wells" (Appendix B Requirement (B)(v));
- Surface water bodies (Appendix B Requirement (B)(ii)) – see Section 5.13.1.2, *Surface Water*;
- Flood control facilities, existing and proposed (Appendix B Requirement (B)(iii)) – see Section 5.13.1.3, *Stormwater*;
- Water inundation zones, such as the 100-year flood plain and tsunami run-up zones (Appendix B Requirement (B)(iv)) – see Section 5.13.1.4, *Flooding and Inundation*;
- Wastewater – see Section 5.13.1.5, *Wastewater*; and
- Water Supply – see Section 5.13.1.6, *Water Supply*.

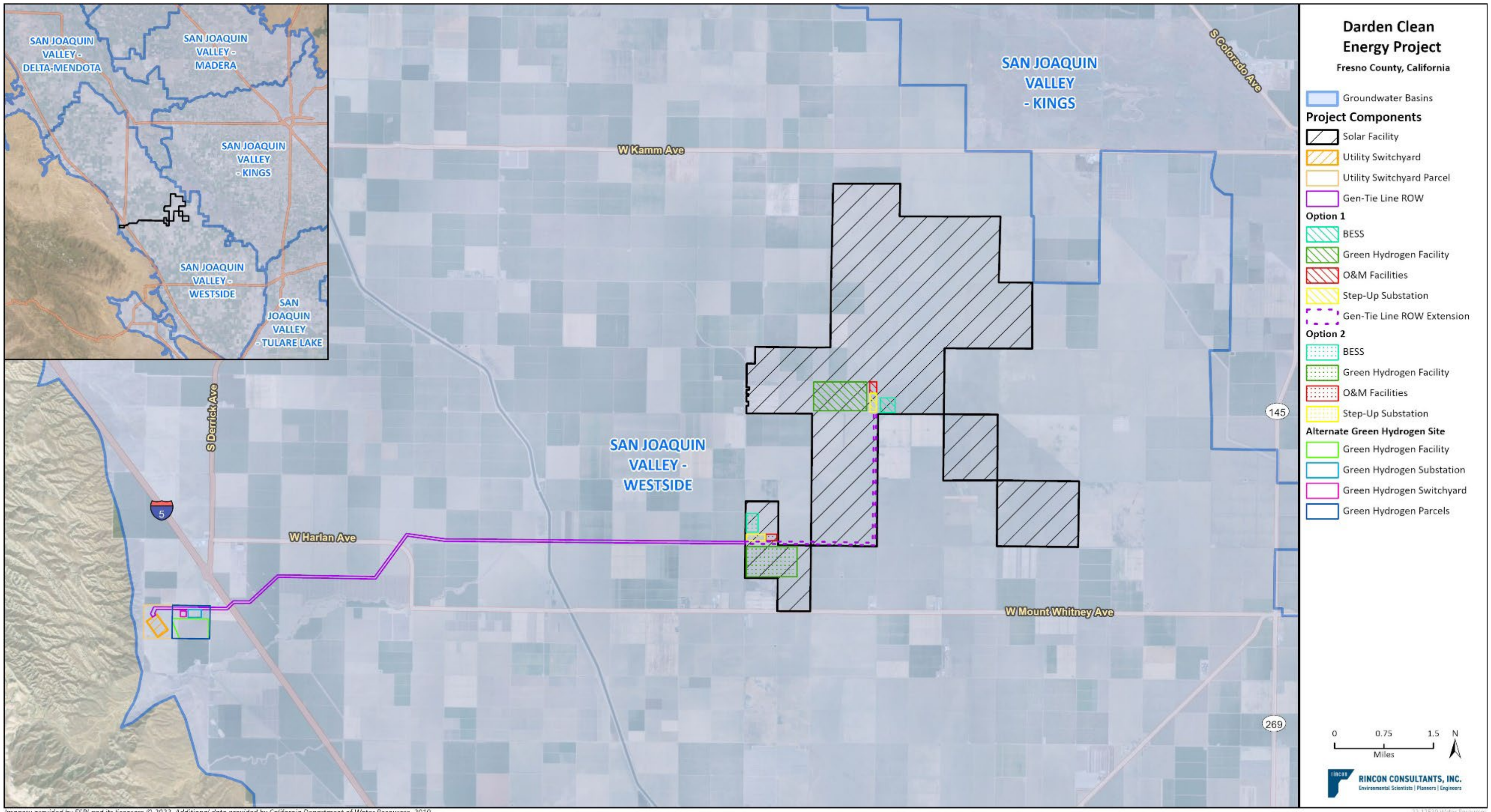
5.13.1.1 Groundwater

The Project site overlies the Westside Subbasin of the San Joaquin Valley Groundwater Basin (SJVGB). Figure 5.13-1, below, provides an overview of the Project site within the Westside Subbasin. No defined groundwater basins are west of the Westside Subbasin, which is bounded on the north, east, and south by other subbasins of the SJVGB.

Westside Subbasin

The Westside Subbasin covers 972 square miles (622,080 acres) in the western portion of the SJVGB and is designated by DWR as Critically Overdrafted (DWR 2023). When the Sustainable Groundwater Management Act (SGMA) was established in 2014, it described critical overdraft as follows: "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." Critical overdraft results when the average annual amount of groundwater extraction exceeds the long-term average of annual water supply to the basin. The effects of overdraft include groundwater depletion, chronic lowering of groundwater levels, and regional subsidence.

Figure 5.13-1 Groundwater Basins



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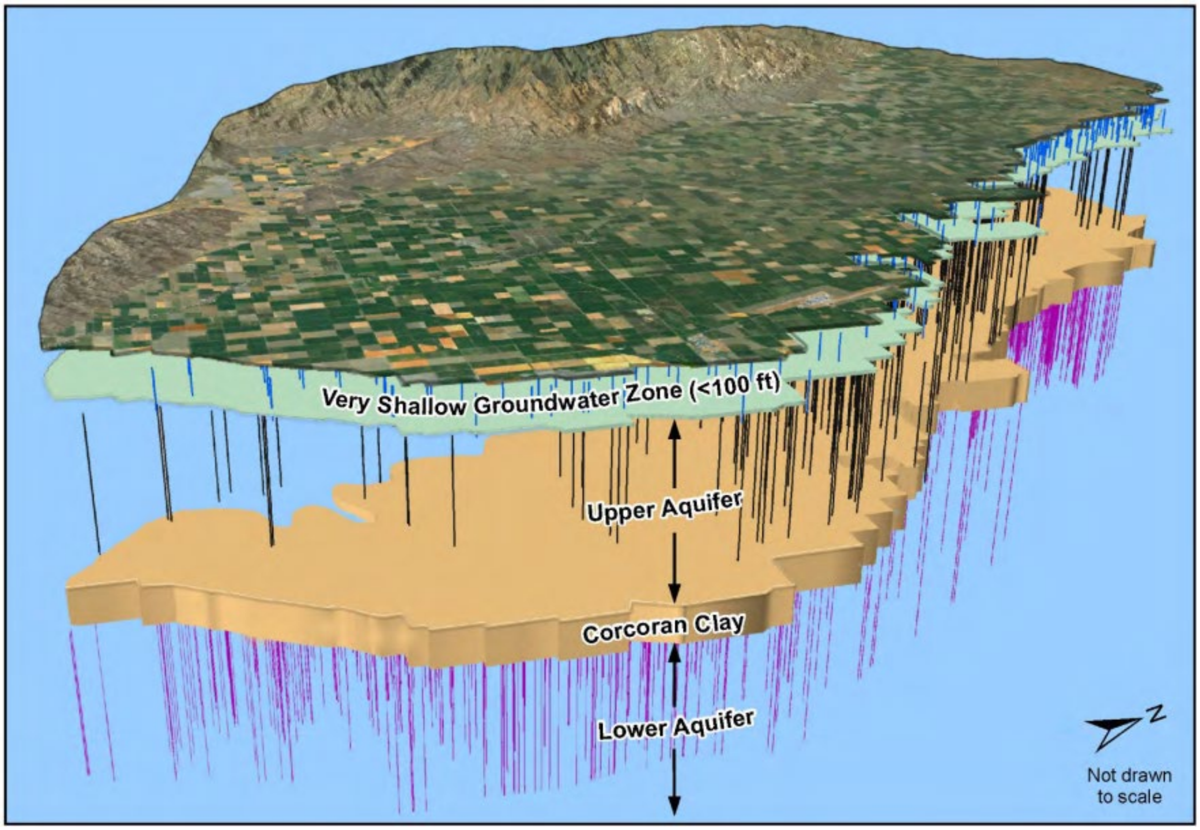
Aquifer System Overview

The reversal of overdraft to restore balanced conditions requires consideration of how water moves through the subsurface and what the barriers to movement are, so it can be anticipated how groundwater pumping in a certain area may affect other areas. In the Westside Subbasin, geologic units are deposited in four layers, identified in order of increasing depth as the Shallow Zone, Upper Aquifer, Corcoran Clay, and Lower Aquifer, as portrayed in Figure 5.13-2 and described below.

Figure 5.13-2 Westside Subbasin Cross-Section



Source: WWD GSA and County of Fresno GSA 2022a

The figure above shows the Shallow Zone occurring in the top 100 feet below the ground surface, followed by the Upper Aquifer, the Corcoran Clay layer, then the Lower Aquifer.

- **Shallow Zone.** The Shallow Zone consists of the first approximately 100 feet below the ground surface (bgs) and above the Upper Aquifer. As stated in the Westside Subbasin GSP (pages ES-3 and ES-4), the Shallow Zone is not hydrologically connected to the Upper Aquifer; therefore, it is not defined as one of the primary aquifer units in the Westside Subbasin (WWD GSA and County of Fresno GSA-Westside 2022a). The GSP further states (page ES-4), "Groundwater elevation in the upper most 100 feet are likely supported by recharge from irrigation, therefore, it is not defined as one of the primary aquifer units in the Subbasin." Groundwater modeling of the subbasin would provide clarity around the relationship between the Shallow Zone and Upper Aquifer, including the quantity of agricultural return flow to the Shallow Zone, the rate of replenishment, and whether there is any movement between the Shallow Zone and underlying aquifer layers, such as where the Corcoran Clay layer is very thin.

Most domestic wells in the Westside Subbasin are either constructed in the Upper Aquifer or extend through the Upper and Lower Aquifers, with the Shallow Zone sealed to prevent downward movement of poor-quality irrigation recharge water into the underlying aquifer layers (WWD GSA and County of Fresno GSA-Westside 2023a).

- **Upper Aquifer.** The Upper Aquifer is a defined water-bearing zone that lies below the Shallow Zone and above the Corcoran Clay of the Westside Subbasin. The Upper Aquifer consists of sedimentary deposits which are generally western-sourced, alluvial fan deposits considered part of the upper Tulare Formation, although it is difficult to separate this formation from overlying younger alluvium. The Upper Aquifer is characterized by poor water quality, which is the primary reason that groundwater pumping has historically been approximately 10 percent less in the Upper Aquifer than the Lower Aquifer (WWD GSA and County of Fresno GSA-Westside 2022a). Water quality constituents in the Upper Aquifer include total dissolved solids (TDS), boron, selenium, arsenic, and sulfate. Groundwater quality in the Upper Aquifer generally exceeds the upper limit of the secondary maximum contaminant level (MCL) for TDS of 1,000 mg/L in most areas.
- **Corcoran Clay.** The Corcoran Clay layer is an extensive geologic unit that extends throughout most of the Westside Subbasin. It is comprised of low-permeability lacustrine (lake) deposit which forms a continuous clay layer and barrier to groundwater movement. The Corcoran Clay layer divides groundwater flow into an upper semi-confined zone (Upper Aquifer), described above, and a lower confined zone (Lower Aquifer), described below (USGS 2012). The depth to the Corcoran Clay generally increases from east to west, ranging from approximately 400 feet in the east to 800 feet in the west, and ranges in thickness from less than 20 feet to 100 feet (WWD GSA and County of Fresno GSA-Westside 2002a and 2022b). Generally, the Corcoran Clay is thinner in the southern portion of the subbasin compared to the northern portion. In the southwestern part of the subbasin, the Upper Aquifer lies directly on top of the Lower Aquifer without the confining bed of the Corcoran Clay being present.
- **Lower Aquifer.** The Lower Aquifer is located below the Corcoran Clay layer, separated from the Upper Aquifer except in the southwestern portion of the subbasin, where no horizontal barrier exists between the Upper Aquifer and Lower Aquifer. Most historic pumping in the Westside Subbasin has occurred in the Lower Aquifer. Geologic deposits in this layer source from both the Sierra Nevada to the east and the Diablo Range to the west. Records of groundwater levels for the Lower Aquifer date back to the 1950s, showing the greatest drawdown occurred during the 1950s and 1960s, and after 1968 dramatic increases to the amount of Lower Aquifer storage occurred due to introduction of imported surface water via the Central Valley Project (CVP), which reduced needs to produce local groundwater (WWD GSA and County of Fresno GSA-Westside 2022a). Groundwater levels in the Lower Aquifer remained relatively stable from the 1980s through the early 2000s, but have declined considerably since 2010, likely due to drought conditions that caused reduced surface water deliveries and greater reliance on groundwater.

Figure 5.13-3, below, portrays the depth to groundwater across the subbasin, showing that depth to groundwater is greatest along the foothills and decreases towards the valley floor; this is consistent with elevation changes and drainage patterns flowing towards the valley floor.

As shown above, depth to groundwater decreases from the western to eastern boundary of the subbasin. The Project site is approximately centered within the subbasin, and the depth to groundwater underlying the solar facility site would be approximately 200 to 300 feet.

The Upper Aquifer overlies the Corcoran Clay layer; Figure 5.13-4, below, shows the thickness of the

Corcoran Clay layer (note, this is thickness of the layer, not depth to the layer).

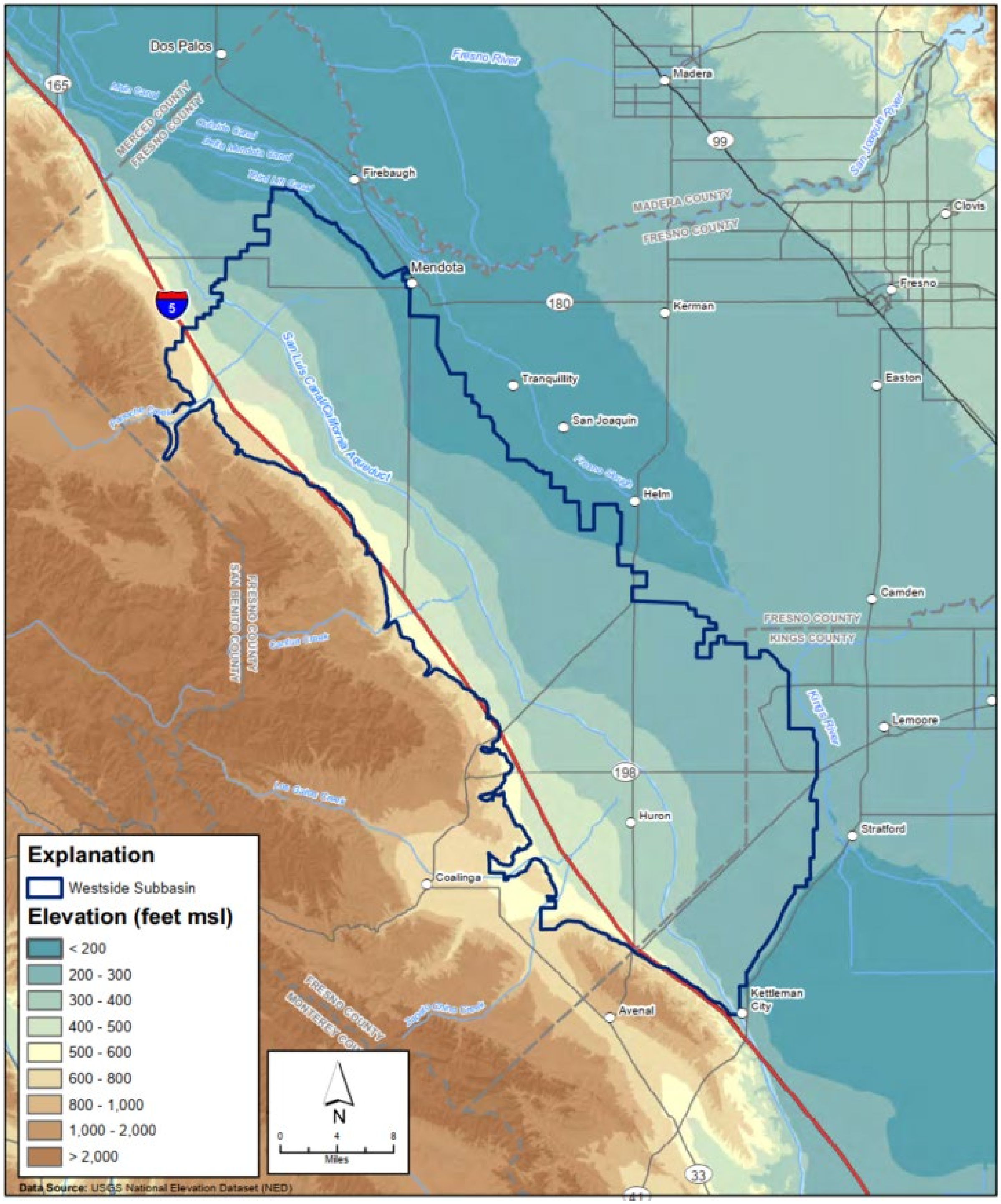
Figure 5.13-4 shows depth to the Lower Aquifer is greatest in the north-northwestern portion of the subbasin and lowest in the central-western and southern portions of the subbasin. The figure above conveys thickness, not depth to the Corcoran Clay layer; however, there is a direct correlation between the thickness of the Corcoran Clay layer and depth to the Lower Aquifer below. Where the Corcoran Clay layer is thicker, the depth to the Lower Aquifer is greater. Characteristics of the Corcoran Clay layer influence how and where groundwater occurs in the subbasin; in areas where the Corcoran Clay layer is thin or absent, there can be movement of water between the Upper Aquifer and Lower Aquifer, which affects TDS concentrations in the blending zone.

Groundwater in Storage

The amount of groundwater in storage does not represent the amount of groundwater available for use; rather, groundwater in storage can be used to measure basin balance over time. If a basin is in balanced conditions, the amount of inflow is equivalent to the amount of outflow, and the amount of water in storage would remain relatively constant over time. Quantification of the amount of inflow and outflow required to support sustainable (balanced) conditions in a basin can be used to create a water budget and identify the "sustainable yield," or the maximum amount of water that can be withdrawn annually without causing undesirable effects such as overdraft.

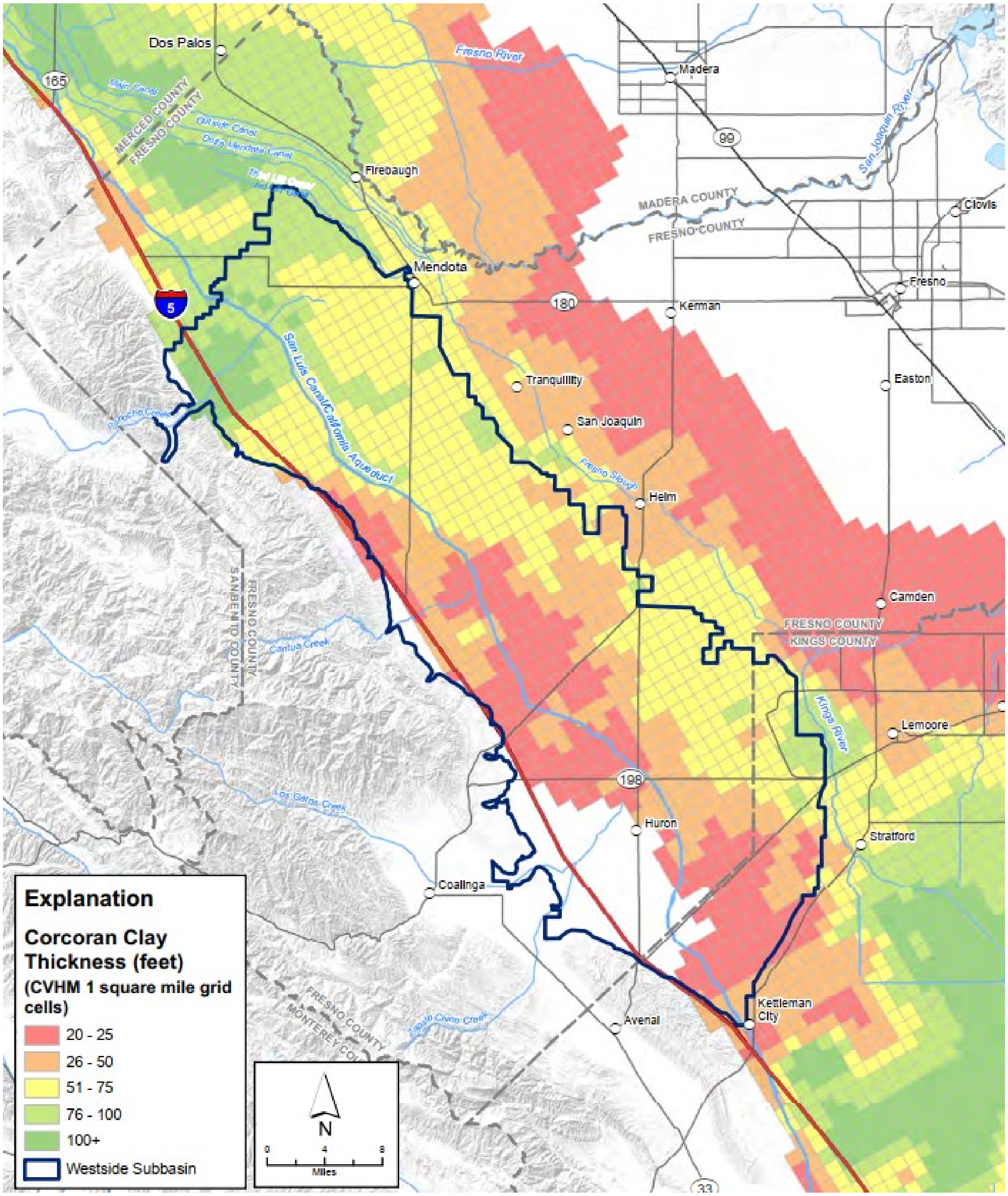
A water budget for the Westside Subbasin was developed to inform the Westside Subbasin GSP required for compliance with SGMA; see below under "Sustainable Groundwater Management Act," for further discussion of SGMA. The Westside Subbasin water budget was created using a numerical integrated groundwater flow model referred to as the Westside Groundwater Model (WSGM). The WSGM used an historical period of 1989 through 2015, with the current water budget year as 2016 and the projected water budget period spanned 2017 through 2070 (WWD 2022). The WSGM assessed three baseline scenarios, including: baseline with no climate change; 2030 climate change baseline; and 2070 climate change baseline (WWD 2022). The climate change baselines were developed by DWR as a guidance for evaluating hydrologic conditions under extreme climate conditions such as variable precipitation and increased temperatures (DWR 2018).

Figure 5.13-3 Depth to Groundwater



Source: WWD GSA and County of Fresno GSA-Westside 2022a

Figure 5.13-4 Corcoran Clay Thickness



Source: WWD GSA and County of Fresno GSA 2022a.

Results of the WSGM indicate that over the 27 years between 1989 and 2015, the amount of groundwater in storage in the Westside Subbasin declined by an average of 19,000 AFY, for a total decrease of groundwater in storage of 517,000 AF. This downward trend is consistent with the subbasin's status as Critically Overdrafted. However, the Westside Subbasin GSP states that although the subbasin is Critically Overdrafted, the total decline in storage represents less than four percent of total outflow from the basin, and less than six percent of total pumping from the basin, which suggests the budget is relatively balanced over the WSGM calibration period (WWD GSA and County of Fresno GSA-Westside 2022a). Table 5.13-1, below, provides historical and projected water budgets for the Westside Subbasin, as determined through the WSGM and presented in the GSP.

Table 5.13-1 Sustainable Yield Estimates

Use Type	Water Budget Period	Volume
Historical Groundwater Sustainable Yield	1989-2015	305,000 AFY
Projected Groundwater Sustainable Yield	2017-2070	270,000 - 294,000 AFY

Source: WWD GSA and County of Fresno GSA-Westside 2022a

The table above shows that during the historical period (1989-2015), sustainable yield for the Westside Subbasin was 305,000 AFY, meaning that up to 305,000 AFY could be withdrawn from the subbasin without causing undesirable effects such as overdraft. As discussed above, the subbasin was also consistently overdrawn by an average of 19,000 AFY over the modeled period. Therefore, sustainable yield under future conditions – to maintain basin balance – was determined to be a range of 270,000 AFY to 294,000 AFY through year 2070.

The actual sustainable yield rate for any given year depends upon the rate at which the subbasin is recovering from overdraft, as determined by groundwater inflows, pumping, replenishment, and subsequent amount of groundwater in storage. The extent of groundwater reliance (amount of pumping) during any given year depends upon hydrologic and climatic conditions, with heavier groundwater pumping occurring during years with reduced surface water availability, including imported CVP water. Table 5.13-2, below, shows changes in groundwater storage between 2016 and 2021, based on measured differences in seasonal high groundwater levels in the current and previous reporting years (WWD GSA and Fresno County GSA 2022a).

Table 5.13-2 Westside Subbasin – Change in Groundwater Storage (AF)

Aquifer	2016	2017	2018	2019	2020	2021	Total
Upper Aquifer	-23,000	21,000	32,000	-28,000	-9,000	-2,000	-9,000
Lower Aquifer	-138,000	-8,000	237,000	-55,000	78,000	-110,000	4,000
Total	-161,000	13,000	269,000	-83,000	69,000	-112,000	-5,000

Source: WWD GSA and Fresno County GSA 2022a

Data in the table above demonstrates that the actual amount of groundwater in storage in the Westside Subbasin varies every year. Overall, the change in groundwater storage was cumulatively negative (overdrafted) by 5,000 AF between 2016 and 2021; in comparison, the average rate of overdraft for the historical period of 1989 through 2015 was approximately 19,000 AFY. This difference indicates that some years and decades have more replenishment and less pumping, while the reverse is true in other years.

Groundwater Quality

The quality of surface and groundwater resources is managed by the State Water Resources Control Board (SWRCB), through its nine Regional Water Quality Control Boards (RWQCBs), with implementation of a Water Quality Control Plan (“Basin Plan”) across all hydrologic regions. The Project is located within the jurisdiction of the Central Valley Region, which implements two Basin Plans - the Sacramento and San Joaquin Rivers Basin Plan, and the Tulare Lake Basin Plan. The Project area is addressed in the Tulare Lake Basin Plan (Central Valley RWQCB 2018a).

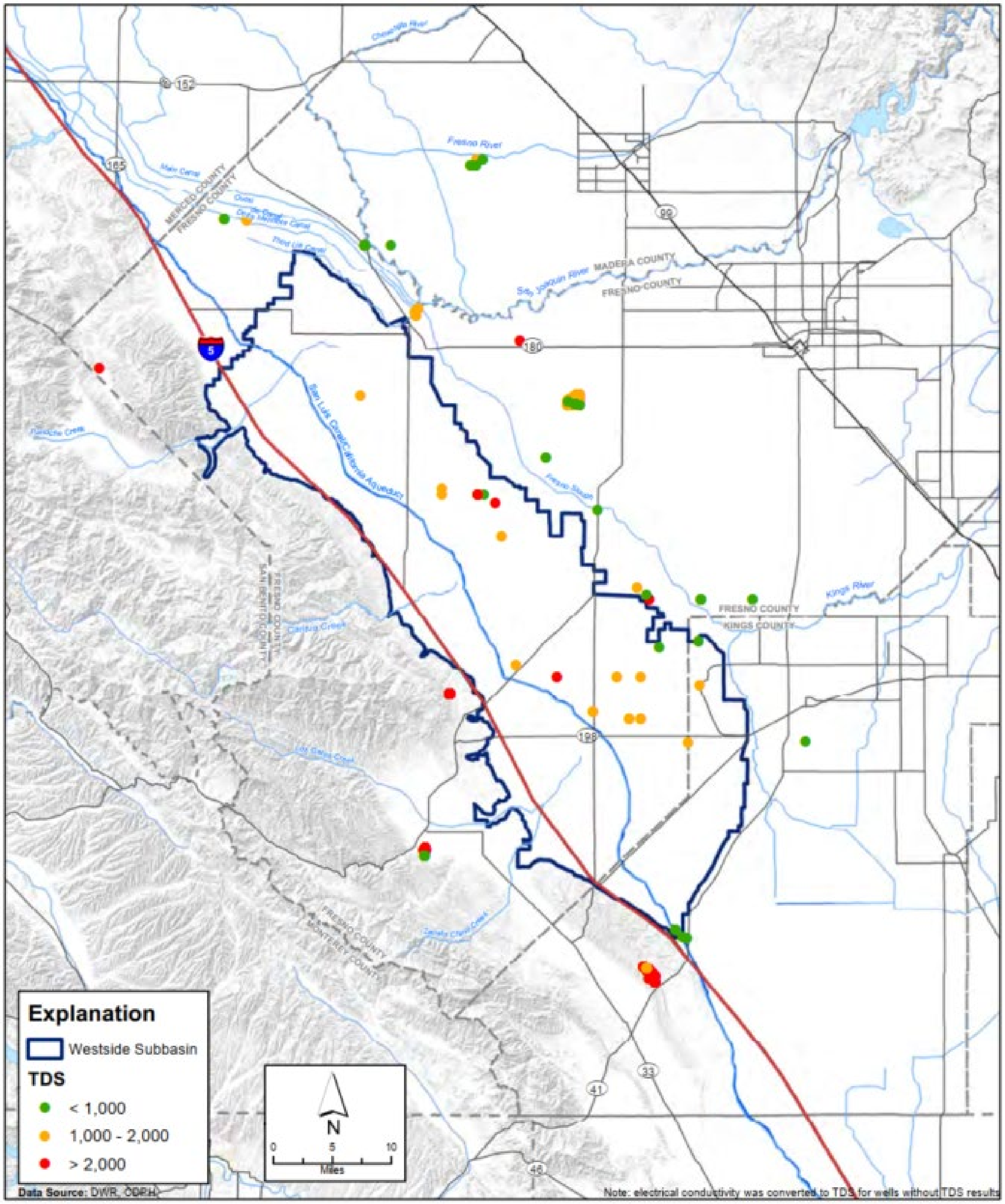
The Tulare Lake Basin Plan identifies water quality objectives for various constituents, including salinity. It also states that no proven means exist at present that would allow ongoing human activities to continue without increasing salinity concentrations; therefore, the water quality objectives for salinity focus on controlling the rate of increase (Central Valley RWQCB 2018b, Section 3.2.5). Figure 5.13-5 and Figure 5.13-6, below, portray TDS concentrations across the Upper Aquifer and the Lower Aquifer, respectively.

The figure above shows TDS concentrations in the Upper Aquifer exceed 2,000 mg/L at several locations in the central and northern portions of the subbasin. This figure also shows water quality in the Upper Aquifer exceeds the upper secondary MCL of 1,000 mg/L in most areas, except along the eastern subbasin boundary, where TDS is below 1,000 mg/L. Figure 5.13-6 shows water quality data for the Lower Aquifer, which is proposed for use under the Project.

The figure above shows that many areas of the Lower Aquifer are characterized by elevated TDS, with concentrations exceeding the secondary MCL of 1,000 mg/L across most of the subbasin. However, comparison with Upper Aquifer conditions in Figure 5.13-5 indicates that degraded water quality is less prevalent in the Lower Aquifer than in the Upper Aquifer.

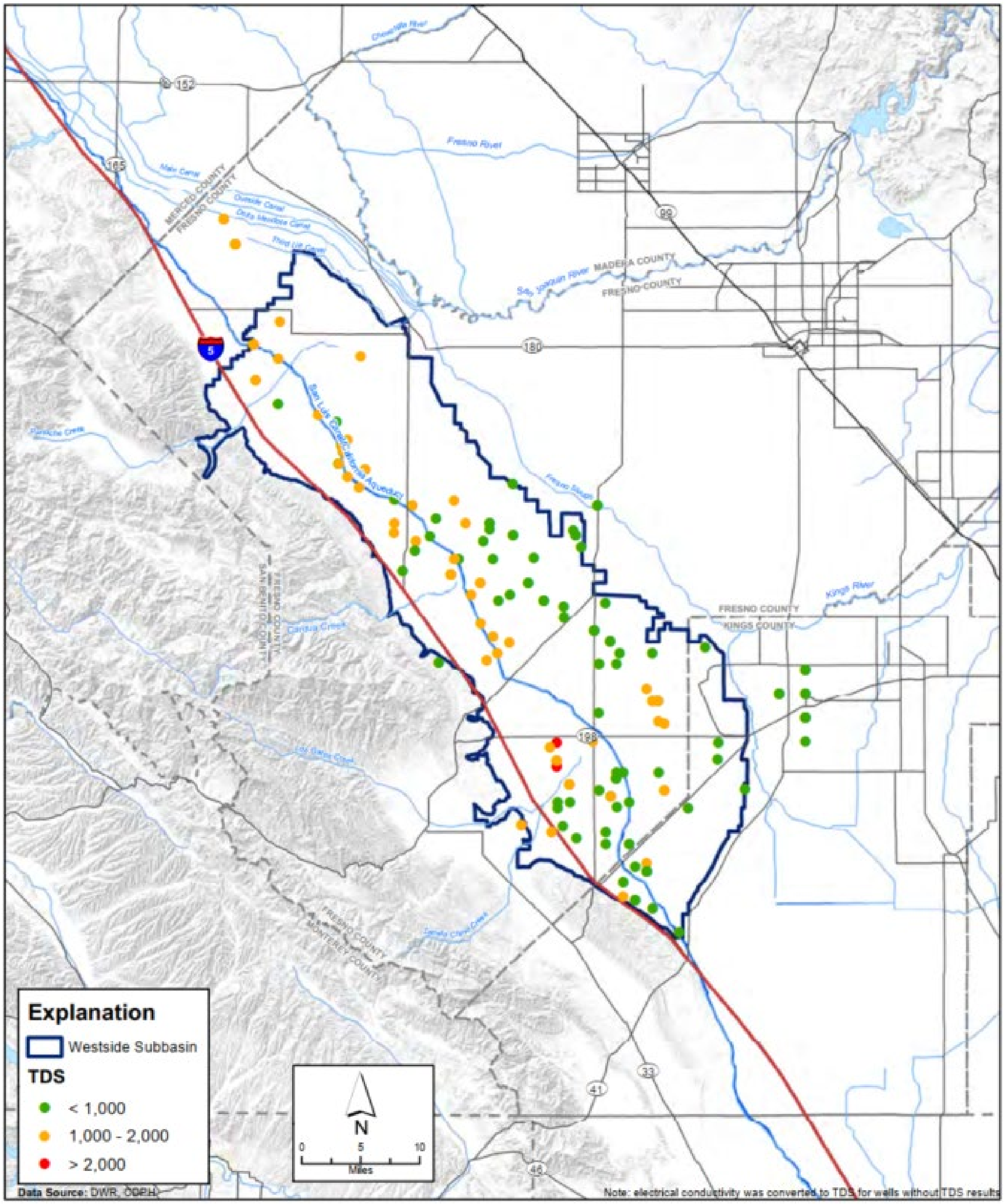
The figures above portray TDS concentration ranges at measured locations across the Upper and Lower Aquifers, respectively, for the period of 2010 through 2015, which was used to inform the recently-approved GSP for the Westside Subbasin. There is less water quality data available in recent years; however, review of available data extending to 1995 suggests an overall slight improvement in TDS concentrations in the Lower Aquifer (WWD GSA and County of Fresno GSA-Westside 2022a). The figures above are also informed by data from different monitoring wells, and the extent of data available for each aquifer varies depending upon the well locations. In general, there is a lack of water quality data for the Upper Aquifer west of the California Aqueduct, whereas most of the water quality data for the Lower Aquifer is concentrated along the California Aqueduct (this portion of the aqueduct is a joint federal/State facility called the San Luis Canal).

Figure 5.13-5 TDS Concentrations, Upper Aquifer



Source: WWD GSA and County of Fresno GSA-Westside 2022a (Figure A-3)

Figure 5.13-6 TDS Concentrations, Lower Aquifer



Source: WWD GSA and County of Fresno GSA-Westside 2022a (Figure A-6)

Sustainable Groundwater Management Act

In 2014, SGMA established a framework for local groundwater management under which the DWR assigns priority levels to groundwater basins based on existing water balance conditions. The Westside Subbasin is designated as Critically Overdrafted. The purpose of SGMA is to bring overdrafted basins into sustainable conditions by 2040, and to maintain sustainable conditions in the future. To accomplish this, groundwater basins are required to be managed by DWR-approved Groundwater Sustainability Agencies (GSAs), which are then required to develop and implement a Groundwater Sustainability Plan (GSP) for each of their respective basins.

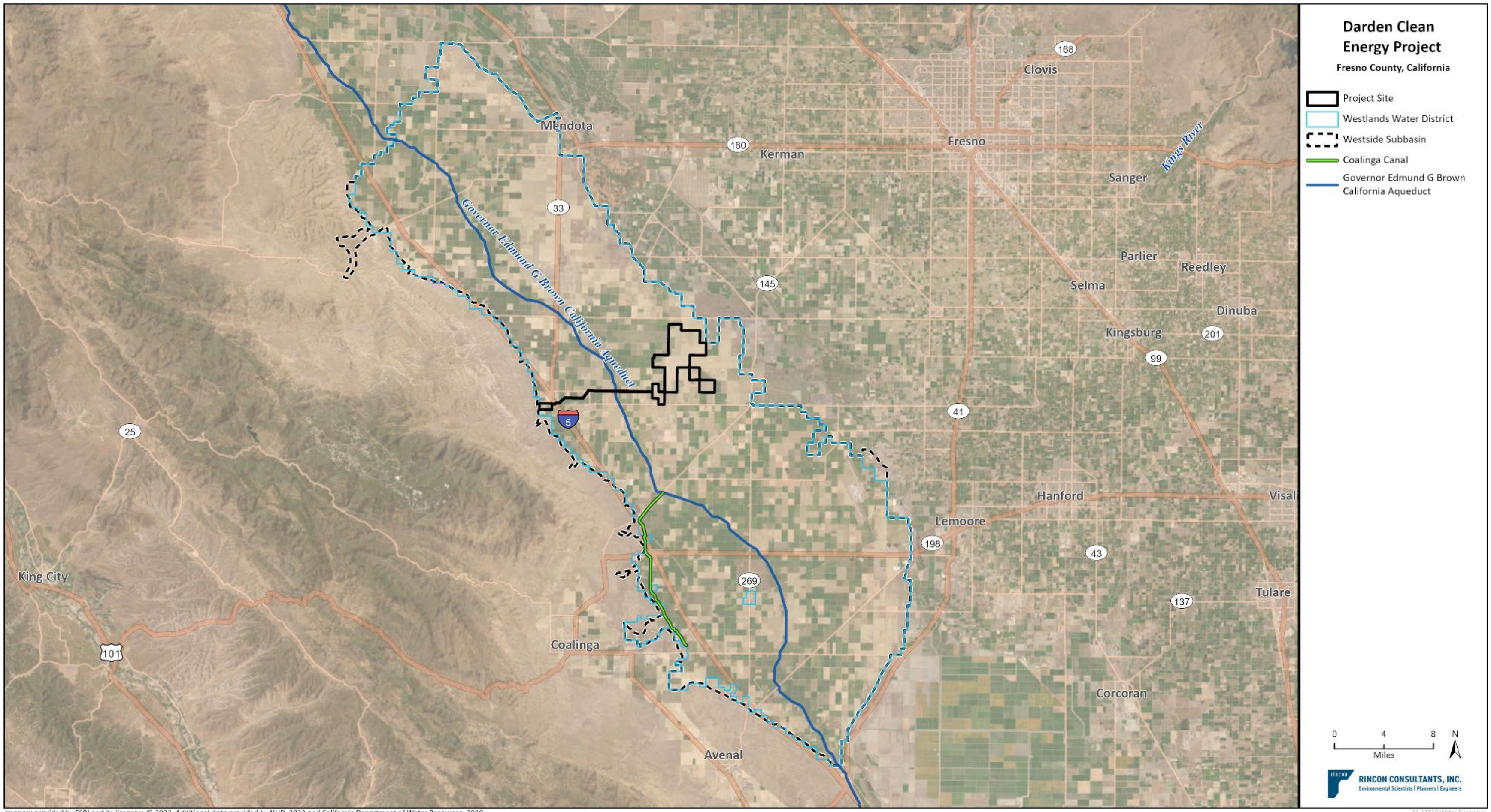
The Westside Subbasin GSP identifies a suite of actions being conducted to reverse overdraft. Among these, agricultural fallowing practices are a key strategy, involving the removal of irrigation from actively farmed parcels, to reduce the amount of groundwater pumped from the Westside Subbasin, thereby encouraging recovery from historical over-pumping of the basin.

Groundwater Sustainability Agencies

The Westside Subbasin is managed jointly by two GSAs – the WWD GSA and the County of Fresno GSA-Westside. The majority of the Westside Subbasin is within WWD's service territory, while there are several small areas along the western and eastern edge of the subbasin that extend past WWD boundaries and fall within the jurisdiction of Fresno and Kings counties. The County of Fresno serves as the GSA for the portions of the Westside Subbasin located outside WWD's boundaries and within Fresno County. The portion of the subbasin that underlies Kings County is within the Naval Air Station Lemoore, which is owned by the federal government and thus, is exempt from the requirements of SGMA (WWD GSA and Fresno County GSA 2022b).

The WWD GSA and the County of Fresno GSA-Westside operate collaboratively through a Memorandum of Understanding (MOU), which allows them to develop one comprehensive GSP for the subbasin. The MOU allows the WWD GSA to implement the GSP in all portions of the Westside Subbasin, including unincorporated county areas. Both the WWD GSA and the County of Fresno GSA-Westside has the authority to implement the GSP through its statutory land use and water management responsibilities pursuant to its constitutional police powers. Figure 5.13-7, below, shows the boundaries of WWD's service area and the boundaries of the Westside Subbasin, showing the boundaries largely coincide, and the Project site is approximately centered within both.

Figure 5.13-7 Westlands Water District



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In addition to WWD and the County's jurisdictions, a portion of the Westside Subbasin also underlies Kings County; however, this the Kings County portion of the subbasin is within the Naval Air Station Lemoore, which is owned by the federal government and therefore exempt from SGMA (WWD GSA and Fresno County GSA 2022b). Accordingly, Kings County is not included as a GSA for the Westside Subbasin, even though a portion of the subbasin is within Kings County.

Groundwater Sustainability Plan

The WWD GSA and the County of Fresno GSA-Westside operate collaboratively through a Memorandum of Understanding (MOU), which allows them to develop one comprehensive GSP for the subbasin. Both the WWD GSA and the County of Fresno GSA-Westside have authority to implement the GSP through their statutory land use and water management responsibilities pursuant to constitutional police powers. The MOU between the GSAs for joint management of the subbasin allows the WWD GSA to implement the GSP in all portions of the Westside Subbasin, including unincorporated county areas. This allowance does not alter the authority of the County of Fresno GSA-Westside over the subject lands; it simply provides authority to the WWD GSA.

The purpose of SGMA is to bring groundwater basins into sustainable conditions by 2040 and to maintain sustainable conditions in the future. This is accomplished through the planning and implementation of basin-specific projects and management actions (PMAs) outlined in the respective GSPs. As required by SGMA, the Westside Subbasin GSP sets forth PMAs which are designed to support the reversal of overdraft conditions. The Westside Subbasin PMAs involve management strategies including:

- Provide access to more reliable surface water supplies to existing water users, to stabilize groundwater reliance through dry years;
- Conduct conjunctive use management of surface and groundwater supplies, including through aquifer storage and recovery (ASR) to store wet weather surplus for later use as needed; and
- Control for water demands through implementation of a water supply allocation system.

The Westside Subbasin GSP was approved by DWR in 2023. Changes or progress made towards PMA implementation is documented in Annual Reports, which are also required by SGMA to be submitted to DWR for review and approval. Table 5.13-3, below, provides an overview of the PMAs for the Westside Subbasin, and the status of implementation in 2021, based upon the 2021 Annual Report for the Westside Subbasin GSP (WWD GSA and Fresno County GSA 2022b).

Table 5.13-3 Westside Subbasin – Projects and Management Actions

PMA	Overview and Status of Implementation
Project No. 1: Surface Water Imports	The primary focus of the Surface Water Imports program is to increase surface water availability and reliability and to reduce the corresponding landowner reliance on groundwater within the Subbasin by fulfilling most of the agricultural, municipal, and industrial water demands within the Subbasin. Surface water deliveries will be obtained through existing CVP contracts and through water transfer and exchange projects. Increasing the supply of surface water will allow surface water to be used in lieu of groundwater leading to increased groundwater storage and levels. The increased delivery of surface water can further conjunctive use strategies. **2021 Status:** ▪ In 2021, no water from WWD's contract entitlement amount for CVP water was available for agricultural water service contractors located south of the Delta. ▪ WWD and its water users were still able to secure 173,000 AF of surface water from the CVP and an additional 44,000 AF of surface water from other non-CVP contract sources for irrigation during the 2021 water year.
Project No. 2: Initial Allocation of Groundwater Extraction	The GSA has prepared a groundwater allocation framework to manage demand by equally distributing the total annual pumping from the Subbasin on the basis of land acreage overlying the Subbasin. The groundwater allocation program includes a "transition period" from 2022 to 2030, in which a uniform annual allocation for agricultural uses is established at 1.3 AFY per acre and then subsequently reduced each year by 0.1 AFY per acre until 2030, at which time the annual allocation will be 0.6 AFY. The groundwater will be distributed based on per-acre land ownership for all qualifying lands, or agricultural lands that have not been retired. Landowners overlying the Subbasin with the ability to make reasonable and beneficial use of groundwater on their lands will be entitled to register for a groundwater allocation based solely on overlying (developed or undeveloped) acreage and irrespective of prior use of groundwater utilization. Municipal and Industrial (M&I) groundwater users will not be regulated as part of the GSP if they are de minimus users, or those pumping two AFY or less for domestic purposes. If groundwater extraction rates exceed 2 AFY, the user(s) will be regulated under the GSP; however, M&I users are not currently subject to allocation management actions. Therefore, all overlying landowners will have equal access to available groundwater subject to the sustainability requirements of the GSP and the avoidance of undesirable results. The allocation will not constitute a determination of common law water rights; rather, the distribution will ensure there are no long-term imbalances in the Subbasin, increase pumping transparency, and provide more flexibility to water users for resources management that provides benefits not traditionally available under common law (e.g., banking of unused water, trading). **2021 Status:** ▪ An aggregate (Upper and Lower Aquifer) allocation of 1.3 AF/acre was anticipated for the initial water year (2022), to be reduced by 0.1 AF per acre until 2030, for an allocation of 0.5 AF/acre, which will be distributed by WWD based on per-acre land ownership for all qualifying lands. ▪ As of September 2021, WWD installed 359 meters, covering about 35 percent of active agricultural wells in the Subbasin.
Project No. 3: Aquifer Storage and Recovery	An aquifer storage and recovery (ASR) program involving the direct injection and subsurface storage of imported surface water into groundwater using agricultural wells has been proposed by the GSA to improve water supply reliability within the Subbasin. Landowners will voluntarily adopt the program in order to have the injected water contribute to the landowner's groundwater allocation. **2021 Status:** ▪ WWD submitted two semi-annual monitoring reports and one annual monitoring report to the SWRCB pursuant to the Agricultural ASR Project Monitoring and

PMA	Overview and Status of Implementation
	Reporting Plan (MRP R5-2020-0809). ▪ WWD pursued ownership and operation of an ASR facility in the former Broadview Water District (Broadview ASR Project) within the Subbasin. ▪ Non-ASR recharge projects consisting of on-farm recharge and percolation ponds through WWD's Groundwater Credit Pilot Program were added to this PMA. ▪ Twenty-five (25) recharge projects have been approved to recharge groundwater with imported surface water. The 25 projects include 15 ASR projects, eight percolation basins, and two sub-lateral/tile drain projects. ▪ Total potential recharge capacity of approved projects is 600 AF per day, which is limited primarily by the availability of water to conduct recharge with.
Project No. 4: Targeted Pumping Reductions	It is possible that the combination of other measures will not be sufficient individually or collectively to avoid significant and unreasonable land subsidence. When combined with cumulative Subbasin pumping, groundwater withdrawals near Checks 16, 17, and 20 of the San Luis Canal/California Aqueduct, may require focused management efforts. Consequently, the GSP proposes to offer or, if necessary to avoid significant and unreasonable land subsidence, to require surface water substitution to reduce groundwater pumping near the SLC. In exchange for the reduction in pumping, the GSA may provide incentives to landowners included in this program. Participating landowners may be required to bear material unmitigated impacts in accepting the substitute surface water. **2021 Status:** ▪ Targeted pumping reductions were not conducted in 2021. ▪ WWD installed 15 survey benchmarks to measure subsidence, funded by Round 3 of Proposition 68 Sustainable Groundwater Planning Grant.
Project No. 5: Percolation Basins	The GSA is proposing engaging in managed aquifer recharge through percolation basins in selected areas of the Subbasin to increase groundwater in storage. These basins would be constructed on GSA-owned land in the southwestern portion of the Westside Subbasin where the Corcoran Clay is not present. The basins would be used to store excess water and recharge the Upper Aquifer and Lower Aquifer. Currently, the GSA is investigating the feasibility of this project at potential sites located in the Subbasin. **2021 Status:** ▪ DWR awarded funding to WWD from the Prop. 68 Sustainable Groundwater Management Grant to implement the Pasajero Groundwater Recharge Project adjacent to the Los Gatos Creek, in the southern area of the Westside Subbasin. ▪ WWD conducted design of the project which will recharge up to 10,800 AFY in a wet hydrological year. Due to the abundance of low permeability materials to depths of up to 40 feet, groundwater recharge at this location requires dry wells to facilitate groundwater recharge.

Source: WWD GSA and Fresno County GSA 2022a, 2022b

Subsidence

Subsidence is a gradual lowering of the ground surface elevation. In the Project area and throughout the Central Valley, subsidence occurs primarily as a result of over-pumping the groundwater, and persistent groundwater overdraft conditions. Figure 5.13-8, below, portrays two primary subsidence bowls that have persisted in the Westside Subbasin. This figure shows the extent of subsidence areas as measured over the 46-year period between 1926 and 1972. While subsidence conditions can decrease and increase depending upon climatic conditions and pumping pressures, when they are present, they tend to be concentrated in and around the northern and southern “bowls” portrayed in the figure below.

Dry conditions beginning in the 2020 Water Year have led to renewed subsidence within most of the Subbasin. Similar pumping patterns to the 2012-2016 drought have emerged leading to a decline in water levels measured at extensometers which approach lows experienced during the 2012-2016 period (WWD GSA and County of Fresno GSA-Westlands 2022a). Subsidence conditions affect water supply availability, as pumping groundwater from a subsidence prone area would exacerbate subsidence conditions, which would be counter to objectives for sustainable management of the subbasin. Areas prone to subsidence are also priority areas for ASR projects.

As described in the Westside Subbasin GSP, the GSAs are currently implementing a subsidence monitoring network throughout the subbasin, in cooperation with other agencies including the USGS, DWR, and USBR. The monitoring network provides robust spatial coverage of subsidence conditions using enhanced monitoring in key locations along the San Luis Canal, where rates of subsidence impact the freeboard and conveyance capacity in the San Luis Canal (WWD GSA and County of Fresno GSA-Westside 2023a (pg. ES-12). Measurements taken through the existing subsidence monitoring network are taken continuously, bi-annually and annually depending on the monitoring agency (WWD GSA and County of Fresno GSA-Westside 2023a (pg. ES-12).

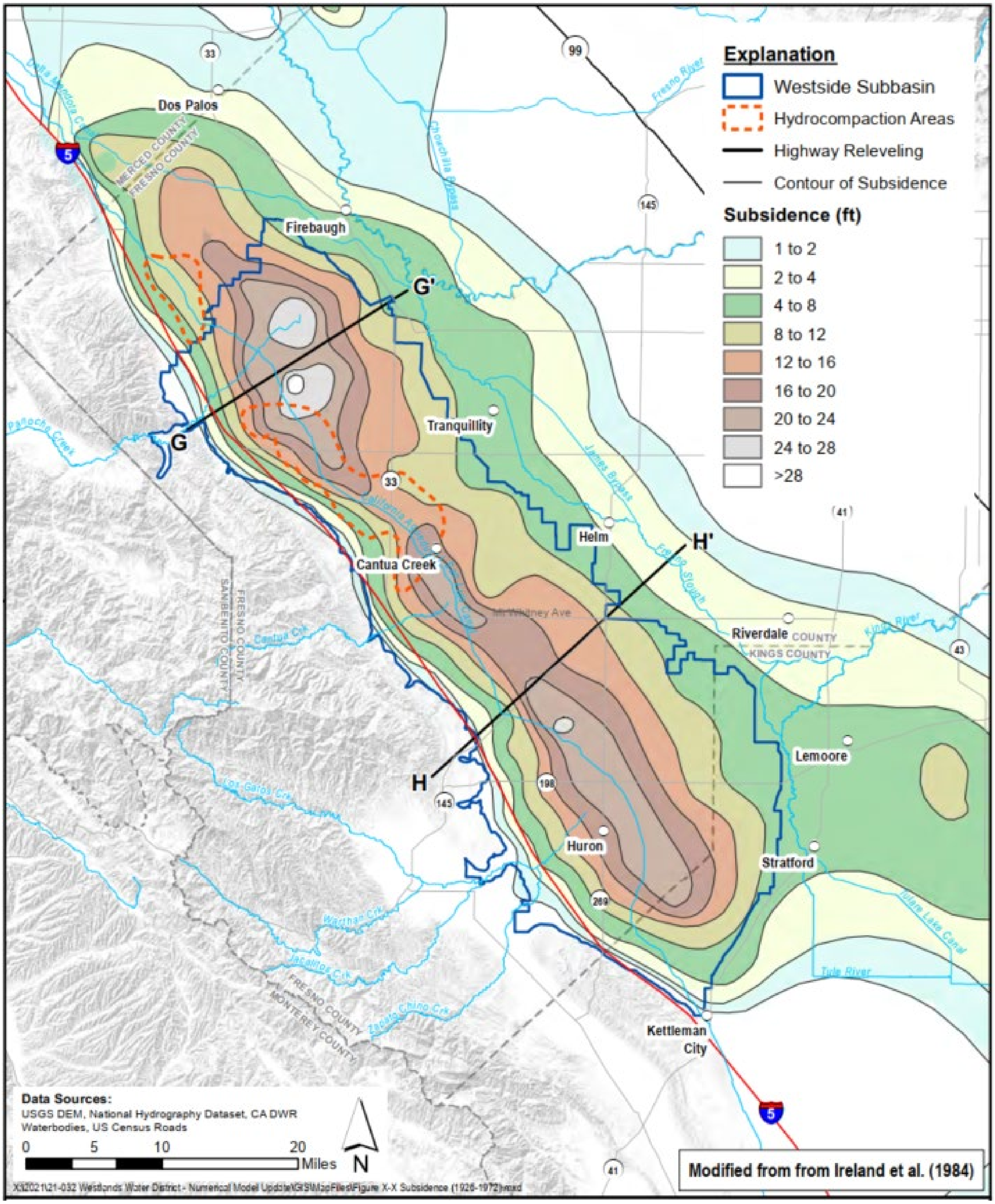
The extent of subsidence and potential efficacy of mitigation would be dependent upon both regional and site-specific information; therefore, the GSAs would continue to collect and analyze data pertinent to subsidence in the Upper Aquifer (WWD GSA and County of Fresno GSA-Westlands 2022a).

Nearby Wells

As required by Appendix B Requirement (B), Figure 5.13-9a through Figure 5.13-9h on the following pages identify existing wells within 0.5 mile of the Project site. Data from the SWRCB and USGS's Groundwater Ambient Monitoring and Assessment (GAMA) Program was used to understand the depth and status of existing groundwater wells in the Project area. The GAMA Program provides comprehensive data on existing wells, including irrigation wells. Of the nearby domestic wells listed in GAMA, mean well completion depths range from 140 to 800 ft. Of the nearby irrigation wells, mean well completion depths range from 260 to 1,260 ft.

As shown in Figure 5.13-3, *Depth to Groundwater,* depth to groundwater is greatest along the foothills to the west of the Project site, and decreases towards the valley floor to the east of the Project site.

Figure 5.13-8 Land Surface Subsidence in the Westside Subbasin (1926 – 1972)



Source: WWD GSA and County of Fresno GSA-Westlands 2022a (Figure 2-56)

Figure 5.13-9a Groundwater Well Locations Overview

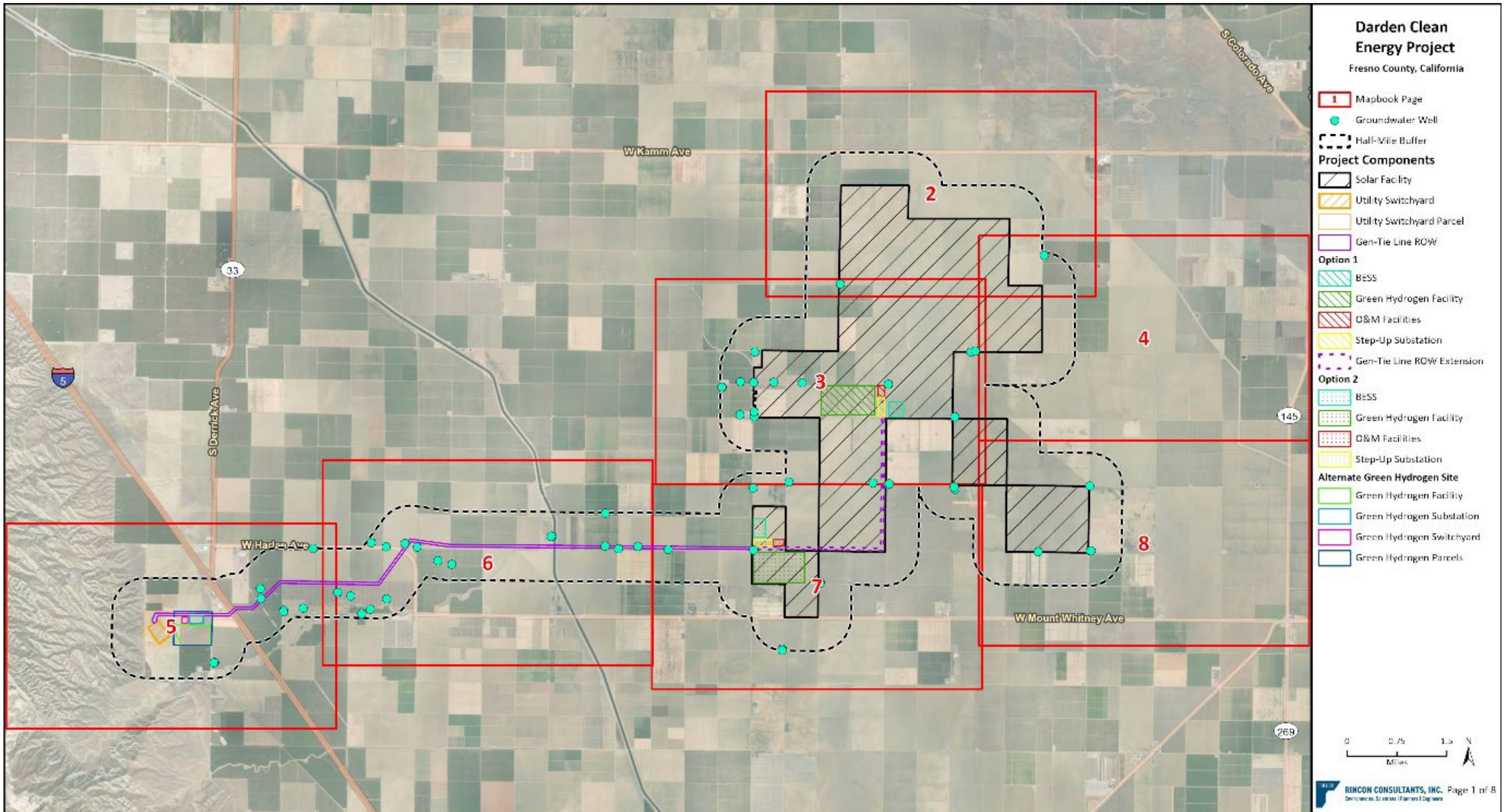


Figure 5.13-9b Groundwater Well Locations (Mapbook Page 2)

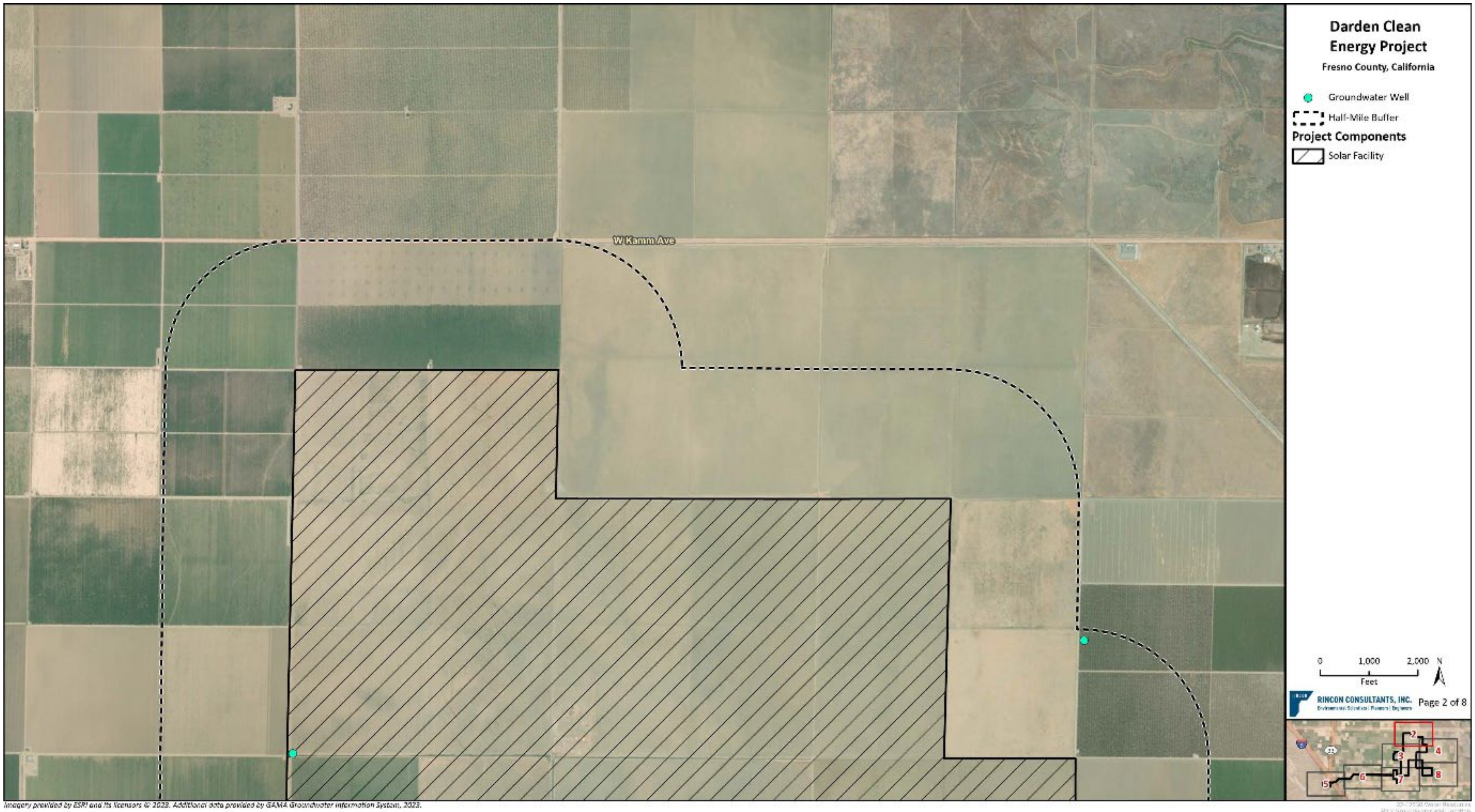


Figure 5.13-9c Groundwater Well Locations (Mapbook Page 3)

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Figure 5.13-9d Groundwater Well Locations (Mapbook Page 4)

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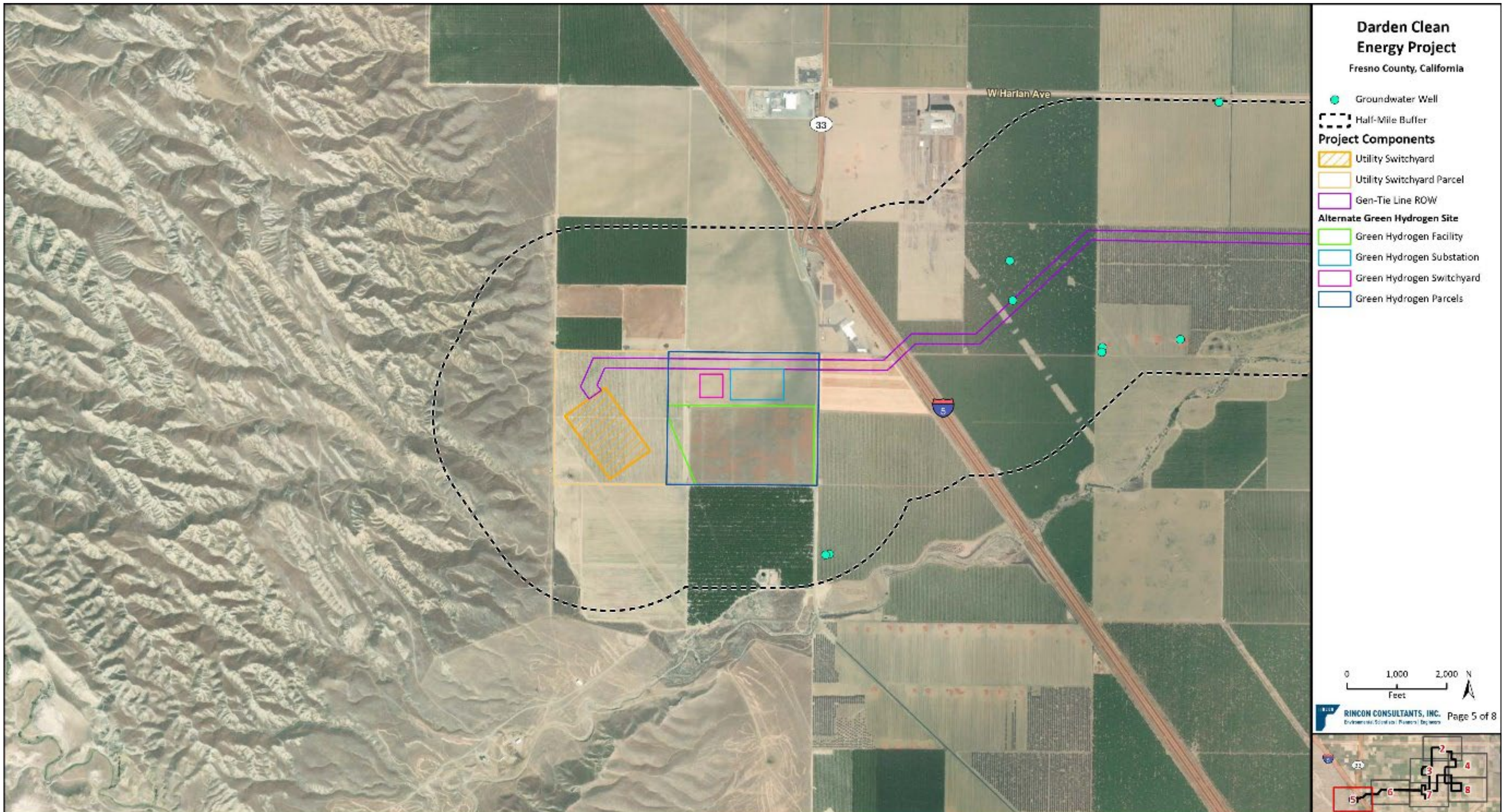
Figure 5.13-9e Groundwater Well Locations (Mapbook Page 5)



Imagery provided by ESRI and its licensors © 2023. Additional data provided by GAMA Groundwater Information System, 2023.

Figure 5.13-9f Groundwater Well Locations (Mapbook Page 6)

Figure 5.13-9g Groundwater Well Locations (Mapbook Page 7)

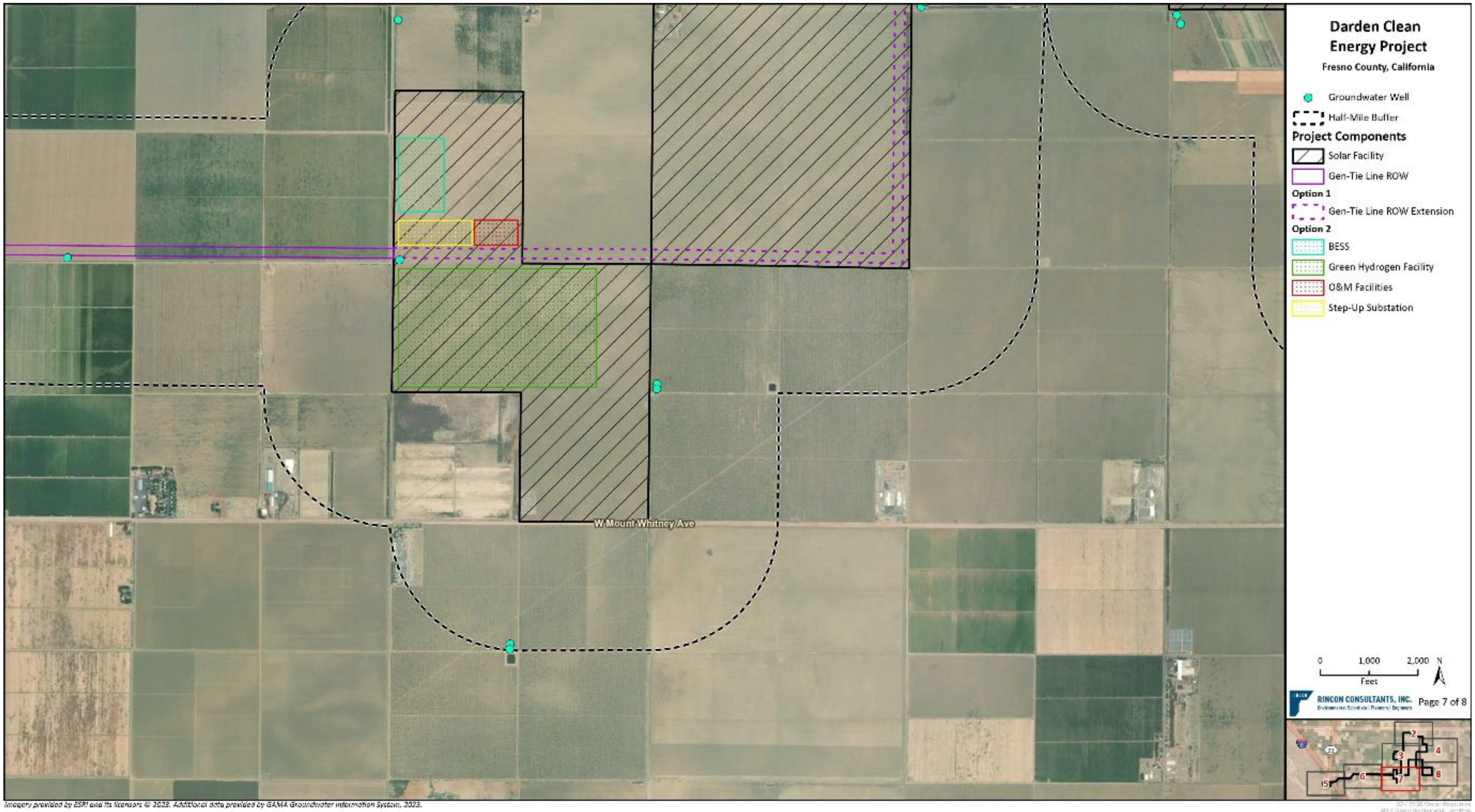


Figure 5.13-9h Groundwater Well Locations (Mapbook Page 8)

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5.13.1.2 Surface Water

The study area for water resources is defined by the watersheds within which the Project site and where facilities are located. This section provides definition of the affected watershed areas and characterizes topography (elevation) and slope, as these factors influence the presence of surface water as well as the rate and extent of stormwater runoff.

Hydrologic Setting

The Project site is located within the Upper Dry Subbasin drainage area within the Tulare Lake hydrologic region. The Tulare Lake hydrologic region covers about 16,800 square miles and includes all of Tulare and Kings counties, and most of Fresno and Kern counties. The hydrologic region is bordered to the east by the Sierra Nevada, to the west by the Coast Ranges, and to the south by the Tehachapi Mountains. Major rivers draining into the Tulare Lake region include the Kings, Kaweah, Tule, and Kern Rivers, which extend from the Sierra Nevada headwaters in eastern Fresno and Tulare counties, to their termination at the former Tulare Lake and Buena Vista Lake beds (DWR 2015).

Project Site

Based upon review of data from the USGS' National Hydrography Dataset (NHD) on surface water flowlines across the U.S., there are no well-defined hydrologic features on the Project site (Intersect Power 2023a). There is also no evidence of intermittent flowlines where surface waters would occur seasonally, or ephemeral flowlines where some amount of flow would be present throughout the year. Surface water on the Project site occurs as stormwater in direct response to precipitation events, and moves as sheet flow across the relatively level Project site. Stormwater is characterized in Section 5.13.1.3, *Stormwater*, and topography and slope of the Project site are discussed under respective headings below.

Watersheds

Watersheds relevant to the Project site were identified based upon review of data from the NHD, which uses national data to delineate stream networks within a defined hierarchy of watersheds. Table 5.13-4, below, provides an overview of the watersheds containing parcels in the Project site, and an estimate of the approximate extent of Project facilities within each watershed.

Table 5.13-4 Watershed NHD Identification Data

Watershed	HUC ID No.	Acres	Portion of Project Site
Helm-Fresno Slough	180300090607	37,755	5% of solar facility area
Fresno Slough	180300090608	52,602	25% of total project site
Mud Dam-Fresno Slough	180300090803	34,848	60% of total project site
Town of Cantua Creek	180300090802	19,062	100% of utility switchyard
Lower Cantua Creek Watershed	180300090605	17,767	10% of gen-tie alignment
Source: Intersect Power 2023a			

The table above indicates the majority of the main development area (approximately 85 percent) is located within the Fresno Slough and Mud-Dam Fresno Slough watersheds. Figure 5.13-10, below, portrays the limits of these watersheds and the Project site.

In the Project area, there is a gradual change in elevation that decreases from the foothills in the southwest towards the northeast. Based on this topography, surface runoff occurs as sheet flow in the direction of decreasing elevation, towards the valley floor. Figure 5.13-11, below, portrays slope in the Project area, indicating the vast majority of the study area has slopes ranging between zero and 2.5 percent, which is a gentle terrain.

Due to the lack of defined surface water features on the Project site, in addition to the relatively level slope of the site, surface water runoff that does not infiltrate the surface moves across the surface as sheet flow that eventually concentrates into low points in the terrain, including man-made agricultural irrigation conveyance ditches; see Section 5.13.1.3, *Stormwater.*

Drainage Areas

Drainage patterns are largely influenced by land cover and soil characteristics, as well as slope and topography. Analysis of drainage across the Project site was conducted by defining 16 separate drainage areas defined based on flow paths and discharge locations; see Figure 5.13-12, below. The Project would include detention basins placed throughout the Project site to control the rate and amount of stormwater runoff associated with each drainage area.

As shown, stormwater runoff generally flows in a northeasterly direction through the Project site, with some variations within individual drainage areas. While there are no defined waterways onsite, several drainage areas overlie flood hazard areas defined by the Federal Emergency Management Agency (FEMA); see Section 5.13.1.4, *Flooding and Inundation*.

Figure 5.13-10 Watersheds in the Project Area

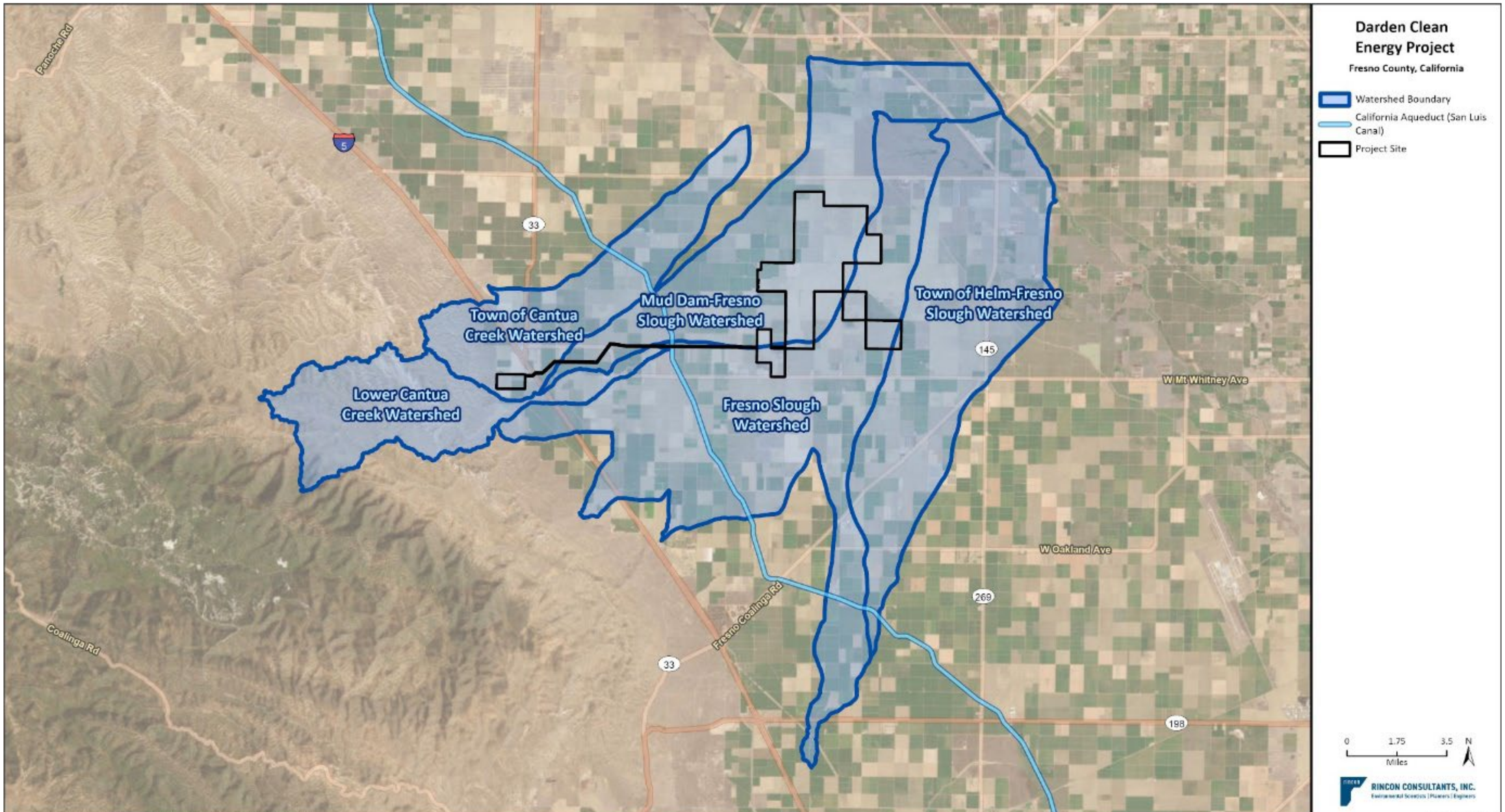

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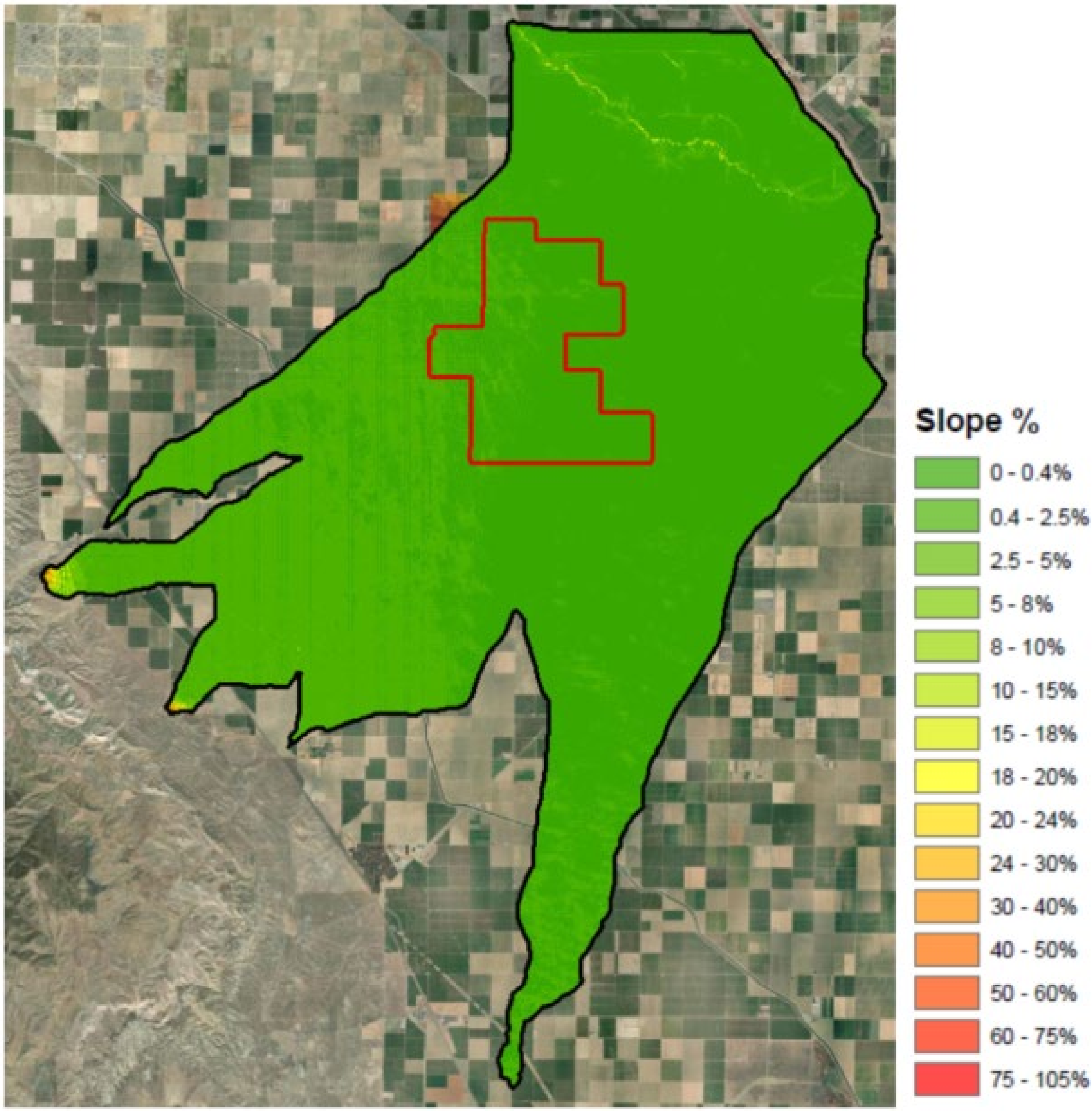
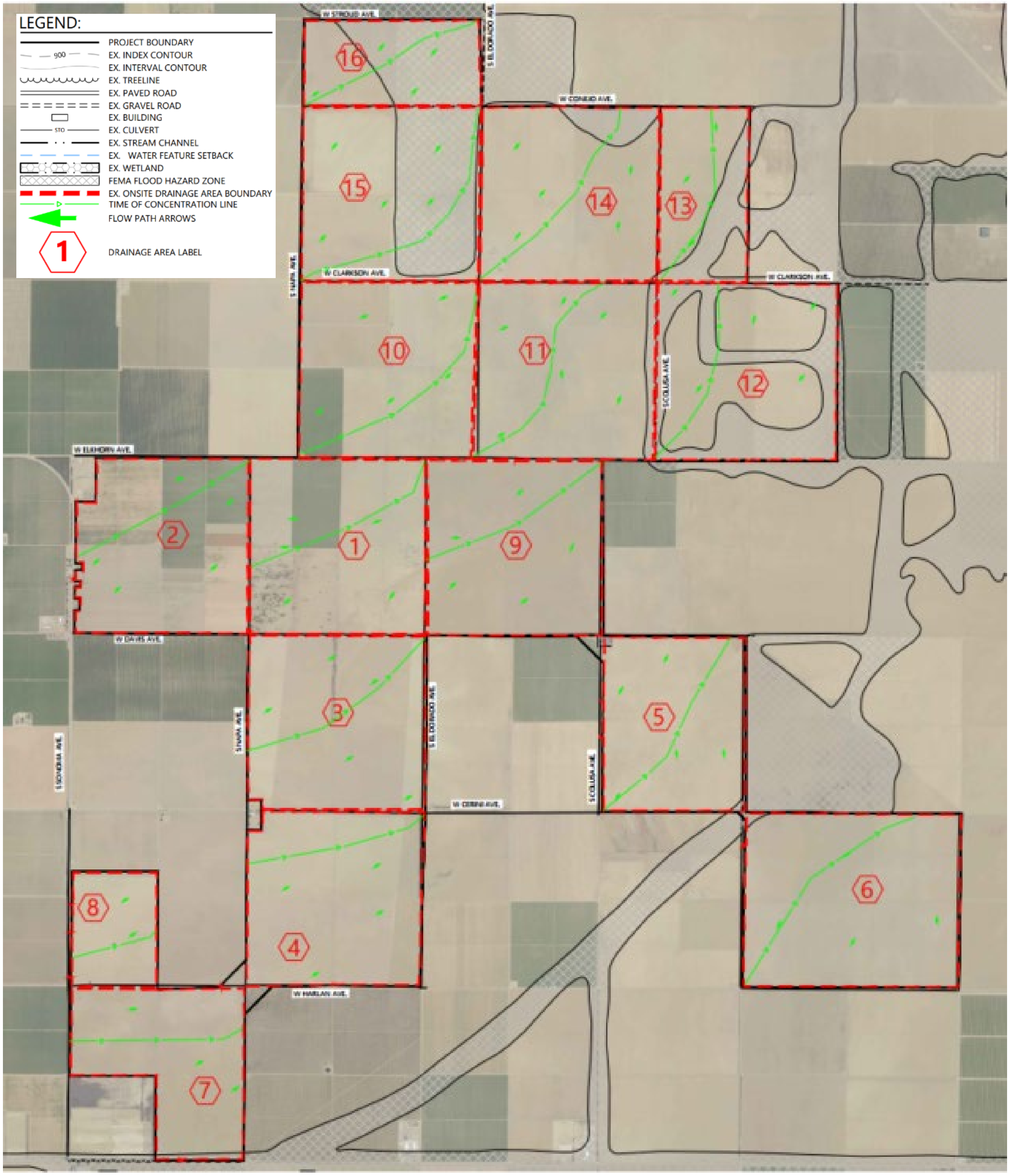
Figure 5.13-11 Slope Model of the Darden Study Area



Source: Intersect Power 2023a

Figure 5.13-12 Existing Site Drainage



Source: IP Darden I, LLC 2023b

Surface Water Quality

The Project site is within the jurisdictional boundaries of the Central Valley RWQCB and is subject to the management direction of the Tulare Lake Basin Plan ("Basin Plan"). The Basin Plan establishes water quality objectives to ensure the reasonable protection of beneficial uses and a program of implementation for achieving water quality objectives. For those waters not attaining water quality standards, the RWQCB establishes total maximum daily loads (TMDLs) for water quality constituents, and a program of implementation to meet each TMDL.

Under the Porter-Cologne Water Quality Control Act and Section 303(d) of the Clean Water Act, each State maintains a "303(d) List of Water Quality Limited Segments" identifying waters that are not attaining water quality standards. TMDLs are required for all waters on the 303(d) list. As discussed above, there are no defined surface water features on the Project site; consequently, there are also no 303(d) listed waters on the Project site. The Project's gen-tie line alignment would traverse the California Aqueduct in a section (Panoche Creek to Grapevine) that is on the 303(d) List for pH. The Project's gen-tie alignment would be adjacent to the north of Cantua Creek, which is on the 303(d) List for Chlorpyrifos, Selenium, and Total DDT. (SWRCB 2023)

5.13.1.3 Stormwater

Stormwater refers to water that occurs on the ground surface in direct response to precipitation events. As required by Appendix B Requirements (D)(i), this environmental setting section addresses the following topics related to stormwater:

- Monthly and/or seasonal precipitation (Appendix B Requirement (D)(i)) – see below under "Climate and Precipitation"
- Infiltration and stormwater runoff (Appendix B Requirement (D)(i)) – see below under "Infiltration and Stormwater Runoff"

Other items from Appendix B include Requirements (D)(ii), (D)(iii), and (D)(iv), which are addressed in Section 5.13.3, *Impact Analysis*, and include the following topics related to stormwater:

- Description of drainage facilities and design criteria including capacity, design storm, and estimated runoff (Appendix B Requirement (D)(ii)) – see below under "Drainage Facilities and Design"
- Assumptions and calculations used to calculate runoff and estimate changes in flow rates between pre- and post-construction (Appendix B Requirement (D)(iii)) – see below under "Drainage Facilities and Design"
- Copy of applicable regional and local requirements regulating the drainage systems and a discussion of how the Project's drainage design complies with these requirements (Appendix B Requirement (D)(iv)) – see below under "Regional and Local Requirements"

The following sections are informed by Project design plans including a *2D Hydraulic Study* (Intersect Power 2023a) and the *Preliminary Drainage Report* (IP Darden I, LLC 2023b), both of which are incorporated by reference herein.

Climate and Precipitation

The Project site is located within the middle-western portion of California's Central Valley, where the climate is hot semi-arid, with long, dry summers, and wet winters. The average temperature is 59 degrees Fahrenheit (°F).

Table 5.13-5, below, provides detailed estimates of rainfall amount in inches over a range of durations between five minutes to 60 days, and accounting for rainfall intensity associated with storm sizes ranging from the one-year storm (anticipated to occur every year) through the 100-year storm (anticipated to occur every 100 years), and up to the 1,000-year storm event.

Table 5.13-5 Precipitation Frequency Estimates (inches) for the Project Site[1]

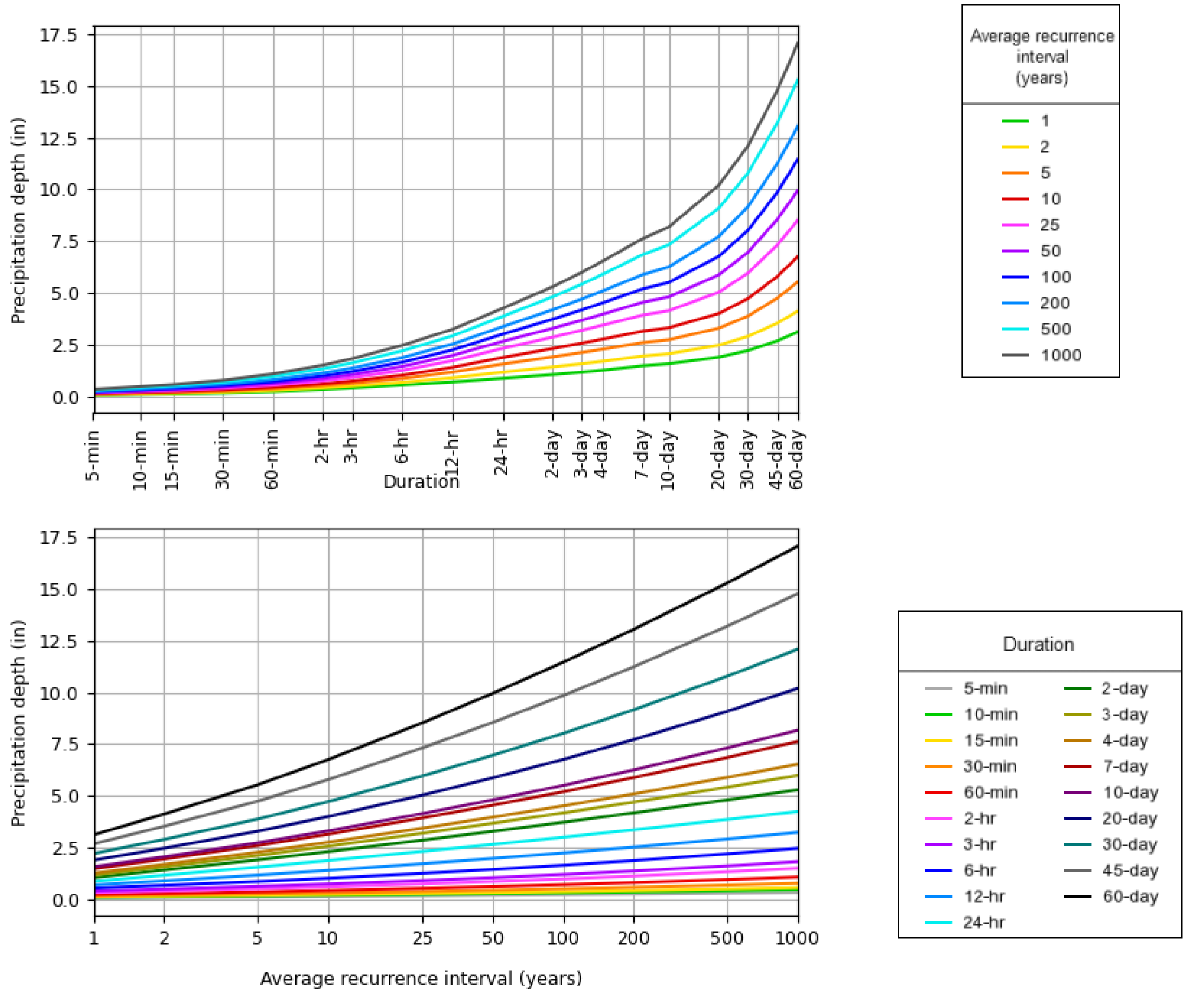
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.068 (0.060-0.077)	0.084 (0.074-0.097)	0.108 (0.095-0.125)	0.129 (0.112-0.150)	0.160 (0.133-0.194)	0.185 (0.150-0.231)	0.213 (0.168-0.273)	0.244 (0.185-0.324)	0.289 (0.208-0.404)	0.326 (0.226-0.476)
10-min	0.097 (0.085-0.111)	0.121 (0.107-0.139)	0.155 (0.137-0.179)	0.185 (0.161-0.215)	0.229 (0.191-0.278)	0.266 (0.216-0.330)	0.305 (0.240-0.392)	0.349 (0.266-0.464)	0.414 (0.299-0.578)	0.468 (0.324-0.683)
15-min	0.117 (0.103-0.134)	0.146 (0.129-0.168)	0.188 (0.165-0.216)	0.224 (0.195-0.260)	0.277 (0.231-0.336)	0.321 (0.261-0.400)	0.369 (0.291-0.474)	0.422 (0.321-0.561)	0.500 (0.361-0.700)	0.566 (0.392-0.825)
30-min	0.160 (0.141-0.183)	0.200 (0.176-0.229)	0.257 (0.226-0.295)	0.306 (0.266-0.355)	0.378 (0.315-0.459)	0.439 (0.356-0.546)	0.504 (0.397-0.647)	0.577 (0.439-0.766)	0.683 (0.493-0.955)	0.773 (0.535-1.13)
60-min	0.223 (0.197-0.256)	0.279 (0.246-0.320)	0.359 (0.315-0.412)	0.427 (0.372-0.496)	0.529 (0.441-0.641)	0.613 (0.498-0.763)	0.705 (0.555-0.904)	0.806 (0.613-1.07)	0.955 (0.690-1.34)	1.08 (0.748-1.58)
2-hr	0.326 (0.288-0.373)	0.401 (0.354-0.460)	0.509 (0.447-0.585)	0.603 (0.524-0.700)	0.742 (0.618-0.899)	0.858 (0.696-1.07)	0.984 (0.775-1.26)	1.12 (0.854-1.49)	1.33 (0.960-1.86)	1.50 (1.04-2.19)
3-hr	0.399 (0.352-0.456)	0.491 (0.433-0.563)	0.622 (0.547-0.715)	0.736 (0.640-0.855)	0.905 (0.754-1.10)	1.04 (0.849-1.30)	1.20 (0.943-1.54)	1.37 (1.04-1.82)	1.61 (1.16-2.26)	1.82 (1.26-2.66)
6-hr	0.541 (0.478-0.618)	0.673 (0.594-0.771)	0.858 (0.754-0.986)	1.02 (0.885-1.18)	1.25 (1.04-1.52)	1.44 (1.17-1.79)	1.65 (1.30-2.11)	1.87 (1.42-2.48)	2.20 (1.59-3.07)	2.46 (1.71-3.60)
12-hr	0.690 (0.610-0.790)	0.893 (0.788-1.02)	1.17 (1.03-1.34)	1.40 (1.21-1.62)	1.72 (1.43-2.08)	1.97 (1.60-2.46)	2.24 (1.76-2.87)	2.52 (1.92-3.35)	2.92 (2.11-4.08)	3.23 (2.24-4.72)
24-hr	0.865 (0.784-0.975)	1.16 (1.05-1.31)	1.55 (1.40-1.76)	1.87 (1.68-2.14)	2.31 (2.00-2.72)	2.65 (2.25-3.19)	3.00 (2.48-3.70)	3.36 (2.71-4.26)	3.86 (2.98-5.09)	4.24 (3.17-5.80)
2-day	1.05 (0.948-1.18)	1.41 (1.28-1.60)	1.90 (1.72-2.15)	2.30 (2.06-2.63)	2.86 (2.47-3.36)	3.28 (2.78-3.95)	3.72 (3.08-4.59)	4.18 (3.36-5.29)	4.80 (3.71-6.34)	5.29 (3.95-7.23)
3-day	1.16 (1.05-1.31)	1.57 (1.42-1.77)	2.12 (1.91-2.39)	2.57 (2.30-2.93)	3.19 (2.76-3.76)	3.67 (3.12-4.42)	4.17 (3.46-5.14)	4.70 (3.78-5.95)	5.42 (4.19-7.15)	5.99 (4.47-8.18)
4-day	1.26 (1.14-1.42)	1.69 (1.53-1.90)	2.27 (2.05-2.57)	2.76 (2.47-3.15)	3.43 (2.97-4.05)	3.96 (3.36-4.77)	4.51 (3.74-5.56)	5.09 (4.10-6.45)	5.89 (4.55-7.78)	6.53 (4.87-8.92)
7-day	1.47 (1.34-1.66)	1.94 (1.76-2.19)	2.60 (2.34-2.94)	3.15 (2.82-3.59)	3.92 (3.40-4.62)	4.54 (3.86-5.47)	5.19 (4.30-6.40)	5.88 (4.74-7.46)	6.85 (5.30-9.05)	7.63 (5.70-10.4)
10-day	1.57 (1.42-1.77)	2.06 (1.86-2.32)	2.73 (2.46-3.09)	3.31 (2.96-3.77)	4.14 (3.58-4.87)	4.80 (4.07-5.77)	5.50 (4.56-6.78)	6.25 (5.03-7.92)	7.32 (5.66-9.66)	8.18 (6.11-11.2)
20-day	1.89 (1.71-2.13)	2.47 (2.23-2.78)	3.29 (2.97-3.72)	4.00 (3.58-4.56)	5.02 (4.35-5.92)	5.86 (4.97-7.06)	6.76 (5.60-8.33)	7.72 (6.22-9.78)	9.08 (7.02-12.0)	10.2 (7.61-13.9)
30-day	2.21 (2.00-2.49)	2.90 (2.62-3.26)	3.87 (3.50-4.38)	4.72 (4.22-5.38)	5.95 (5.16-7.01)	6.96 (5.90-8.37)	8.02 (6.64-9.88)	9.16 (7.38-11.6)	10.8 (8.33-14.2)	12.1 (9.03-16.5)
45-day	2.68 (2.42-3.02)	3.53 (3.20-3.98)	4.74 (4.28-5.36)	5.78 (5.18-6.60)	7.30 (6.33-8.61)	8.54 (7.25-10.3)	9.85 (8.15-12.1)	11.2 (9.05-14.2)	13.2 (10.2-17.4)	14.8 (11.0-20.2)
60-day	3.11 (2.82-3.51)	4.12 (3.72-4.64)	5.53 (4.99-6.26)	6.75 (6.04-7.70)	8.52 (7.38-10.0)	9.95 (8.44-12.0)	11.5 (9.49-14.1)	13.1 (10.5-16.5)	15.3 (11.8-20.2)	17.1 (12.8-23.3)

1. Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) would be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Source: NOAA 2023

The table above indicates that over 24 hours of a one-year storm event, an average of 0.87 inch of rain would fall on the Project site, while over the same period during a 100-year storm event, an average of 3.00 inches of rain would fall on the site. This data was sourced from the National Oceanic and Atmospheric Administration (NOAA) and reflects the Project site based on its latitude (36.471°), longitude (-120.2272°), and elevation (239 feet above mean sea level [amsl]). Graphical presentation of the data shown above are provided below in Figure 5.13-13, below.

Figure 5.13-13 Depth-Duration-Frequency Curves for Precipitation at the Project Site

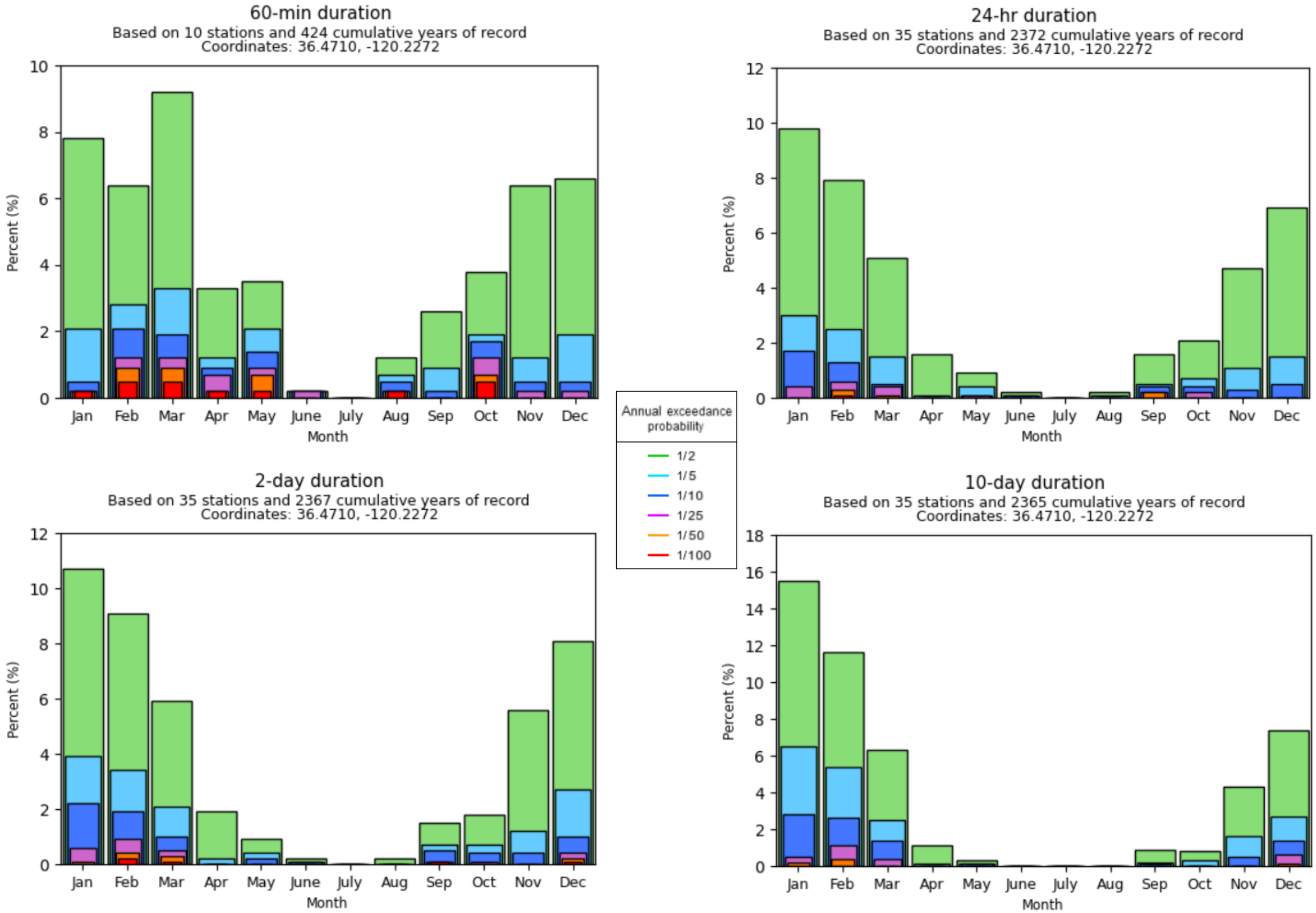


Source: NOAA 2023

The graphs above show the amount of precipitation that occurs is directly correlated with the size of the storm event ("average recurrence interval") and the duration of rainfall. Over 24 hours of a 100-year storm event, an estimated three inches of rain would occur; in comparison, approximately 3.11 inches would occur over 60 days of a one-year storm event (NOAA 2023).

Average annual precipitation in the Project area is about 19 inches total, most of which occurs from November through March. Figure 5.13-14, below, provides a series of seasonality graphs which demonstrate the monthly distribution of rainfall throughout the year. The graphs below also portray how actual precipitation compared to estimated precipitation, for each combination of duration and storm magnitude, and based upon data collected from numerous stations and years of record.

Figure 5.13-14 Seasonal Precipitation – Probability of Exceeding Estimates



Source: NOAA 2023b

The graphs shown above demonstrate how rainfall at the Project site occurs in winter and spring months. Estimates are more likely to be exceeded for shorter-duration storm events. As shown in the graphs, November through March have the highest probability of exceeding estimated precipitation rates, which are typically the months with the highest precipitation. Summer precipitation is unlikely to exceed estimates under all durations, particularly during June through August which are typically the driest months. Rainfall intensity is highest in the areas located nearest to the foothills west of the Project site. The site topography then distributes rainfall uniformly across the watershed in shallow sheet flows.

Infiltration and Stormwater Runoff

Infiltration Rates

Approximately 95 percent of soils on the project site are classified by the USGS as either Group C or Group D soils. These classifications generally have lower rates of infiltration due to higher clay content, resulting in high runoff potential. Group C soils have between 20 and 40 percent clay and Group D soils have greater than 40 percent clay. Generally, rates of infiltration for Group C and D soils are between zero and 0.15 inches per hour. Once the surficial soil layer is saturated by rainfall, continued rainfall does not infiltrate and instead creates runoff that sheet flow across the ground surface. Sheet flow follows the surface topography, moving from higher to lower elevations (southwest to northeast), and eventually ponds in depressional areas as noted above in Section 5.13.1.2, *Surface Water* (Intersect Power 2023a).

As shown in Figure 5.13-14, 1-hour (60-minute) precipitation estimates would range between 0.223 and 1.08 inches, which all exceed the infiltration rate of 0 to 0.15 inches per hour. This indicates that stormwater runoff is likely to occur on the project site during storm events due to the low soil infiltration rates. However, as discussed in Section 5.13.1.2, *Surface Water*, slopes on the project site are below 2.5 percent. Due to the relatively level slope of the site, stormwater runoff that does not infiltrate sheet flows across the project site and eventually concentrates into low points in the terrain, including man-made agricultural irrigation conveyance ditches.

Runoff Coefficient

A runoff coefficient is a dimensionless number representing the ratio of surface water runoff to precipitation. Runoff coefficients are larger for areas with low infiltration and high runoff (ex., pavement and steep gradients), and lower for permeable, well-vegetated areas (ex., forested areas and flat land). The Project site primarily consists of HSG Group D soils with high runoff potential and low infiltration rates, and some areas consisting of Group C soils with moderate runoff potential and low infiltration rates. These characteristics correlate with a high runoff coefficient. The existing Project site consists of row crops on poorly infiltrating soils, with a 0.49 runoff coefficient.

Stormwater Runoff

Stormwater runoff generally flows in a northeasterly direction through the Project site, with some site-specific variations likely due to existing agricultural ditches and conveyance features. Stormwater runoff from the Project site was calculated using the Rational Method (Q=CiA, where "C" is a runoff coefficient, "I" is the rainfall intensity, and "A" is the drainage area). Stormwater runoff on the Project site in the existing condition is estimated to be approximately 1,647 cubic feet per second (cfs) during a 100-year 48-hour storm event, as shown in Table 5.13-6.

Table 5.13-6 Projected Site Runoff Rate per Drainage Area in Existing Conditions (cfs)

Project Drainage Basin ID#	100-year 48-hour Runoff (cfs)
1	137.0
2	135.2
3	127.4
4	133.9
5	74.8
6	105.2
7	110.6
8	61.8
9	129.7
10	114.8
11	92.86
12	103.2
13	49.5
14	90.3
15	121.3
16	59.2
Total	1,646.7

Source: IP Darden I, LLC 2023b

5.13.1.4 Flooding and Inundation

Inundation Areas

For the purposes of this analysis, an "inundation area" refers to the area of land that would be inundated by water in the event of a tsunami, seiche, or dam failure.

- **Tsunami.** The Project site is not located near the ocean, and is separated from the coast by geologic formations of the San Benito Mountains. The Project site is not located within the inundation area for a tsunami.
- **Seiche.** The Project site is not located near an enclosed body of water that could result in a seiche, or the movement of water in response to a seismic event that could result in water being released and inundating downstream areas. The Project site is not located within the inundation area for a seiche.
- **Dam Failure.** The Project site is not located downstream or within the inundation area for any dam identified as having potential for failure with an associated inundation area (DSOD 2023). The Project is not subject to inundation due to the failure of a dam or levee.

The Project site is not located within the inundation area of any tsunami, seiche, or dam or levee failure. Therefore, flooding risks on the Project site are characterized by the FEMA-designated Flood Hazard Areas described below.

Flood Hazard Areas

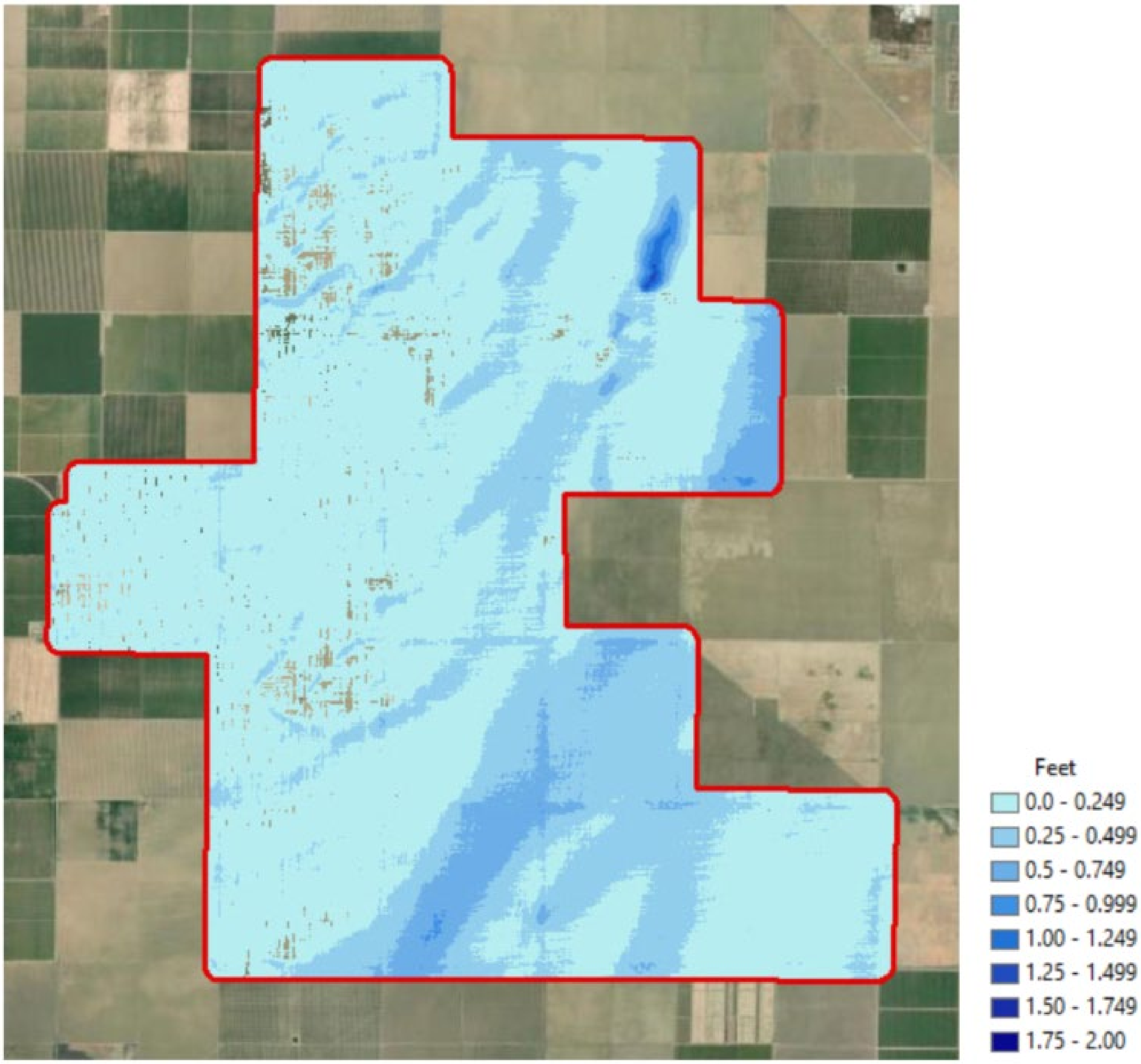
Figure 5.13-15, below, portrays the maximum depth of floodwater on the Project site, based on rainfall intensity under a 100-year storm event (2.99 inches over 24 hours) (Intersect Power 2023a).

The maximum floodplain depth refers to the depth of water moving across the Project site during a modeled 24-hour period of the 100-year storm event. As shown below, on the Project site the maximum depth is less than 0.5 feet across the vast majority of the site, with approximately one third of the Project site characterized by maximum floodplain depth of less than 0.25 feet.

As discussed in Section 5.13.1.3, *Stormwater*, under "Rainfall Intensity Coefficient," rainfall intensity is highest in Drainage Areas 8 (0.63), 7 (0.49), 2 (0.46), 1 (0.44), and 4 (0.44), which are located nearest to the foothills west of the Project site (see Figure 5.13-12). The site topography then distributes rainfall uniformly across the watershed in shallow sheet flows. The maximum depth of the floodplain (where no pooling occurs) was modeled as being up to 0.70 feet, although most flood depths were less than 0.5 feet (Intersect Power 2023a).

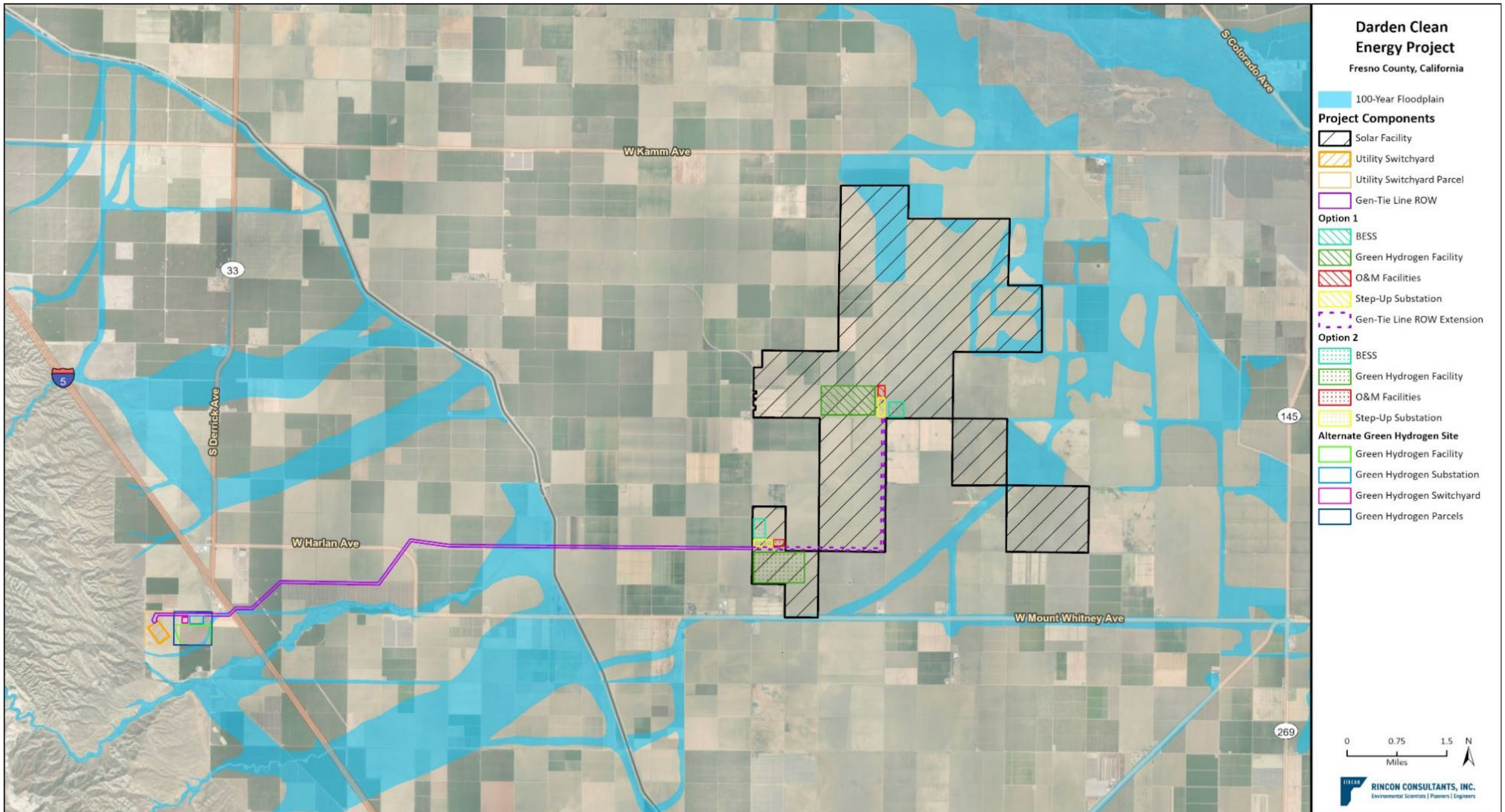
Figure 5.13-16, below, provides an overview of FEMA-designated flood hazard areas across the Project site. FEMA-designated flood hazard areas represent those areas that would be inundated by a storm of the magnitude that occurs once every 100 years, or has a one percent chance of occurring during any given year ("100-year storm"). This figure shows that portions of the northern and northeastern Project site are within FEMA-designated flood hazard areas associated with existing drainage channels and depressions in the ground surface where surface water collects when precipitation and runoff occur. These flood hazard areas are primarily as "Zone A," which represents areas that comprise the 100-year floodplain but have not been subject to detailed analyses such as flooding depths or base flood elevations (Intersect Power 2023a).

Figure 5.13-15 Maximum Floodplain Depth



Source: Intersect Power 2023a

Figure 5.13-16 FEMA-Designated Flood Hazard Areas



Imagery provided by ESRI and its licensors © 2023. Additional data provided by FEMA, 2021.

5.13.1.5 Wastewater

During Project construction, wastewater production would be limited to temporary toilet and sanitary facilities, which would be serviced by a third-party contractor; no wastewater would be discharged within or to the Project site. During Project operation, wastewater production would be associated with permanent toilet and sanitary facilities, brine from water quality treatment and reverse osmosis and electrodeionization (RO/EDI), and liquid discharges from electrolyzer operation, as summarized below.

- Sanitary facilities would either consist of portable sinks and toilets that would be regularly emptied by a permitted provider, or permanent facilities with an Onsite Wastewater Treatment System (OWTS), subject to oversight and approval by the County of Fresno Public Works and Planning Department.
- Brine from water quality treatment may be placed in on-site settling ponds to separate salts from liquid; the solids (salts) would be transported off-site for disposal at an appropriate facility permitted to receive such materials. It is estimated the Project would generate approximately 240 AFY from water quality treatment processes.
- Electrolyzer processes would generate liquid discharges from electrolysis would be treated and reused as electrolyzer feedstock to the maximum extent feasible; this may include sending the liquid discharge through the Project’s on-site water treatment plant (WTP) and RO system for further treatment. Liquid discharges may also be used in the electrolyzer cooling system.

No wastewater generated through the Project construction or operation would be disposed of through direct discharge to open waterbodies.

5.13.1.6 Water Supply

This section characterizes the environmental setting for water supply, under subheadings for each topic required in CEC Appendix B Requirement (C), including water sources, water demands, wastewater discharge, water purveyors, facilities and infrastructure, and water balance.

Water Sources

Two separate and complimentary water supply sources have been identified for the Project, including the following which are discussed further under respective headings below:

- **Land Purchase with Water Rights.** Water procured from the purchase of land with groundwater rights (allocations) would be used to support solar facility operations and M&I uses. Use of groundwater in the allocated amounts would not result in net drawdown to local groundwater, as the allocation ratio was determined through an effort to manage local groundwater sustainably.
- **Surface Water Surplus and Storage.** Water procured as surplus surface flows from WWD would be used for construction of the Project and operation of the Project electrolyzer. The surplus water would be stored via groundwater banking. No net drawdown to local groundwater would occur because only the amount of water contributed to banking would be used for the Project.

Land Purchase with Water Rights

Land with existing water rights would be purchased for inclusion in the Project site, and the water rights would be repurposed to provide water supply for the Project. Specifically, M&I groundwater pumping rights would be conferred to the Project companies through the transfer of land from WWD to the Project companies. Up to 9,116 acres would be acquired for the Project; however, to provide a conservative analysis of water supply availability, it is assumed that 9,000 acres of land would be transferred, with associated groundwater allocations of 56 AFY. Over a planning horizon of 20 years, a total of up to 1,120 AF of groundwater would be produced from onsite wells. This amount is sufficient to meet the Project's demands for M&I uses and operation of the PV development area, which amount to approximately 39 AFY.

Based on the terms of a 2015 settlement agreement between the U.S. Department of Justice (USDOJ) and WWD, land within WWD's service area has associated groundwater allocations in the amount of 2 AFY for every 320 acres developed for solar energy. The Option Agreement between WWD and the Applicant for the transfer of ownership of Project parcels to Project companies also refers to the settlement agreement allocations for solar development. The terms of the Option Agreement is confidential and therefore not provided with this document.

As the primary GSA for the Westside Subbasin, WWD's groundwater allocations (as specified in the confidential Option Agreement with the Applicant) are e consistent with the objectives of SGMA and the Westside Subbasin GSP, specifically to achieve overdraft reversal and restoration of sustainable conditions in the groundwater basin.

Surface Water Surplus and Storage

Water for the Project would also be secured through purchase of Supplemental Water and/or Turn Back Pool surplus water through WWD and purchases directly from private landowners of excess allocations. Purchase of this wet weather surplus flow would occur based on water year 2022/2023 excess supply and put into storage in the Westside Subbasin aquifer for future use by the Project. Water banking credits would be generated through storage and WWD authorization, and the water would be extracted using onsite groundwater production wells (less leave-behind quantities) in future years.

During the 2022/2023 water year, multiple atmospheric rivers brought high amounts of precipitation to California, resulting in full allocation of CVP water contracts, increased availability of Supplemental Water, and increased efforts to bank surface water in the ground for future use. In October 2023, WWD announced its remaining supply of Supplemental Water totaled approximately 13,000 AF (WWD 2023). WWD is also operating a Water Turn Back Pool for up to 30,000 AF to use for groundwater recharge activities. A Turn Back Pool means that agricultural users do not need their full allocations in this water year and that the "turned back" water is available for purchase and banking. In total, as of October 2023, WWD has access to a calculated 43,000 AF of water from Supplemental Water and the Turn Back Pool, which may be acquired for the Project.

Water Demands

Construction

Water demand for Project construction would primarily be related to dust suppression. Concrete would be manufactured off-site and transported to the site via truck, which would not require an on-site water supply. Temporary sanitary facilities would be provided during construction and would not require an on-site water supply.

Construction would occur over 18 to 36 months and water demands have been calculated for the shortest and longest duration construction periods. Construction water demands would total approximately 1,100 AF over an 18-month construction period, or 1,210 AF over a 36-month construction period. The water use during construction would increase slightly as the construction period increases in duration. Temporary sanitary facilities would be provided during construction and would not require an on-site water supply.

Operation

Water demand during operation of the Project would be related to the following: washing solar panels to maintain efficiency; supplying the electrolyzer with water to produce hydrogen via electrolysis, also referred to as “feedstock” water; supplying sanitary facilities in the O&M building; watering sheep used for vegetation management; and initial establishment of nest trees in accordance with the Swainson’s Hawk Conservation Strategy (Appendix V).

As noted, water quality treatment is required for feedstock water; this is because the process of electrolysis requires very high-quality feedstock water. The Project would include an on-site site RO/EDI system for water quality treatment. The RO/EDI system would concentrate dissolved solids existing in the raw water feedstock, while extracting pure water from the feedstock. The waste stream produced by this process is a brine that is higher in total dissolved solids (TDS) than the raw water feedstock, and would need to be disposed of. Several options for brine disposal are currently being considered, including disposal via deep injection well, disposal by discharge to land, incorporating a zero-liquid discharge system that would produce solid waste for disposal, among others. Table 5.13-7, below, provides an overview of operational water requirements for the Project.

Table 5.13-7 Operational Water Demands

Water Use	Annual Operational Demand
PV Panel Washing, and Vegetation Management	25 AFY
Solar Facility O&M Building and initial Landscaping Establishment	10 AFY
Alternate Green Hydrogen Facility O&M Building	4 AFY
Electrolyzer Feedstock Water	1,000 AFY
Total	**1,039 AFY**

Summary of Demands

Table 5.13-8, below, presents the Project’s water demands, summarized by type. This table shows total water demand would be up to 21,990 AF for the combined construction and operational water demands over a future projection of 20 years. The operational lifetime of the Project may extend for up to 35 years; however, for the purposes of this analysis, a planning horizon of 20 years is used to assess demand and supply availability. This planning horizon is consistent with the 20-year planning horizon required of a Water Supply Assessment (WSA) under California Water Code and Senate Bill 610, as well as the 20-year planning horizon required of an Urban Water Management Plan (UWMP) under the Urban Water Management Planning Act.

Table 5.13-8 Summary of Water Demands

Demand Type	Water Demand (per year)	Water Demand (total)
Construction		
18 months (1.5 years)	733 AFY	1,100 AF
36 months (3 years)	403 AFY	1,210 AF
Operation		
PV solar and M&I, 20 years	39 AFY	780 AF
Electrolyzer, 20 years	1,000 AFY	20,000 AF
Total Construction + Operation[1]		
Total water demand (18-month construction)		21,880 AF
Total water demand (36-month construction)		21,990 AF

1. The Project's total water demand is provided as a range to account for construction duration ranging from 18 to 36 months. To provide a conservative analysis, the combined construction and operational water demand is assessed as 21,990 AF, accounting for the maximum construction duration of 36 months.

Wastewater Discharge

Section 5.13.1.5, *Wastewater*, provides information regarding wastewater generation and disposal.

Facilities and Infrastructure

Design of the Project is ongoing, and the specific facilities to be used in water conveyance, water treatment, and wastewater discharge have not yet been finalized. However, based upon the two water supply sources identified for the Project, as discussed above under "Water Sources," facilities and infrastructure that could be required are presented in Table 5.13-9, below.

Table 5.13-9 Water Facilities and Infrastructure

Facility Type	Overview
Water Conveyance	Pipelines would be required to convey water from its source location or stored location to treatment and use locations within the Project site. Existing pipelines would be used as available; new pipelines are also anticipated to be required.
Production Wells	Groundwater production wells screened to the desired depth would be required to produce groundwater from Project parcels with attached groundwater allocations, as well as to retrieve surplus surface water stored through groundwater banking.
Injection Wells	Groundwater injection wells would be needed to store surplus surface water via groundwater banking for use as needed.
Monitoring Wells	Groundwater monitoring wells are recommended throughout Project implementation to identify any elevation or storage changes in the local basin and facilitate Project adjustments to ensure Project activities do not cause or exacerbate overdraft.
Water Supply Storage	To ensure the electrolyzer would have a constant supply of ultra-pure water, on-site water storage is recommended.
Water Quality Treatment	Water quality treatment would be needed to reduce salts in most water sources; the WTP and RO system currently included in the Project design would serve this purpose.
Wastewater	Wastewater in the form of high-TDS brine would be produced from water quality treatment and electrolysis; collection and conveyance infrastructure for treatment and reuse would be required. Depending upon the disposal method, evaporation ponds may also be required.

Water Purveyors

Appendix B Requirement (C), item (v) requests a letter of intent or will-serve for water supplies intended for industrial uses and provided by public or private water purveyors, with the letter of intent indicating the purveyor's willingness to serve the project, the availability of adequate supplies, and any conditions or restrictions.

The majority of the Project's water demands are associated with the production of green hydrogen, which is considered an industrial use; these demands would be met using surplus surface water flows obtained from WWD and private landowners and stored through groundwater banking for use as needed. Coordination with WWD regarding water supply for the Project is underway.

Water Balance

Water Supply

The water supply scenario for the Project would consist of two different and complementary sources, including groundwater allocations from land ownership, and surplus surface water flows obtained from WWD and private landowners and stored via groundwater banking for use as needed under the Project site. The supply sources were designed to result in no net depletion of groundwater and to maximize conservation and reuse. Therefore, it is anticipated that water supply conditions for the Project would be balanced.

Wastewater

Please see Section 5.13.1.5, *Wastewater*, for the requested information regarding wastewater generation and disposal. During Project operation, wastewater would be associated with permanent toilet and sanitary facilities, brine from water quality treatment and RO/EDI, and liquid discharges from electrolyzer operation. Management of the Project's wastewater streams would not result in direct discharge to open waterbodies.

Stormwater

The Project does not include use of an existing stormwater drainage system within the site. As discussed in Section 5.13.1.3, *Stormwater*, the Project includes a series of detention basins that would be installed throughout the Project site. These basins would slow the rate of stormwater runoff leaving the Project site, resulting in improved stormwater drainage conditions. The direction of stormwater flow would follow the topography, exiting the Project site to the north, where stormwater flows enter the existing agricultural drainage system. Due to the Project reducing the rate and amount of stormwater leaving the Project site, there is sufficient capacity in the existing drainage system to convey flows from the Project site.

5.13.2 Regulatory Setting

A review of existing relevant LORS was conducted to understand the regulatory context for water resources, hydrology, and water quality relevant to the Project. This included review of applicable federal, state, and local policies and regulations including California Environmental Quality Act (CEQA), CWC, SGMA, Fresno County's General Plan and Code of Ordinances, and other applicable LORS which are detailed in Section 5.13.5, *Laws, Ordinances, Regulations, and Standards*.

5.13.3 Impact Analysis

The following subsections discuss the potential direct and indirect impacts related to water resources from construction and operation (including maintenance) of the Project.

5.13.3.1 Methodology

To identify and assess potential impacts related to water resources, Rincon Consultants, Inc. considered the activities of the Project against existing conditions, as characterized in Section 5.13.1, *Environmental Setting*, and based upon review of publicly available information including maps, online databases, articles, reports, and published research papers (see Section 5.13.7). Section 5.13.3.2, *Impact Evaluation Criteria,* presents detailed impact analyses, with each impact characterized for construction and operational periods, under each of the following key Project components: Solar Facility, Step-Up Substation, and Gen-Tie; BESS; Green Hydrogen; and Utility Switchyard.

5.13.3.2 Impact Evaluation Criteria

The potential for impacts related to water resources and their uses were evaluated using the criteria described in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Sections 15000-15387, Title 14, California Code of Regulations, Chapter 3). A project would have a significant environmental impact in terms of water resources if it would meet any of the following criteria:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
  - Result in substantial erosion or siltation on- or off-site;
  - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
  - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; and/or
  - Impede or redirect flood flows;
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; and/or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impact WAT-1

Threshold:	Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
Threshold:	Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

Less than Significant Impact. Construction of the solar facility, Options 1 and 2 substation, and gen-tie components would include preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for compliance with the National Pollutant Discharge Elimination System (NPDES) program under Section 402 of the federal Clean Water Act. For the Project, this would involve compliance with the SWRCB's Construction General Permit (Order 2022-0057-DWQ) through implementation of the project-specific SWPPP with best management practices (BMPs) to avoid or minimize soil erosion or sedimentation. The SWPPP would include BMPs to control the discharge of pollutants including sediment, into local surface water drainages, and would specify the stormwater monitoring and construction BMPs required to protect the quality of surface water and groundwater in the Project area. Construction BMPs may include but would not be limited to erosion and sediment control BMPs to minimize erosion and retain sediment on site, and "good housekeeping" BMPs to prevent spills, leaks, and off-site discharge of construction-related chemicals, debris, and waste.

Construction activities would also involve the handling, use, and storage of limited quantities of hazardous materials, which would be limited to gasoline, diesel fuel, propane, motor oil, coolant, and hydraulic fluid. As discussed in Section 5.9, *Hazards Materials Handling*, a Risk Management Plan (RMP) would be implemented during Project construction to specify safe handling and emergency response procedures, should an unintended lead or release of hazardous materials occur. Implementation of safety and response measures during Project construction would minimize the potential for hazardous materials to be released into the environment such that water resources could be affected.

Construction activities would include excavation that could result in encountering perched or shallow groundwater, depending on site-specific conditions at the location of excavation. For instance, the transmission structures that would be installed within the gen-tie corridor would be placed within holes excavated to up to 40 feet. As discussed in Section 5.13.1.1, *Groundwater*, under "Aquifer System Overview," the first approximately 100 feet below the ground surface is considered part of the Shallow Zone, which is not hydrologically connected to the underlying aquifer system, and which is recharged through infiltration and inflow of irrigation water. If water is encountered during excavation, dewatering may be required.

The water removed from the work area during dewatering activities may be discharged to the ground surface, or stored and reused on-site, such as for dust suppression. If the removed water is discharged to land, compliance with the Construction General Permit would require testing and treatment to ensure that the discharge meet or exceed the effluent limitations specified in the permit. Dischargers seeking permit coverage for dewatering activities under the SWRCB General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water RWQCB

Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085 must file a Notice of Intent with the Central Valley RWQCB prior to beginning the discharge of dewatered water to the ground.

Construction on the Project site would not contribute to the degradation of water quality within a 303(d) listed waterbody, as there are no 303(d) listed waterbodies on the Project site. The Project's gen-tie line alignment would be constructed adjacent to Cantua Creek, which is on the 303(d) List for Chlorpyrifos, Selenium, and Total DDT and would traverse the California Aqueduct in a section (Panoche Creek to Grapevine) that is on the 303(d) List for pH. However, construction of the gen-tie line would also be subject to the requirements of the Construction General Permit. The SWPPP would include BMPs that would be implemented during construction to reduce pollutants in stormwater runoff from the construction site to ensure that project construction does not contribute to the degradation of these impaired water bodies does not occur.

Construction activities would not include the discharge of wastewater, as any wastewater generated during the construction period would be contained within portable toilet facilities and disposed of by a licensed contractor. Potential impacts would be less than significant.

Operation

Less than Significant Impact. The Construction General Permit described above would apply to operations through "Post-Construction Requirements" involving the implementation of BMPs and low impact development (LID) features to provide post-Project runoff conditions that are comparable or improved compared to existing conditions. Project design features would include a series of detention basin throughout the site to reduce stormwater and pollutant discharge from the Project site. Compliance with the requirements of the Construction General Permit and construction of operational BMPs and low impact development features would control stormwater runoff and reduce pollutants to prevent degradation of water quality.

Operation of the solar facility, Options 1 and 2 step-up substation, and gen-tie corridor components would not involve the routine transportation of hazardous materials to and from the Project site. As described in Section 5.9, *Hazards Materials Handling*, hazardous materials used during operation and maintenance activities would include regulated substances such as sulfuric acid, hydrogen, and liquid ammonia. Hazardous materials used during Project operation would be contained within designated hazardous materials storage areas throughout the Project site. Procedures for the use and handling of hazardous materials during operation would be described within the Project-specific Hazardous Materials Business Plan (HMBP) and Spill Prevention, Control, and Countermeasure (SPCC) Plan. Operation of the solar facility, Options 1 and 2 step-up substation, and gen-tie components would not involve the routine transportation of hazardous materials to and from the Project site.

Operation of the solar facility, Options 1 and 2 step-up substation, and gen-tie would not involve grading activities or ground disturbance that would introduce the potential for erosion and sedimentation, as discussed above for construction-period impacts. Operation of the solar facility would involve using water to wash the solar panels up to four times per year. Water would only be applied in quantities necessary to remove dust from the panels to maintain their efficiency. Solar panel washing would not cause runoff or discharge such that water quality could be affected.

Operation of the solar facility, step-up substation, and gen-tie would not contribute to the degradation of water quality within a 303(d) listed waterbody. The Project's gen-tie line alignment would be constructed adjacent to Cantua Creek, which is on the 303(d) List; however, operation of the gen-tie lines would not introduce a substantial source of pollutants. The BMPs implemented during operation to reduce pollutants in stormwater runoff from the Project site would ensure that gen-tie operation does not contribute to the degradation of impaired water bodies. Potential impacts would be less than significant.

BESS

Construction

Less than Significant Impact. As shown in Figure 5.13-1 (see Section 5.13.1, *Groundwater*), the BESS Option 1 site is approximately centered within the solar facility, and the Option 2 site is located in the southwestern-most parcel of the solar facility, where the gen-tie corridor extends west from the solar facility site. Trenching and/or excavation activities required to install buried components would have potential to encounter perched groundwater, or water from irrigation return flows that is present within the Shallow Zone. As described above for the solar facility, step-up substation, and gen-tie, if dewatering is required to remove water from the work area, compliance with the Construction General Permit would require testing and treatment prior to discharge to ensure that the discharge meet or exceed the effluent limitations specified in the permit. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Under both siting options, the BESS would consist of battery banks housed in electrical enclosures and buried electrical conduit; operation of these facilities would not involve ground-disturbing activities that could impact water quality. The Project-specific HMBP and SPCC Plan described above for the solar facility, step-up substation, and gen-tie would also apply to the BESS Options 1 and 2. This Project component does not include injection of water or liquid wastes, and would have minimal potential for the spill or release of hazardous substances that could affect water quality standards or waste discharge requirements, due to the enclosed design of BESS components. Potential impacts would be less than significant.

Green Hydrogen

Construction

Less than Significant Impact. Construction of the green hydrogen facility, including the Options 1 and 2 component and the alternate component site, would involve ground-disturbing activities to prepare the site for placement of the electrolyzer and supporting components. Compliance with the Construction General Permit and implementation of the Project-specific SWPPP would include BMPs to stabilize disturbed soils, control for soil erosion and runoff, and minimize or avoid the potential for an inadvertent spill or leak of hazardous or potentially hazardous materials to occur. The Project-specific RMP would further minimize potential adverse impacts to water quality during construction of the green hydrogen facility. With implementation of the Project-specific SWPPP and RMP, construction of the green hydrogen facility would not violate a water quality permit or waste discharge requirement as a result of water quality degradation. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the green hydrogen facility would require a water supply for the electrolyzer to produce hydrogen via electrolysis. Water would also be required to conduct water quality treatment for the feedstock water, because the process of electrolysis requires very high-quality feedstock water. Therefore, a WTP and on-site RO system is included in Project design and would be operated as part of the green hydrogen components to produce the required demineralized water quality necessary for the electrolysis process. Operation of the RO system would produce a waste stream consisting of brine, with high concentrations of TDS.

As discussed in Section 5.13.1.5, *Wastewater,* liquid discharges from the RO system would be treated and reused as electrolyzer feedstock to the maximum extent feasible; this may include sending the liquid discharge through the Project's on-site WTP and RO system for further treatment. Liquid discharges may also be used in the Project's cooling system, consisting of a closed-loop dry cooling system that uses a water and glycol mixture for cooling exchangers through direct contact. The water and glycol cooling fluid would be pumped through rows of tubes with air blown across them, discharging heat from the cooling fluid into the atmosphere. Because the by-product waste of the RO system would be reused or properly disposed of by either a zero-liquid discharge and disposal at a nearby hazardous waste disposal facility, disposal in an existing or new disposal well, or by discharging to land through a State-approved establishment of "salt sink", potential for operation of the hydrogen facility to affect water quality permits or waste discharge regulation would be limited to the potential for accidental spill or leak of hazardous materials to occur. Potential impacts would be less than significant.

Utility Switchyard

Construction

Less than Significant Impact. Construction of the utility switchyard would involve grading and compaction of the site to an approximately level grade. Implementation of the Project's SWPPP, discussed above, would provide compliance with the NPDES Program and the State's Construction General Permit, and would include site-specific BMPs to minimize or avoid potential for ground disturbance of the Project to result in adverse impacts to water quality. Potential impacts would be less than significant.

Operation

Less than Significant Impact. As discussed in Section 5.13.1.3, *Stormwater*, the Project would introduce impermeable surfaces in the form of concrete footings and foundations, which could increase the rate and volume of stormwater runoff. Concrete pads at the utility switchyard would be limited to the foundations required for switchyard equipment, while the remaining area would be covered with gravel to a depth of up to 12 inches, thereby maximizing infiltration for the permeable portions of the utility switchyard. Project design includes detention basins placed throughout the Project site to control the rate and amount of stormwater runoff associated with each drainage area shown on Figure 5.13-12, *Existing Site Drainage.* Additionally, the Project-specific HMBP and SPCC Plan would be implemented across all Project features as needed, including the utility switchyard, and would minimize or avoid potential for operation of the switchyard to impact water quality or violate a water quality standard or waste discharge requirement. Potential impacts would be less than significant.

Overall Project

Less than Significant Impact. Construction of the Project would include ground-disturbing activities on more than one acre of land, thereby necessitating a site-specific SWPPP for compliance with the federal Clean Water Act (CWA) and the NPDES Program introduced in Section 402 of the CWA. The SWPPP would include construction and post-construction BMPs for stormwater management. The Project would introduce approximately 291 acres of new impervious surfaces that could result in site-specific increases in stormwater runoff and erosion. However, the Project would also result in an overall decrease in stormwater runoff leaving the site, due to the introduction of runoff control features and detention basins strategically placed throughout the Project site. The Project would also include a construction-period RMP, an operational-period HMBP, and an operational-period SPCC Plan to minimize or avoid adverse impacts to water quality from hazardous materials, including sediment and vehicle fuels. Construction and operation of the Project would not result in significant impacts to water quality, and would have minimal potential result in the violation of a water quality standard or waste discharge requirement. Potential impacts would be less than significant.

Impact WAT-2

Threshold:	Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Groundwater resources could be directly affected through groundwater production and use, or indirectly affected by altering recharge rates or patterns to the aquifer system. Impedance of sustainable groundwater management could occur if the Project would cause or exacerbate existing overdraft conditions, or physically interfere with PMAs identified in the Westside Subbasin GSP to reverse existing overdraft and restore balanced conditions.

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

Less than Significant Impact. Construction of the solar facility, Options 1 and 2 step-up substation, and gen-tie line would require a water supply during construction, primarily for dust suppression. The solar facility site would cover the majority of overall Project site, and the majority of water applied for dust suppression within the Project site would occur within the solar facility.

Two water supply sources would be used for the Project, as detailed in Section 5.13.1.6, *Water Supply,* under “Water Sources.”

Indirect effects to groundwater could result from changes to infiltration rates and patterns across the Project site. The site-specific SWPPP discussed under Impact WAT-1 would include BMPs to minimize or avoid drainage pattern alterations. If de-watering is required during construction, such activities would be conducted for consistency with the Construction General Permit to avoid adverse impacts to groundwater quality. Construction of the solar facility, Options 1 and 2 step-up substation, and gen-tie would be conducted to minimize or avoid direct and indirect adverse effects to local groundwater resources, and would not impede sustainable management of the Westside Subbasin. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the solar facility would require a water supply for the regular (anticipated to be quarterly) cleaning of the solar panels to maintain their efficiency. Water for operation of the solar facility portion of the Project would be provided through landowner groundwater allocations designated in the 2015 settlement agreement between USDOJ and WWD as well as in the confidential Option Agreement between WWD and the Applicant, for the transfer of Project site parcels to Project companies. It is conservatively assumed that 9,000 acres of land would be transferred, although the total acreage of Project parcels would be up to 9,116 acres. The conferred M&I rights consist of 2 AF of groundwater per 320 acres of land per year, providing up to 56 AFY for the Project.

Water demand for operation of the solar facility would be approximately 39 AFY, for washing solar panels. Sufficient groundwater allocations for solar development are available through site parcels to support this component of the Project. This supply source is considered sustainably available and reliable, due to it being defined by the 2015 settlement agreement and the Option Agreement between the Applicant and WWD, which is also the primary GSA for the Westside Subbasin. Operation of the step-up substation and the gen-tie would not require a water supply.

The presence of solar panels on the Project does not represent new impervious surfaces because precipitation would run off the surface of the panels to the underlying ground surface. The new step-up substation would include new impervious areas on portions of an approximately 20-acre site, primarily associated with concrete foundations and a prefabricated control building. However, neither potential site would have substantial indirect impacts to groundwater recharge through changes in infiltration rates and patterns, because both potential sites would represent approximately 0.22 percent of the overall Project site, and new impervious surfaces would only be introduced on necessary portions of the site. Operation of the gen-tie would not have potential to directly or indirectly decrease groundwater supply as no water supply would be required, and substantial new areas of impervious surfaces would not occur. New impervious surfaces for the gen-tie would be limited to gen-tie poles, which would not alter recharge to the overall groundwater basin. Potential impacts would be less than significant.

BESS

Construction

Less than Significant Impact. Construction of the BESS (both potential sites) would require a temporary water supply for dust suppression across the BESS site of up to 35 acres, or approximately 0.39 percent of the overall Project site of 9,000 acres. As described above, two water supply sources are being considered for the Project, including locally produced groundwater. However, groundwater would only be produced in amounts up to the allocations attached to the subject parcels through land ownership, as provided in the 2015 settlement agreement and the current Option Agreement between WWD and the Applicant. Therefore, potential impacts would be less than significant.

Operation

Less than Significant Impact. During operation of the BESS, new impervious surfaces would be associated with the electrical housing and underground conduit; however, these areas would be small compared to the surface area of the Westside Subbasin, and would not have potential to alter recharge rates or patterns such that groundwater supply would be substantially impacted.

Operation of the BESS would also include a water tank for emergency use as needed. This feature of the BESS component of the Project would not adversely affect groundwater supply because the quantity of water stored for emergency purposes would be included in the Project's overall water demands. Potential impacts would be less than significant.

Green Hydrogen

Construction

Less than Significant Impact. Construction of the green hydrogen facilities would require a temporary water supply for dust suppression during placement of the electrolyzer and construction of the WTP and RO system. As with other Project components, the area of disturbed land requiring dust suppression for the green hydrogen facilities would represent a small portion of the overall 9,000-acre Project site. As described previously, two water supply sources would be used for the Project, neither of which would result in net drawdown or overdraft in the Westside Subbasin.

Water for construction activities would be sourced from WWD and would consist of surplus surface water flows obtained through Supplemental Water and Turn-Back Pool water, and stored through groundwater banking for use as needed. As discussed in Section 5.13.1.6, *Water Supply*, as of October 2023, WWD has access to up to 43,000 AF of Supplemental Water and Turn-Back Pool water that may be acquired for the Project. Up to approximately 1,210 AF of water would be required for construction over a maximum duration of 36 months. There would be sufficient surplus water available to support Project construction. Additionally, the use of surplus surface water stored through banking would not have adverse impacts to groundwater supply or recharge, because only the amount of water banked would be retrieved for Project use. Construction water demands would not result in significant impacts.

Operation

Less than Significant with Mitigation. The majority of the Project's water demands would be associated with operation of the green hydrogen facility and the electrolysis processes required to create green hydrogen from ultra-pure water. As presented in Section 5.13.1.6, *Water Supply*, water for operation of the electrolyzer would be sourced from WWD as surplus surface water flows consisting of both Supplemental Water and Turn-Back Pool water and purchases directly from private landowners of excess allocations. Purchase of this wet weather surplus flow would occur based on water year 2022/2023 excess supply and put into storage in the Westside Subbasin aquifer for future use as needed. Storage would be conducted through groundwater banking using infiltration via field flooding techniques. Water banking credits would be generated through storage and WWD authorization, and the water would be extracted using onsite groundwater production wells (less leave-behind quantities) in future years.

As noted above, up to approximately 43,000 AF of this supply source is available through WWD as of October 2023. As shown in Table 5.13-7, water demand for operation of the electrolyzer would be 1,000 AFY, or approximately 20,000 AF total. As such, sufficient supply is anticipated to be available through surface water sources to support operation of the electrolyzer. The use of this supply source would not adversely impact groundwater storage and recharge because no more than the amount banked for the Project would be retrieved for use under the Project.

To ensure that sufficient water supply would be available to the Project and reliable for the green hydrogen facilities during Project operations, the Project would be required to implement Mitigation Measure WAT-1, *Water Supply Contingency Plan*. With implementation of Mitigation

Measure WAT-1, the Project would minimize or avoid potential to substantially decrease supplies in the Westside Subbasin or contribute to ongoing Critical Overdraft conditions. Impact WAT-2 would be less than significant with mitigation, for operation of the green hydrogen facilities.

Utility Switchyard

Construction

Less than Significant Impact. Construction of the utility switchyard would require a temporary water supply for dust suppression. As described above for other project components, construction water would be sourced from surplus surface water flows obtained through WWD which are of sufficient availability and reliability to support the Project's construction demands of up to 1,210 AF. The water supply sources for the Project have been designed to avoid adverse impacts to groundwater supply and recharge. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the utility switchyard would not require a water supply source, and would not result in direct impacts to groundwater. New impervious surfaces would be present during operation of the utility switchyard, associated with concrete footings and foundations for facilities including a radio tower, transmission line poles, and structures including a modular protection automation and control (MPAC) building and a battery enclosure area. The potential for these impervious areas to adversely affect groundwater recharge rates or patterns would be less than significant, as such changes would be highly site-specific, and because the entire utility switchyard area of approximately 40 acres represents just 0.42 percent of the overall Project area of 9,000 acres. Potential impacts would be less than significant.

Overall Project

Less than Significant with Mitigation. Table 5.13-10, below, provides a summary of the Project water demands over the required 20-year planning horizon, as well as an overview of the identified water supplies that would be implemented in tandem during this timeframe.

Table 5.13-10 20-year Project Water Demands and Available Supplies

Demand Type	Water Demand (AF)	Water Supply Source	Water Supply (AF)	Adequate Supply Available?
Groundwater				
PV solar and M&I	780 AF (39 AFY)	Land purchase with attached groundwater allocations	1,120 AF (56 AFY)	YES
Surface Water				
Construction[1]	1,210 AF	Surface water surplus flow banking	43,000 AF	YES
Electrolyzer	20,000 AF (1,000 AFY)			
Totals	**21,990 AF**		**44,120 AF**	**YES**

1. The construction water demand would range between 1,100 AF to 1,210 AF for the construction duration; for the purposes of this analysis, the most conservative annual use rate and total demand are considered.

Project construction would require up to 1,210 AF of water over a maximum construction period duration of 36 months. Construction water would be used for dust suppression and site preparation, and would not be applied in excess amounts that could result in infiltration to the underlying aquifer system. Construction water demands are not anticipated to adversely affect groundwater supplies because the Project's water supply sources are designed to avoid causing or contributing to existing overdraft conditions, and would not result in supply drawdown.

The overall Project would not interfere substantially with groundwater recharge through changes in recharge rates or patterns because ground cover under the Project would reduce the average runoff coefficient across the site from 0.49 to 0.45, meaning that less stormwater runoff would exit the site, and more water would recharge the underlying aquifer system through infiltration from detention basins throughout the Project site.

Operation of the Project would require approximately 1,039 AFY, of which approximately 96 percent, or 1,000 AFY, would be used as electrolyzer feedstock for the production of green hydrogen, and 39 AFY would be used for operation of the PV solar facility, primarily for washing the solar panels to maximize their efficiency. Water supply for operation of the solar facility would be obtained through groundwater allocations for solar development of up to 56 AF, based upon Project companies' ownership of 9,000 acres within the Project's solar development area.

Water supply for operation of the electrolyzer would be obtained as surplus surface water flows from WWD and private landowners, and would consist of Supplemental Water, Turn-Back Pool water, and excess allocations, then stored through banking for use by the Project. As of October 2023, WWD has access to up to 43,000 AF of surplus surface water flows that may be obtained for the Project, which is more than sufficient to support the Project's operational water demands. In addition, the Project's water supply sources are designed to avoid the creation or exacerbation of overdraft in the Westside Subbasin, and would not result in adverse impacts to the subbasin.

The CEQA Lead Agency for the Project would be the CEC, a certified regulatory agency and issues permits for renewable power plants 50 megawatts or larger in the State. It is anticipated that CEC as the Lead Agency would coordinate with WWD GSA for approval of any groundwater use. The WWD GSA would not approve use of the Westside Subbasin in a way that would decrease groundwater supplies or interfere with the sustainable management of the groundwater basin. As stated under "Green Hydrogen," operational impacts, to ensure that sufficient water supply would be available to the Project and reliable for the green hydrogen facilities during Project operations, and the Project would not result in adverse impacts to the Westside Subbasin, Mitigation Measure WAT-1, presented below, is recommended.

Mitigation Measures

Mitigation Measure WAT-1, *Water Supply Contingency Plan*, presented below, is recommended to minimize or avoid potential adverse impacts to groundwater resources and supply availability.

WAT-1 Water Supply Contingency Plan

A Water Supply Contingency Plan (WSCP) shall be developed and implemented for the Project to define how the Project's year-round and long-term water demands will be consistently met, and to identify management and monitoring activities to support sustainable water supply development for the Project. The WSCP shall include:

- Definition of the water supply sources, including the associated approvals and regulatory requirements; a Water Supply Assessment (WSA) for the Project may be included in the WSCP to satisfy this item.

- A comprehensive accounting of all water supply (in AFY) to be obtained from landowners that have agreed to sell surplus water supplies to Project companies and those that have agreed to sell land with attached water rights. Landowner information will remain confidential and will be shared only with the CEQA Lead Agency, as needed to demonstrate supply availability.
- A Monitoring and Reporting Plan (MRP) to document the accumulation and use of banked water through aquifer storage and recovery (ASR). The MRP shall also define the methods and approach necessary to provide accounting of banked water contributed to storage and removed from storage throughout the year.

The WSCP shall be subject to review and approval by the California Energy Commission, Westland Water District Groundwater Sustainability Agency (GSA), and the County of Fresno GSA-Westside prior to the start of Project construction.

Impact WAT-3

Threshold:	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: - Result in substantial erosion or siltation on- or off-site? - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

No components of the Project would alter the course of a stream or river. The impact analysis below addresses potential for the Project to result in erosion or siltation from drainage pattern alterations not involving the alteration of a stream or river.

Table 5.13-11, below, presents the runoff coefficients by land use type that would occur under the Project; the “runoff coefficient” is a dimensionless coefficient relating the amount of surface runoff to the amount of precipitation. The higher the runoff coefficient, the greater the amount of surface runoff would occur in response to precipitation events.

Table 5.13-11 Proposed Conditions Cover

Project Land Cover Type	Runoff Coefficient	Acres (portion of development area)
Roads, Substation, and BESS gravel	0.35	269.72 (3.0%)
O&M Pads and Piles	1.00	21.49 (0.2%)
Low-Maintenance Vegetation	0.45	8,605.99 (96.7%)
Total	n/a	8,897.60 (100%)

Source: IP Darden I, LLC 2023b

The table above shows that under the Project, the runoff coefficient across the Project site would range between 0.35 and 1.00 depending upon Project feature; in comparison, the existing condition of on-site crops has an associated runoff coefficient of 0.49. Under the Project, approximately 96.7 percent of the Project site would consist of low-maintenance vegetation with a runoff coefficient of 0.45. Therefore, the Project would reduce runoff compared to existing conditions prior to consideration of the Project’s detention basins.

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

Less than Significant Impact. The solar facility represents the majority of the Project site; therefore, ground disturbance across the solar facility site during Project construction would have greatest potential among the Project components to result in impacts from drainage pattern alterations. However, as discussed under Impact WAT-1, above, a site-specific SWPPP would be implemented throughout the construction period, and would include BMPs to minimize or avoid adverse effects associated with temporary ground disturbance during construction. Such BMPs may include but would not be limited to securing disturbed soils, placing straw wattles to prevent runoff from leaving the construction area, conducting appropriate handling and storage of any hazardous materials, use of grates and wash areas to prevent construction vehicles from tracking dust or substances outside the work area, and other measures as applicable. In addition, while construction of the solar facility, Options 1 and 2 step-up substation, and gen-tie would include ground disturbance throughout the Project site, construction would not substantially change the grade or elevation changes across the Project site, and would not cause substantial erosion or siltation on- or off-site.

Operation

Less than Significant Impact. During operation and maintenance of the solar facility, step-up substation, and gen-tie, site-specific drainage pattern alterations would be associated with permanent Project facilities for the solar facility (concrete footings and foundations), the step-up substation (transformer foundations, control building, microwave tower footings, dead-end structure footings), and the gen-tie line (concrete footings). To assess how these Project components would affect existing drainage patterns and subsequently have potential to cause erosion, siltation, or flooding, analysis of drainage was conducted through consideration of the 16 Drainage Areas defined in Figure 5.13-12 (see Section 5.13.1.2, *Surface Water*).

The proposed solar facilities would occur across all 16 Drainage Areas. Table 5.13-12, below, shows the rate of surface water runoff in cubic feet per second (cfs) under existing and proposed conditions for the Drainage Areas shown in Figure 5.13-12.

Table 5.13-12 100-year Storm, 48-hour Runoff, No Detention Basins

Project Drainage Basin ID#	Existing Condition (cfs)	Proposed Condition (cfs)
1	137.0	125.4
2	135.2	123.6
3	127.4	116.6
4	133.9	122.6
5	74.8	68.5
6	105.2	96.4
7	110.6	99.8
8	61.8	57.0
9	129.7	118.6
10	114.8	105.1

Project Drainage Basin ID#	Existing Condition (cfs)	Proposed Condition (cfs)
11	92.86	85.0
12	103.2	94.5
13	49.5	45.3
14	90.3	82.6
15	121.3	111.1
16	59.2	54.3
Total	1,646.7	1,506.4

Source: IP Darden I, LLC 2023b

The table above shows that under the Project, the rate of stormwater runoff from the 100-year storm event would be reduced in each of the 16 Drainage Areas because the site was designed to meet the water quality requirements of California and Fresno County to include the necessary detention basins to capture and treat runoff from impervious surfaces. Further, solar panels would be mounted above the ground with low maintenance natural vegetation below. Due to the area between and beneath the panels being vegetated, panels are not considered an impervious surface. While solar projects may require grading, the existing terrain is smoothed to accommodate array installation, rather than significant changes to grades or slopes, and the grading is designed to maintain existing drainage patterns. Access roads are installed at grade and allow for runoff to sheet flow through the proposed vegetation which provides treatment and reduction in runoff. The proposed substation, O&M pad, and BESS would be a raised pad and runoff from these areas would sheet flow to basins that outlet similar to existing conditions. In addition to typical stormwater management BMPs, the recommended approach for solar projects should include the following: limit the amount of impervious surfaces to reduce runoff, minimize the amount of grading to promote sheet flow, and the planting of natural vegetation on the site to provide both runoff reduction and treatment. The step-up substation Option 1 site is located in Drainage Area 8, and the step-up substation Option 2 site is within Drainage Area 1. Overall, stormwater runoff from the Project site would reduce from 1,647 cfs under existing conditions to 1,506 cfs under the Project.

The Project would include detention basins placed strategically throughout the site to reduce the rate and amount of stormwater runoff leaving the site. Table 5.13-13, below, characterizes detention basins for each of the 16 drainage areas. In the table, the first column for “storage volume required” indicates capacity needed to provide balanced conditions and avoid adverse effects from runoff, while the last column for “storage volume provided” indicates the actual storage capacity that would be provided by the Project. As shown, the Project would provide more storage capacity than necessary for balanced (inflow and outflow) conditions on the Project site, based upon 100-year storm conditions.

Table 5.13-13 Proposed Project On-site Detention Basins

Project Drainage Basin ID#	Storage volume required (acre-feet)	Water surface area (acres)	Basin floor area (acres)	Average water depth (feet)	Storage volume provided (acre-feet)
1	3.75	4.2	2.7	1.5	6.29
2	3.74	3.5	2.1	1.5	4.64
3	3.69	3.2	1.9	1.5	4.07
4	3.21	2.8	1.7	1.5	3.44
5	1.68	2.3	1.5	1.5	2.76
6	3.89	7.2	3.5	1.5	11.65
7	7.03	5.9	2.1	1.5	7.10
8	6.32	10.8	1.3	1.5	9.56
9	3.91	4.6	2.1	1.5	5.77
10	3.31	3.5	1.5	1.5	3.81
11	3.46	4.5	3.3	1.5	7.61
12	3.48	4.3	2	1.5	5.30
13	2.07	5.1	1.1	1.5	4.50
14	4.07	5.3	2	1.5	6.30
15	1.35	3	0.49	1.5	2.11
16	1.78	3.9	0.8	1.5	3.13
Total	**56.77**				**88.04**

Source: IP Darden I, LLC 2023b

Operation of Project components including the solar facility and step-up substation (Options 1 and 2) would reduce the site-specific runoff coefficient, and reduce the rate and amount of stormwater runoff leaving the Project site; therefore, the potential for on- or off-site erosion or sedimentation would also be reduced from existing conditions. The gen-tie line corridor is not included in the drainage areas reflected in the preceding Figure 5.13-12 and Table 5.13-11 through Table 5.13-13; however, permanent facilities within the gen-tie corridor are anticipated to be limited to concrete footings for the gen-tie. These footings would be spaced along the gen-tie line corridor and would not introduce substantial new impervious areas that would have potential to substantially increase runoff or contribute to erosion and siltation. Therefore, potential impacts associated with erosion and sedimentation from runoff would be less than significant.

BESS

Construction

Less than Significant Impact. Construction of BESS (both potential sites) would include implementation of the Project's SWPPP for the duration of construction, including BMPs to minimize or avoid conditions that could increase erosion or siltation on- or off-site. The type of BMPs described above for construction of the solar facility, step-up substation, and gen-tie, as discussed above, would also be implemented for construction of the BESS. Construction of the BESS within its site of up to 35 acres would not substantially change the grade or elevation changes across the Project site and would not cause substantial erosion or siltation on- or off-site.

Excavation activities required to install the buried electrical conduit portions of the BESS could result in encountering shallow water or perched groundwater, which would require dewatering activities to remove water from the active work area. If the dewatered water is disposed of via discharge to the ground surface, compliance with the Construction General Permit would require testing and treatment, if necessary, to ensure that the discharge meet or exceed the effluent limitations specified in the permit. If needed, dewatering activities associated with the BESS would be the same as described for Impact WAT-1 under “Solar Facility, Step-Up Substation, and Gen-Tie” and would not alter existing drainage patterns. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the BESS would not include ground-disturbing activities. Operational conditions for the BESS would be defined by the presence of the BESS facilities, including battery banks housed in electrical enclosures and buried electrical conduit. As discussed above for Impact WAT-2, site-specific drainage pattern alterations would be associated with permanent features of each Project component, including the BESS. As discussed above for the solar facility, step-up substation, and gen-tie, drainage pattern alterations would have generally beneficial effects because the rate and amount of stormwater runoff leaving the Project area would be reduced, subsequently also reducing the potential for erosion and sedimentation to occur.

Figure 5.13-12, presented above in the operational discussion for the solar facility, step-up substation, and gen-tie, presents the boundaries and drainage characteristics of 16 drainage areas across the Project site; the BESS Option 1 site is within Drainage Area 9, and the BESS Option 2 site is within Drainage Area 8. Table 5.13-14, below, provides an overview of runoff and drainage characteristics within the drainage areas containing the proposed BESS sites.

Table 5.13-14 BESS and Basin Storage Site Drainage Characteristics

Project Drainage Basin ID#	Runoff - Existing Condition (cfs)	Runoff - Proposed Condition (cfs)	Basin Storage Volume Required (acre-feet)	Basin Storage Volume Provided (acre-feet)
8	61.8	57.0	6.32	9.56
9	129.7	118.6	3.91	5.77

Source: IP Darden I, LLC 2023b

The table above shows that post-Project runoff conditions would be improved compared to existing conditions, as represented in the reduced rate of runoff (associated with the 100-year storm event) and the increased storage capacity provided by the Project (providing stormwater control for runoff associated with precipitation events larger than the 100-year storm or other factors). As mentioned above, the proposed BESS would be a raised pad and runoff from these areas will sheet flow to basins that outlet similar to existing conditions. Operation of the BESS Option 1 in Drainage Area 9 or BESS Option 2 in Drainage Area 8 would not result in drainage pattern alterations that would result in adverse impacts including substantial erosion or sedimentation on- or off-site. Potential impacts would be less than significant.

Green Hydrogen

Construction

Less than Significant Impact. Construction of the green hydrogen facilities would include ground-disturbing activities to create level foundations for placement of the electrolyzer and construction of the WTP and RO system. The Project's SWPPP would be implemented throughout construction, including BMPs to minimize or avoid conditions that could increase erosion or siltation on- or off-site. The type of BMPs described above for construction of the solar facility, step-up substation, and gen-tie, as discussed above, would also be implemented for construction of the green hydrogen facilities. Excavation activities are not anticipated to be necessary.

Operation

Less than Significant Impact. Operation of the green hydrogen facilities at the Options 1 and 2 and alternate sites would include conducting electrolysis by feeding ultra-pure water into the electrolyzer, as well as conducting water quality treatment at a WTP with RO systems located adjacent to the electrolyzer. Discharge from the water quality treatment processes and the electrolyzer would be treated for reuse or disposed of as a waste product.

Management of the Project's wastewater streams would be conducted to avoid direct discharge to open waterbodies.

During Project operation, wastewater would be associated with permanent toilet and sanitary facilities, brine from water quality treatment and RO/EDI, and liquid discharges from electrolyzer operation. Wastewater would be managed onsite in accordance with general waste discharge requirements pursuant to State and local requirements. Management of the waste streams noted above would not alter drainage patterns in a manner that could cause or increase erosion or siltation on- or off-site.

Table 5.13-15, below, provides an overview of runoff and drainage characteristics within the drainage areas containing the green hydrogen facility site Option 1 (Drainage Area 1) and the hydrogen facility Option 2 (Drainage Area 7).

Table 5.13-15 Hydrogen Facility and Basin Storage Site Drainage Characteristics

Project Drainage Basin ID#	Runoff – Existing Condition (cfs)	Runoff – Proposed Condition (cfs)	Basin Storage Volume Required (acre-feet)	Basin Storage Volume Provided (acre-feet)
1	137.0	125.4	3.75	6.29
7	110.6	99.8	7.03	7.10

Source: IP Darden I, LLC 2023b

The table above shows that post-Project runoff conditions for drainage areas containing the Options 1 and 2 green hydrogen facilities would be improved compared to existing conditions. The site's coverage with up to 12 inches of gravel would promote infiltration of surface water runoff, thereby minimizing potential for the site's grade change to result in erosion and sedimentation. Operation of the Option 1 and Option 2 green hydrogen facility would not result in drainage pattern alterations that would result in adverse impacts including substantial erosion or sedimentation on- or off-site. Potential impacts would be less than significant.

The alternate green hydrogen facility site is not located within the 16 Drainage Areas mapped on Figure 5.13-12; rather, it is located adjacent to the utility switchyard, west of I-5 and at the base of the foothills. Figure 5.13-11, presented in Section 5.13.1.2, *Surface Water*, under “Watersheds,” shows that changes in elevation and slope increase towards the foothills, where the alternate green hydrogen facility site is located. The hydrogen facility would be designed and graded to divert flow around the facility. Berms, stormwater basins, and other appropriate design features would be incorporated to prevent erosion, siltation, and alteration of drainage patterns. Potential impacts would be less than significant.

Utility Switchyard

Construction

Less than Significant Impact. Construction of the utility switchyard would include grading and compaction of the site, installation of concrete foundations for switchyard equipment, and placement of 12 inches of gravel across the exposed surfaces of the 40-acre site. As with the Project components discussed above, the Project’s SWPPP would be implemented throughout construction, including BMPs to minimize or avoid drainage pattern alterations that could increase erosion or siltation on- or off-site. The type of BMPs described above for construction of the solar facility, step-up substation, and gen-tie, as discussed above, would also be implemented for construction of the utility switchyard, and would include BMPs to minimize the movement of disturbed soils from the active work area.

The utility switchyard site is not located within the 16 Drainage Areas mapped on Figure 5.13-12; rather, it is the western-most Project component, positioned at the terminus of the gen-tie line , at the base of the foothills. Figure 5.13-11, presented in Section 5.13.1.2, *Surface Water*, under “Watersheds,” shows that changes in elevation and slope increase towards the foothills, where the utility switchyards site is located. The utility switchyard would be graded and compacted to a level condition during Project construction, which would increase ground-disturbing activities compared to construction of a comparable site located on level ground. The SWPPP BMPs would be implemented as needed to avoid erosion and siltation resulting from drainage pattern alterations during construction of the switchyard. Potential impacts would be less than significant.

Operation

Less than Significant Impact. During operation of the utility switchyard, no additional ground disturbing activities would occur. The site’s coverage with up to 12 inches of gravel would promote infiltration of surface water runoff, thereby minimizing potential for the site’s grade change to result in erosion and sedimentation. Additionally, the utility switchyard would include an on-site detention pond with a surface area of approximately 100,000 square feet, to provide stormwater management through the capture of runoff during precipitation events, so that discharges of stormwater can be controlled through releases from the detention pond. This would further minimize potential for the utility switchyard to result in on- or off-site erosion or sedimentation. Potential impacts would be less than significant.

Overall Project

Less than Significant Impact. As discussed above for the respective Project components, construction of the Project would include implementation of a project-specific SWPPP with BMPs to avoid or minimize the Project’s potential to result in erosion or siltation from drainage pattern alterations. Project construction would include ground-disturbing activities across the majority of the site to install the solar facility components and other Project features; however, potential impacts from construction would be less than significant with implementation of drainage control and erosion control BMPs in the Project SWPPP. During operation of the Project, drainage conditions across the site would be improved as represented by decreased stormwater discharges and increased stormwater detention capacity. Potential impacts associated with drainage pattern alterations causing erosion or siltation would be less than significant.

Impact WAT-4

Threshold:	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? - Impede or redirect flood flows?
Threshold:	Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

The Project site is not located within a tsunami or seiche zone, as discussed in Section 5.13.1.4, *Flooding and Inundation*; therefore, these topics are not addressed in the analysis below. Discussion of FEMA-designated Flood Hazard Areas is provided below as relevant.

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

Less than Significant Impact. As discussed under Impact WAT-3, construction of the solar facility, step-up substation, and gen-tie would not substantially alter drainage patterns of the site or area. A project-specific SWPPP and BMPs would be implemented throughout construction and would include measures to accomplish the following, among other effects: minimize or avoid stormwater flows leaving the Project site; minimize erosion or sedimentation that could affect water quality; and provide proper handling and use of potentially hazardous materials to avoid spills and provide appropriate clean-up as needed. Project construction also would not exceed the capacity of an existing or planned drainage system, including the agricultural drainage features along the northern Project boundary that would receive runoff flows from the Project site.

Portions of the solar facility site are located within FEMA-designated Flood Hazard Areas, as shown on Figure 5.13-16; in the event of a 100-year storm, the portions of the Project site that coincide with Zone A (areas with a 1 percent annual change of flooding) of FEMA-designated flood hazard areas would be subject to inundation. However, proper handling and storage of potentially hazardous materials during construction would minimize potential for the accidental release of materials due to inundation. As discussed in Impact WAT-1, hazardous materials necessary for Project activities would be properly stored and handled in compliance with existing laws and regulations, which would reduce the possibility of materials affecting water quality in the event of site inundation. Potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation and maintenance of the solar facility would include the maintenance of detention basins constructed throughout the solar facility site to control stormwater runoff and provide improved conditions than present. Improved conditions are reflected in post-Project runoff coefficients for the land cover consisting of low-maintenance vegetation, as well as reduced rates of stormwater runoff from the Project site. Table 5.13-13, provides an overview of detention basins by drainage area (based on the drainage areas defined in Figure 5.13-12). Operation of the solar facility, step-up substation, and gen-tie would not exceed the capacity of stormwater drainage systems.

As discussed in Section 5.13.1.4, *Flooding and Inundation,* and shown in Figure 5.13-16, portions of the northern and northeastern project site are within FEMA-designated Flood Hazard Areas; solar facilities may be placed in these areas. This figure also shows that a portion of the gen-tie corridor traverses a FEMA Flood Hazard area for roughly one mile, located west of the Project's solar facility site. The step-up substation Options 1 and 2 are not within a Flood Hazard Area. Under the Project, the PV panels would be supported on steel piles spaced approximately 18 feet apart, and the gen-tie line would be constructed on TSPs that would also be spaced apart, along the gen-tie corridor. Placement of these structures within a Flood Hazard Area would preserve the direction of flow and, given the small footprint size of individual poles (for the solar facility and the gen-tie), placement of individual structures would not substantially impede or redirect flood flows.

While the Project would not impede or redirect flood flows, the Project is subject to County and FEMA review and approval due to development within a floodplain. Pursuant to the County Code of Ordinances Section 15.48, a hydraulics analysis and supporting documentation is required to be submitted to the Fresno County Floodplain Administrator and to FEMA for review and approval. A hydraulics analysis was completed for the Project in 2022 (Intersect Power 2023a). Based on this analysis, a Letter of Map Revision (LOMR) or Conditional Letter of Map Revision (CLOMR) is not necessary because the Project would not substantially impede or redirect flood flows.

A new source of polluted runoff could be introduced during Project operation if operational activities for the solar facility, step-up substation, or gen-tie would result in substantial erosion and sedimentation, an accidental spill or release of hazardous materials, or comparable activities. However, as discussed in Impact WAT-1, hazardous materials would be properly stored and handled in compliance with existing laws and regulations, minimizing the potential for an accidental spill or release to occur, and providing effective and timely clean-up should an accidental spill occur. Potential impacts would be less than significant.

BESS

Construction

Less than Significant Impact. As described above for the solar facility, step-up substation, and gen-tie, construction of the BESS would not substantially alter drainage patterns of the site or area. The project-specific SWPPP and BMPs developed for the Project would apply equally to all Project components, including the BESS. Construction of the BESS would not create or contribute runoff water that would exceed drainage systems, impede or redirect flood flows, or create substantial new sources of polluted runoff. Potential impacts would be reduced or avoided through BMPs, and potential impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the BESS would not include ground-disturbing activities and as discussed under Impact WAT-3, would create improved runoff conditions than are currently present. The Project would result in decreased stormwater runoff across all drainage areas in the Project site and would include excess capacity to capture and store stormwater flows through use of the drainage basins placed throughout the Project site including within the BESS. Operation of the BESS would not create or contribute stormwater drainage that could exceed existing systems or provide sources of polluted runoff. Potential impacts would be less than significant.

Green Hydrogen

Construction

Less than Significant Impact. As discussed above for other Project components, construction of the hydrogen facility would not substantially alter drainage patterns of the site or area. The project-specific SWPPP and BMPs would avoid the creation of runoff water that would exceed drainage systems, impede or redirect flood flows, or create substantial new sources of polluted runoff. Potential impacts would be less than significant.

Operation

Less than Significant Impact. During operation of the green hydrogen facility, water quality treatment processes and operation of the electrolyzer would produce a waste stream consisting of high-TDS concentrations or brine. Section 5.13.1.5, *Wastewater*, describes water quality treatment and electrolyzer waste streams.

Operation of the green hydrogen facility would not create substantial additional sources of polluted runoff because, as described above, waste products generated by Project operations would be reused as possible and disposed of appropriately.

In addition, the green hydrogen facility Option 1 and Option 2 are located outside of areas identified as Flood Hazard Areas by FEMA; see Figure 5.13-16, presented in Section 5.13.1.4, *Flooding and Inundation*, under "Flood Hazard Areas." As shown therein, the Option 1 site is approximately centered within the solar facility development area, and the Option 2 site is in the southwestern portion of the solar facility development area, where the gen-tie line extends to the west. Both sites are outside the defined Flood Hazard Areas and would not create a substantial new source of polluted runoff or release pollutants as a result of being inundated from a 100-year storm event.

The eastern edge of the alternate green hydrogen site is located within an area identified as Flood Hazard Areas by FEMA, see Figure 5.13-16, presented in Section 5.13.1.4, *Flooding and Inundation*, under "Flood Hazard Areas." The *2D Hydraulic Study* (Intersect Power 2023a) indicates depth and velocity of stormwater flows at the alternate green hydrogen site are minimal due to the flat nature of the terrain.

The alternate green hydrogen facility would be designed and graded to divert flow around the facility without impeding or redirecting flood flows. Stormwater drainage features such as berms, detention basins, and other best management practices would be implemented to avoid or minimize potential interference with existing flood flows. The project would not substantially alter existing drainage patterns. Potential impacts would be less than significant.

Utility Switchyard

Construction

Less than Significant Impact. As discussed above for other Project components, construction of the hydrogen facility would not substantially alter drainage patterns of the site or area. The project-specific SWPPP and BMPs would avoid the creation of runoff water that would exceed drainage systems, impede or redirect flood flows, or create substantial new sources of polluted runoff. Potential impacts would be less than significant.

Operation

Less than Significant Impact. As discussed under Impact WAT-1, the majority of the utility switchyard site would be covered with gravel to a depth of up to 12 inches, thereby maximizing infiltration for the portions of the utility switchyard not consisting of concrete footings or foundations to support utility switchyard infrastructure. Operation of the utility switchyard would not cause the exceedance of a stormwater drainage system or impede or redirect flood flows.

The Project-specific HMBP and SPCC Plan would be implemented during the operational period and would minimize or avoid potential for water quality degradation through polluted runoff to occur as a result of the utility switchyard. Potential impacts would be less than significant.

Overall Project

Less than Significant Impact. As discussed under Impact WAT-3, construction and operation of the Project would not substantially alter the existing drainage pattern of the site or area, including through the addition of impervious surfaces. In addition, the Project would result in improved stormwater runoff conditions, by reducing the runoff coefficient across much of the Project site (by introducing low maintenance vegetation across the solar facility), and would reduce existing runoff rates and quantities through the use of detention basins placed strategically throughout the drainage areas portrayed in Figure 3.13-3. Therefore, the Project would not create or contribute runoff water that would exceed the capacity of existing stormwater drainage systems, and it would reduce existing stormwater runoff entering the drainage system, which consists of agricultural ditches and culverts in the northern portion of the Project site, where runoff concentrates.

The analysis provided above also describes that while portions of the Project site, particularly the solar facility and alternate hydrogen location, are within FEMA-designated Flood Hazard Areas, subject to inundation as a result of the 100-year storm event. Construction and operation of the Project would include implementation of a Project-specific SWPPP with BMPs to protect water quality, including through erosion control and proper handling of hazardous materials. Project operation would also involve implementation of an RMP and HMBP to ensure the proper use, handling, and storage of hazardous materials. With these plans and BMPs implemented as part of the Project, potential impacts associated with runoff water and the risk of releasing pollutants including as a result of inundation would be less than significant.

Impact WAT-5

Threshold:	Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Section 5.13.1.1, *Groundwater*, introduces the water quality control plan applicable to the Project area, the Tulare Lake Basin Plan, administered by the Central Valley RWQCB. Section 5.13.1 also introduces the groundwater sustainability management plan applicable to the Project area, the Westside Subbasin GSP, administered by the WWD GSA and the County of Fresno GSA-Westside.

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

No impact. Construction of the solar facility, step-up substation, and gen-tie would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Operation

Less than Significant with Mitigation. Operation of the step-up substation and gen-tie would not require a water supply source. Operation of the solar facility would require water for panel washing, with water sourced from groundwater using allocations attached to land ownership of parcels that would be conferred to Project companies. In accordance with the 2015 settlement agreement and the confidential Option Agreement between WWD and the Applicant, 2 AFY of groundwater may be produced for every 320 acres of land owned within the Westside Subbasin. This amount is sustainable and would not result in drawdown or exacerbated overdraft because it was determined by WWD as a GSA for the Westside Subbasin, and is consistent with the purpose of SGMA to create and maintain sustainable groundwater conditions. Therefore, use of groundwater allocations to support operation of the solar facility would not result in the violation of a water quality control plan or sustainable groundwater management plan.

Any use of water from the Westside Subbasin would be subject to the approval of the WWD GSA and the County of Fresno GSA-Westside; see Section 5.13.1.1, *Groundwater*, under "Groundwater Management." The Project would not result in violation of a groundwater sustainability management plan because the GSAs responsible for the Westside Subbasin would not approve use that would be counter to the sustainability goals and objectives of the Westside Subbasin GSP. Mitigation Measure WAT-1, *Water Supply Contingency Plan*, recommended under Impact WAT-2, would demonstrate how water demands of the Project would be met during dry weather conditions, and further support the conclusion that the Project would not conflict with sustainable management of the Westside Subbasin.

BESS

Construction

No Impact. Construction of the BESS would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Operation

No Impact. Operation of the BESS would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Green Hydrogen

Construction

No Impact. Construction of the green hydrogen facilities would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Operation

Less than Significant with Mitigation. Operation of the green hydrogen facilities would include water quality treatment for both the feedstock water developed for the electrolyzer, as well as for the brine stream resulting from the electrolysis process. As discussed under Impact WAT-4, the hydrogen facility would not create substantial additional sources of polluted runoff because, as described above, waste products generated by Project operations would be reused as possible and disposed of appropriately. Operation of the hydrogen facility, including discharges from water quality treatment and electrolysis processes, would not increase salinity concentrations by properly treating and disposing of waste streams.

Operation of the green hydrogen facility accounts for the majority of the Project's water demands, as detailed under Impact WAT-2. Water supply for operation of the Project electrolyzer would be sourced from surplus surface water obtained through WWD and private landowners and stored via groundwater banking for use as needed. This supply scenario has been designed to avoid contributing to or exacerbating existing overdraft conditions in the Westside Subbasin.

Mitigation Measure WAT-1 is recommended to demonstrate sufficient water supply would be available to the Project and reliable for the green hydrogen facilities throughout operations, and that the Project would not adversely affect supply in the Westside Subbasin.

Utility Switchyard

Construction

No Impact. Construction of the utility switchyard would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Operation

No Impact. Operation of the utility switchyard would not result in water quality impacts (Impact WAT-1) or impacts to groundwater resources (Impact WAT-2) such that the violation of a water quality control plan or sustainable groundwater management plan would occur.

Overall Project

Less than Significant with Mitigation. As discussed above, the Project would not conflict with implementation of the Tulare Lake Basin Plan, which is the local water quality control plan. The

Project also would not conflict with or obstruct the Westside Subbasin GSP, as implementation of Mitigation Measure WAT-1 would demonstrate water supply reliability for the Project's long-term demands associated with cleaning the solar panels and providing feedstock for the electrolyzer. The purpose of the Westside Subbasin GSP is to reverse overdraft conditions in the Westside Subbasin, and to maintain sustainable (balanced) conditions into the future. To demonstrate the Project would not impede overdraft recovery, which would conflict with the Westside Subbasin GSP, Mitigation Measure WAT-1 is recommended to demonstrate how the Project's water demands would be met year-round, including during dry conditions which restrict the availability of some sources. Potential impacts would be less than significant.

Mitigation Measures

Mitigation Measure WAT-1, presented under Impact WAT 2, is recommended to demonstrate water supply reliability during varying climatic and drought conditions.

5.13.4 Cumulative Impacts

Impacts of the Project would be considered cumulatively considerable if they would have the potential to combine with other past, present, or reasonably foreseeable projects to become significant.

Overall Project

The Project would not substantially degrade surface water quality or groundwater quality and would not violate water quality standards or waste discharge requirements (Impact WAT-1); therefore, no cumulative impacts associated with water quality would occur.

The Project also would not introduce drainage pattern alterations that would result in erosion, siltation, or flooding on- or off-site (Impact WAT-3), create or contribute runoff water that would exceed the capacity of an existing or planned drainage system, impede or redirect flood flows, or risk release of pollutants due to inundation (Impact WAT-4). Therefore, the Project would not contribute to cumulative impacts associated with ground disturbance and erosion, flooding, water quality, or stormwater drainage.

Cumulative impacts to groundwater supply could occur if Project activities would contribute to or exacerbate existing overdraft conditions in the Westside Subbasin. However, as discussed under Impact WAT-2, the Project would not result in drawdown of the basin and would not contribute to existing overdraft. The Project would implement Mitigation Measure WAT-1, *Water Supply Contingency Plan*, to ensure sufficient supply reliability for the Project through varying climatic (drought) conditions, and to minimize impacts to groundwater and avoid the Project activities causing or contributing to overdraft conditions.

Implementation of Mitigation Measure WAT-1 would minimize the Project's potential contribution to the cumulative scenario for groundwater resources and groundwater supply. By monitoring groundwater during Project operations and ensuring sufficient supply availability for the Project including during drought conditions, the Project would not cause impacts to groundwater that would combine with similar impacts of other projects within the Westside Subbasin to result in significant cumulative impacts. Therefore, potential cumulative impacts associated with decreasing groundwater supplies (Impact WAT-2) or interference with a sustainable groundwater management plan (Impact WAT-5) would be less than significant.

Utility Switchyard

Construction and operation of the utility switchyard is considered in the cumulative impact analysis of the overall Project discussed above; therefore, as with the overall Project, cumulative impacts related to water resources, including groundwater supply and sustainable groundwater management, would be less than significant.

Alternative Water Supply Sources

Appendix B Requirement (E), item (v) requires discussion of alternative water supply sources and alternative cooling technologies, if using fresh water. As described herein, water supply for the Project would be obtained from groundwater allocations and surface surplus water and storage.

Alternative cooling technologies under consideration include the use of liquid discharges from water quality treatment and electrolysis in the electrolyzer cooling system (see Impact WAT-4).

5.13.5 Laws, Ordinances, Regulations, and Standards

Table 5.13-16, below, lists the LORS determined to be applicable to water resources, including the topics of surface water, groundwater, flooding, stormwater, and water quality. LORS related to residential and community developments, and other land uses that do not represent the Project's proposed uses are not presented below because they have been determined to not apply to the Project. LORS related to wastewater collection, treatment, and disposal are not listed below, because the Project would not introduce a new wastewater stream or treatment system.

Table 5.13-16 LORS Applicable to Water Resources

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Federal	Clean Water Act (CWA)	Section 303(d), Impaired Water Bodies; Section 404, discharge to federal waters; Section 401, Water Quality Certification; Section 402, NPDES	Impact WAT-1	The Project would comply with all regulatory requirements of the CWA
Federal	Underground Injection Control (UIC) Program	The installation of new injection wells would require UIC permits, such as for conducting Aquifer Storage and Recovery (ASR)	Impact WAT-2 Impact WAT-5	The Project would comply with all permit requirements for injection wells.
State	Porter Cologne Water Quality Control Act	The Water Quality Control Plan for the Tulare Lake Basin sets forth beneficial use objectives and water quality standards for the Project area.	Impact WAT-1	The Project would comply with water quality standards and would not conflict with beneficial uses set forth in the Tulare Lake Basin Plan.
State	Sustainable Groundwater Management Act	Groundwater is managed by Groundwater Sustainability Agencies (GSAs) under a Groundwater Sustainability Plan (GSP).	Impact WAT-2 Impact WAT-5	The Project would be implemented in coordination with the GSAs and would not conflict with implementation of the GSP.

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Local	Fresno County Code of Ordinances: Title 14, Chapter 14.04 and Chapter 14.08	These chapters of Title 14 include requirements for groundwater well drilling and operation.	Impact WAT-1 Impact WAT-2 Impact WAT-5	The Project would adhere to all requirements regarding well construction and operation.
	Fresno County General Plan: Policy PF-C.1 through Policy PF-C.24	These policies aim to increase local water supply availability, improve water conservation, reverse local overdraft, and ensure that new developments include a verifiable, reliable water supply source(s) to support the project for at least 20 years.	Impact WAT-1 Impact WAT-2 Impact WAT-3 Impact WAT-4 Impact WAT-5	The Project would comply with policies including for water supply, by using supply sources that avoid local groundwater drawdown, overdraft, and other adverse effects.

Sources: California Code of Regulations, Fresno County Code of Ordinances, Fresno County 2000, Fresno County 2023

5.13.5.1 Federal LORS

Clean Water Act

The federal CWA (33 United States Code [U.S.C.] § 1251 et seq.) and subsequent amendments outline the protocol for regulating discharges of pollutants to federally jurisdictional waters of the U.S. It is the primary federal law applicable to water quality of the nation's surface waters, including lakes, rivers, and coastal wetlands, and was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," implemented by the USEPA. In California, the USEPA has delegated regulatory authority for CWA implementation to the SWRCB and the nine RWQCBs.

Section 303(d), Impaired Waterbodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires states to identify waters where adopted water quality standards and beneficial uses are still unattained. These lists of prioritized impaired waterbodies, known as the "303(d) lists," are submitted to the USEPA every two years. The law requires the development of total maximum daily load (TMDL) criteria to improve water quality of impaired waterbodies. States develop TMDLs for impaired waterbodies to maintain beneficial uses, achieve water quality objectives, and reduce the potential for future water quality degradation. A TMDL must account for point and non-point sources, where point source pollution is any contaminant entering the environment from an easily identified location, and non-point source pollution is a diffuse source of pollution that occurs over a wider area, including stormwater runoff.

Section 404, Placement of Dredge or Fill Material into Waters of the U.S.

The USACE is responsible for issuing permits under CWA Section 404 for placement of dredge or fill material into waters of the U.S., which can include oceans, bays, rivers, streams (including non-perennial streams with a defined bed and bank), lakes, ponds, and seasonal and perennial wetlands. CWA Section 404 requires Project proponents to obtain a permit from the USACE for all discharges of fill or dredged material into waters of the U.S. before proceeding with a proposed activity. The USACE may issue either an individual permit or a general permit.

Section 401, Water Quality Certification

Section 401 of the CWA specifies that the SWRCB or applicable RWQCB must certify that any federal action meets with state water quality standards, (23 California Code of Regulations § 3830, et seq.). California has a policy of no net loss of wetlands, which the SWRCB and RWQCBs address by requiring mitigation for dredge and fill impacts to wetlands and waterways. Dredge and fill activities in wetlands and waterways that impact waters of the U.S. require a CWA Section 404 permit from the USACE. A CWA Section 401 WQC must be obtained from the Central Valley RWQCB prior to issuance of a Section 404 permit.

Section 402, National Pollution Discharge Elimination System

The SWRCB and the RWQCBs implement and enforce the federal NPDES program in California. Established in 1972, the NPDES regulations initially focused on municipal and industrial wastewater discharges, followed by stormwater discharge regulations that became effective in December 1990. NPDES permits provide two levels of control: technology-based limits which are based on the ability of dischargers to treat wastewater, and water quality-based limits, which are required if technology-based limits are not sufficient to protect the waterbody. Additionally, stormwater permitting for construction site discharges is described below under state regulations.

Underground Injection Control (UIC) Program

The United States Environmental Protection Agency (EPA) oversees the Underground Injection Control (UIC) Program, which consists of six classes of injection wells. Each well class is based on the type and depth of the injection activity, and the potential for that injection activity to result in endangerment of a USDW. UIC regulations mandate the consideration of measures to assure that injection activities will not endanger USDWs. The concept of endangerment is defined in the code of federal regulations (40 CFR 144.12). Section 144.12 Prohibition of movement of fluid into underground sources of drinking water:

a) No owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 142 or may otherwise adversely affect the health of persons.

   Based on consultation with the EPA’s UIC Program office, an UIC permit is not required if the system is a closed loop where the caverns and associated shafts from the surface to the caverns are lined such that there would be no fluid communication (either air or water) with the external environment. Characterization of the surrounding bedrock of the cavern system will be conducted to demonstrate that the rock mechanics are sufficient to provide a hydraulicly isolated system with performance standards equivalent to lining. If the unlined cavern will function similarly to a lined cavern and behave as a closed loop system where water temporarily placed in the cavern during the power generation cycle will not be injected into the surrounding formation, then the caverns may not be lined.

   An unlined cavern may be considered by EPA to be a Class V Wells for Injection of Non-Hazardous Fluids into or Above Underground Sources of Drinking Water. Examples of Class V wells include stormwater, drainage wells, septic system leach fields and agricultural drainage wells. Examples of complex Class V wells include aquifer storage and recovery wells, geothermal electric power wells, and deep injection wells for salinity control.

The EPA has established the following minimum requirements to prevent injection wells from contaminating underground sources of drinking water (USDWs). In most cases Class V wells are "authorized by rule." "Authorized by rule" means that an injection well may be operated without a permit as long as the owners or operators:

- Submit inventory information to their permitting authority and verify that they are authorized (allowed) to inject. The permitting authority will review the information to be sure that the well will not endanger a USDW.
- Operate the wells in a way that does not endanger USDWs. The permitting authority will explain any specific requirements.
- Properly close their Class V well when it is no longer being used. The well should be closed in a way that prevents movement of any contaminated fluids into USDWs.

After reviewing an owner or operator's inventory information, the EPA may determine that an individual permit is necessary to prevent USDW contamination (https://www.epa.gov/uic/federal-requirements-class-v-wells).

In California, the SWRCB would also be involved with any water injection into the formation under Waste Discharge Requirements.

5.13.5.2 State LORS

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act ("Porter-Cologne"), established by CWC Division 7, is the state law governing the water quality of all state waters, including surface waters and groundwater. Under Porter-Cologne, the SWRCB has authority over water quality policy on a state-wide level, and the nine RWQCBs establish and implement water quality standards specific to their respective region. The Project is located within the Central Valley and subject to the authority of the Central Valley RWQCB, which jointly implements the federal CWA and the state Porter-Cologne Water Quality Control Act to regulate water quality in the project area.

Sustainable Groundwater Management Act

In 2014, SGMA established a framework for local groundwater management under which the DWR assigns priority levels to groundwater basins based on existing water balance conditions. The purpose of SGMA is to bring groundwater basins into sustainable conditions by 2040, and to maintain sustainable conditions in the future. To accomplish this, groundwater basins are required to be managed by DWR-approved GSAs, which are then required to develop and implement a GSP for each of their respective basins. See Section 5.13.1.1, *Groundwater*, under "Sustainable Groundwater Management Act" for further discussion of SGMA as relevant to the Project site.

5.13.5.3 Local LORS

Fresno County is the lead review agency for the Project, as defined by CWC Section 10910(b). The Fresno County General Plan requires a review of all development proposals within the county to ensure adequate water is available, protect water supplies for projected growth, and review of new high consumptive uses for adequate waste supplies in addition to groundwater. The project site is not located within the service area of a public water system.

Fresno County directs developers interested in drilling a new well in a critically overdrafted subbasin to consult with the appropriate GSA to determine if there are any limitations regarding the use of the well and if they have any other requirements. The Project would not result in a net loss of groundwater from the Westside Subbasin, based upon use of the two separate and complementary water supply sources outlined in Section 5.13.1.6, *Water Supply*.

New groundwater production or monitoring wells will also need to be permitted through the County. The Fresno County Department of Public Health, Environmental Health Division enforces the provisions of the following, related to new wells:

- Fresno County Ordinance Code, Title 14, primarily Chapters 14.04 and 14.08
- Fresno County General Plan Policy PF-C, specifically PF-C.19 and PF-C.20

In order to obtain a permit to drill a well, properly licensed contractors shall submit a completed Well Permit Form in the Citizen Portal along with a plot plan and applicable permit fees to the Fresno County Department of Public Health (DPH) Environmental Health Division (EHD).

Fresno County Code of Ordinances

The Fresno County Code of Ordinances (County Code), Title 14, contains the following applicable to the Project, as it is anticipated that existing and/or new groundwater wells would be required, including for production, injection, and monitoring:

- **Chapter 14.04 – Well Regulations.** This chapter and Chapter 14.08 shall apply to the construction, repair, reconstruction, change of use or destruction of any well as hereinafter defined or the installation, or reinstallation, of any pump used or to be used for domestic, industrial, commercial or agricultural purposes.
- **Chapter 14.08 – Well Construction, Pump Installation, and Well Destruction Standards.** This chapter contains the requirements and standards for well siting and design.

Fresno County General Plan

The Fresno County General Plan contains water resources policies applicable to the Project, including, but not limited to:

- **Policy PF-C.1:** The County shall actively engage in efforts and support the efforts of others to retain existing water supplies within Fresno County.
- **Policy PF-C.2** The County shall actively engage in efforts and support the efforts of others to import flood, surplus, and other available waters for use in Fresno County.
- **Policy PF-C.3** To reduce demand on the county’s groundwater resources, the County shall encourage the use of surface water to the maximum extent feasible.
- **Policy PF-C.4** The County shall support efforts to expand groundwater and/or surface water storage that benefits Fresno County.
- **Policy PF-C.5** The County shall develop a County water budget to determine long-term needs and to determine whether existing and planned water resource enhancements will meet the county’s needs over the twenty (20) year General Plan horizon.
- **Policy PF-C.6** The County shall support water banking when the program has local sponsorship and involvement and provides new benefits to the County.
- **Policy PF-C.7** The County shall recommend to all cities and urban areas within the county that they adopt the most cost-effective urban best management practices (BMPs) published and

updated by the California Urban Water Agencies, California Department of Water Resources, or other appropriate agencies as a means of meeting some of the future water supply needs.

- **Policy PF-C.8** The County shall require preparation of water master plans for areas undergoing urban growth.
- **Policy PF-C.9** The County shall work with local irrigation districts to preserve local water rights and supply.
- **Policy PF-C.10** The County shall require any community water system in new residential subdivisions to be owned and operated by a public entity.
- **Policy PF-C.11** The County shall assure an on-going water supply to help sustain agriculture and accommodate future growth by allocation of resources necessary to carry out the water resource management programs.
- **Policy PF-C.12** The County shall approve new development only if an adequate sustainable water supply to serve such development is demonstrated.
- **Policy PF-C.13** In those areas identified as having severe groundwater level declines or limited groundwater availability, the County shall limit development to uses that do not have high water usage or that can be served by a surface water supply.
- **Policy PF-C.14** The County shall require that water supplies serving new development meet US Environmental Protection Agency and California Department of Health Services and other water quality and quantity standards.
- **Policy PF-C.15** The County shall require that surface water used to serve new development be treated in accordance with the requirements of the California Surface Water Treatment Rule (California Code of Regulations, Title 22, Division 4, Chapter 17).
- **Policy PF-C.16** If the cumulative effects of more intensive land use proposals are detrimental to the water supplies of surrounding areas, the County shall require approval of the project to be dependent upon adequate mitigation. The County shall require that costs of mitigating such adverse impacts to water supplies be borne proportionately by all parties to the proposal.
- **Policy PF-C.17** The County shall, prior to consideration of any discretionary project related to land use, undertake a water supply evaluation. The evaluation shall include the following:
    a. A determination that the water supply is adequate to meet the highest demand that could be permitted on the lands in question. If surface water is proposed, it must come from a reliable source and the supply must be made “firm” by water banking or other suitable arrangement. If groundwater is proposed, a hydrogeologic investigation may be required to confirm the availability of water in amounts necessary to meet project demand. If the lands in question lie in an area of limited groundwater, a hydrogeologic investigation shall be required.
    b. A determination of the impact that use of the proposed water supply will have on other water users in Fresno County. If use of surface water is proposed, its use must not have a significant negative impact on agriculture or other water users within Fresno County. If use of groundwater is proposed, a hydrogeologic investigation may be required.

       If the lands in question lie in an area of limited groundwater, a hydrogeologic investigation shall be required. Should the investigation determine that significant pumping-related physical impacts will extend beyond the boundary of the property in question, those impacts shall be mitigated.
    c. A determination that the proposed water supply is sustainable or that there is an acceptable plan to achieve sustainability. The plan must be structured such that it is economically,

environmentally, and technically feasible. In addition, its implementation must occur prior to long-term and/or irreversible physical impacts, or significant economic hardship, to surrounding water users.

- **Policy PF-C.18** In the case of lands entitled to surface water, the County shall approve only land use-related projects that provide for or participate in effective utilization of the surface water entitlement such as:
  a. Constructing facilities for the treatment and delivery of surface water to lands in question;
  b. Developing facilities for groundwater recharge of the surface water entitlement;
  c. Participating in the activities of a public agency charged with the responsibility for recharge of available water supplies for the beneficial use of the subject lands.
- **Policy PF-C.19** The County shall discourage the proliferation of small community water systems.
- **Policy PF-C.20** The County shall not permit new private water wells within areas served by a public water system.
- **Policy PF-C.21** The County shall promote the use of surface water for agricultural use to reduce groundwater table reductions.
- **Policy PF-C.22** The County supports short-term water transfers as a means for local water agencies to maintain flexibility in meeting water supply requirements. The County shall support long-term transfer, assignment, or sale of water and/or water entitlements to users outside of the County only under the following circumstances:
  a. The impacts of the transfer on Fresno County are mitigated;
  b. The transfer is part of a long-term solution to the region's water supply shortfall; and
  c. The transfer will not result in a net decrease in the availability of surface and/or groundwater to water users within Fresno County.
- **Policy PF-C.23** The County shall regulate the transfer of groundwater for use outside of Fresno County. The regulation shall extend to the substitution of groundwater for transferred surface water.
- **Policy PF-C.24** The County shall encourage the transfer of unused or surplus agricultural water to urban uses within Fresno County.

5.13.6 Agencies and Agency Contact

Table 5.13-17, below, provides an overview of regulatory agencies and contacts for water resources.

Table 5.13-17 Agency Contacts for Water Resources

Issue	Agency	Contact
Stormwater discharges in non-federal waters - Order 2009-0009-DWQ, amended by Order 2010-0014-DWQ and 2012-0006-DWQ	Central Valley Regional Water Quality Control Plan (RWQCB)	Fresno Office: 559-445-5116
Dredge and fill activities in non-federally jurisdictional wetlands and waterways - CWA Section 401; Porter-Cologne	Central Valley RWQCB	Fresno Office: 559-445-5116

Issue	Agency	Contact
Construction of a new injection well that could affect an underground source of drinking water (USDW) - Underground Injection Control (UIC) Program; Safe Drinking Water Act	California Department of Conservation, Geologic Energy Management Division (CalGEM)	CalGEM Central District (Bakersfield): 661-322-4031
Activities within the Westside Subbasin that could affect groundwater – Sustainable Groundwater Management Act	Westlands Water District (WWD) Groundwater Sustainability Agency (GSA) and County of Fresno GSA-Westside	WWD (Fresno Office): 559-224-1523 County of Fresno:[1] 559-224-1523
Installation of new groundwater wells in unincorporated Fresno County	Fresno County Department of Public Health (DPH) - Environmental Health Division (EHD)	Fresno County DPH EHD: 559-600-3357

1. The County of Fresno GSA-Westside point of contact is through the Water and Natural Resources Division of the Department of Public Works and Planning.

5.13.7 Permits and Permit Schedule

Table 5.13-18, below, provides an overview of regulatory permits for water resources and requirements for permit applications.

Table 5.13-18 Permit Application Requirements for Federal and State LORS

Permit, Authority, and Trigger	Requirements for Permit Application / Rationale for Non-Applicability
NPDES Construction General Permit: ▪ USACE - CWA Section 404 ▪ Discharge of dredge or fill material to Waters of the U.S.	Not applicable. Preliminary jurisdictional delineation and analysis of the Project site indicate no federally jurisdictional Waters of the US are present. Therefore, the Project would not have potential to discharge dredge or fill material to Waters of the US, and the Project does not require NPDES Construction General Permit compliance under CWA Section 404.
NPDES Statewide General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities: ▪ Central Valley RWQCB - Order 2009-0009-DWQ, amended by Order 2010-0014-DWQ and 2012-0006-DWQ) ▪ Stormwater discharges in non-federal waters	Applicable. Under the Porter-Cologne Water Quality Control Act ("Porter-Cologne"), the SWRCB via the RWQCBs administers California's stormwater permitting program; construction projects disturbing more than one acre of land require coverage under the General Permit for stormwater with a site-specific Stormwater Pollution Prevention Plan (SWPPP) and BMPs to manage runoff. Requirements for application for coverage under the General Permit include: ▪ Set up an account with Stormwater Multiple Application and Report Tracking System (SMARTS), the State's online project application and reporting system. ▪ Electronically submit all required permit registration documents, including: ▫ Site Risk Assessment ▫ Site-specific SWPPP, documenting all proposed stormwater control measures and BMPs, and describing how each measure will prevent discharge under the project, including maps and runoff calculations ▫ Construction Site Monitoring Plan ▫ Site Map ▪ Send the project-specific acreage-based Permit fee to the SWRCB.
Water Quality Certification (WQC) ▪ Central Valley RWQCB – CWA Section 401; CWA Section 303(d)	Not applicable. Because the Project does not require a Section 404 permit due to there being no federally jurisdictional waters present, the Project also does not require a CWA Section 401 Water Quality Certification (WQC), which address discharges to federally jurisdictional wetlands and waterways. However, in addition to WQC

Permit, Authority, and Trigger	Requirements for Permit Application / Rationale for Non-Applicability
▪ Dredge and fill activities in federally jurisdictional wetlands and waterways	requirements for federal waters, the CWA Section 401 also conducts Waste Discharge Requirements (WDRs) for non-federal waters; see discussion below.
Waste Discharge Requirements (WDR) ▪ Central Valley RWQCB – CWA Section 401; Porter-Cologne ▪ Dredge and fill activities in non-federally jurisdictional wetlands and waterways	Applicable. The Project would require WDR permit(s) for industrial waste discharges, which are regulated by the WDR Programs under CWA Section 401. General WDRs require compliance with applicable Basin Plan provisions, prohibitions, and water quality objectives governing the discharge. Basin Plans are required by Porter-Cologne to protect non-federal waters of the State. Application for coverage under a General WDR requires: ▪ Notice of Intent (NOI) to comply with the terms and conditions of the General WDRs or a Report of Waste Discharge (ROWD) ▪ Applicable first annual fee as required by Title 23, CCR, Section 2200 ▪ Detailed project map ▪ Evidence of California Environmental Quality Act (CEQA) compliance ▪ Discharger Monitoring Plan. include ground-disturbing activities that could affect natural depressions, drainage ditches, and irrigation conveyance channels on or adjacent to the Project site.
NPDES Statewide General Permit for Stormwater Discharges Associated with Industrial Activities ▪ Central Valley RWQCB - Order 2014-0057-DWQ ▪ Industrial stormwater discharges to Waters of the US.	Not applicable. The Stormwater General Permit implements the federally required stormwater regulations in California for stormwater from industrial activities discharging to Waters of the US. The Project would not discharge to Waters of the US and is not subject to this permit. The Project would still implement a SWPPP for compliance with Porter-Cologne and the Construction General Permit, discussed above.
Industrial Pretreatment Permits[1] ▪ Discharge of industrial wastewater to a wastewater treatment provider	Not applicable. The Project is not located within the service area of any wastewater treatment provider, and is not subject to industrial pretreatment permits for such facilities. The Project would still comply with CWA Section 401 WDRs for land discharges.
Underground Injection Control (UIC) Program (CalGEM 2023) ▪ California Department of Conservation (DOC), Geologic Energy Management Division (CalGEM); SDWA ▪ Construction of a new injection well that could affect an underground source of drinking water (USDW)	Applicable. States implement the Safe Drinking Water Act (SDWA) on behalf of the USEPA through UIC Programs designed to protect USDWs by setting minimum requirements for injection wells that could affect USDWs. If the Project's water supply scenario includes such well(s), or if wastewater from the Project would be disposed of through underground injection, UIC program compliance would be required. The specific purpose of the well determines application requirements; all UIC permit applications require an Engineering Study, Geologic Study, and Injection Plan. ▪ **Engineering Study** including: ▫ Statement of project purpose ▫ Reservoir and fluid characteristics of each injection zone ▫ Planned well drilling and plugging and abandonment program to complete the project, including a flood-pattern map showing all injection, production, and plugged and abandoned wells, and unit boundaries ▫ Casing diagrams for all idle, plugged and abandoned, and deeper-zone producing wells within the area affected by the project

[1] Industrial Pretreatment permits are issued by wastewater treatment agencies for industrial flows received by wastewater treatment facilities; the Project site is not within the service area of any wastewater treatment facilities.

Permit, Authority, and Trigger	Requirements for Permit Application / Rationale for Non-Applicability
	▫ Evidence that plugged and abandoned wells in the area will not have an adverse effect on the project or cause damage to life, health, property, or natural resources ▪ **Geologic Study** including a structural and isopach map, cross section, and a representative electric log identifying all geologic units, formations, freshwater aquifers, and oil or gas zones. (▪ I**njection Plan** including: ▫ Map showing all injection facilities ▫ Maximum anticipated injection pressure and volumes ▫ Monitoring system or method used to ensure that injection fluid is confined to the intended zone or zones of injection ▫ Method of injection ▫ Corrosion protective measures ▫ The source, analysis, and treatment of the injection fluid ▫ Location and depth of water-source wells to be used in conjunction with the project.

5.13.8 References

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