7.22 New or Modified Facilities

Implementation of the proposed Plan amendments would reduce Sacramento/Delta water supplies at certain times and locations. In response, water users could increase efforts to prioritize limited available water supplies and/or develop other water supply sources. Other water sources are already being developed and utilized in response to water shortages that occur as a result of many factors. While the proposed Plan amendments are not the driving impetus for sustainable management and water supply diversification efforts, the proposed Plan amendments may accelerate and increase the need for such efforts.

This section addresses actions that entities may take that would involve construction to modify or build new facilities and infrastructure to supplement or conserve surface water supplies and other construction projects that may result from implementation of the proposed Plan amendments. Projects include new or modified dams/reservoirs and points of diversion; groundwater wells and groundwater storage and recovery projects; and new or modified drinking water treatment plants, including desalination plants and wastewater treatment plants (WWTPs). This section also evaluates other construction projects that entities may take in response to changes in hydrology and water supply under the proposed Plan amendments, including new or modified boat ramps, streamflow or temperature monitoring devices, and water conservation projects such as canal lining. Note that the environmental effects of groundwater pumping and other water management actions (without new construction) are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20. Operational impacts of increased use of groundwater, groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures are cross-referenced in this section as appropriate. The potential for new or modified facilities to result in population growth is evaluated in Section 7.23, *Cumulative Impact Analysis, Growth-Inducing Effects, and Significant and Irreversible Changes*.

The evaluation presented in this section utilizes existing environmental documentation and other available information related to the construction of new or modified facilities to identify the potential impacts of these actions on the various resource areas as well as mitigation measures. Documents reviewed for these purposes include, but are not limited to, the following.

- *Antioch Brackish Water Desalination Facility Draft Environmental Impact Report* (ESA 2018).
- *Calaveras Dam Replacement Project Environmental Impact Report* (SFPUC 2011).
- *Carlsbad Precise Development Plan and Desalination Plant Environmental Impact Report* (San Diego County Water Authority 2006).
- *City of Palo Alto Recycled Water Project Environmental Impact Report* (City of Palo Alto 2015).
- *Contra Costa Canal Replacement Project, Contra Costa County, CA, Final Environmental Assessment* (Reclamation 2007).
- *Davis-Woodland Water Supply Project Aquifer Storage and Recovery Supplemental Environmental Impact Report* (ESA 2015).
- *Davis-Woodland Water Supply Project Environmental Impact Report* (City of Davis 2007).
- *Delta Plan Program Environmental Impact Report* (^DSC 2011).

- *Final Environmental Impact Report for the Stanislaus County Discretionary Well Permitting and Management Program* (Stanislaus County Department of Environmental Resources 2018).
- *Final Staff Report Including the Final Substitute Environmental Documentation—Amendment to the Water Quality Control Plan for Ocean Waters of California Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (SWRCB 2015b).
- *Mitigated Negative Declaration: Chorro Creek Stream Gages*: (City of Morro Bay 2015).
- *North Basin Groundwater Monitoring Well Project Initial Study/Mitigated Negative Declaration* (Orange County Water District 2017).
- *Palmdale Regional Groundwater Recharge and Recovery Project Environmental Impact Report* (HELIX 2016).
- *State Water Resources Control Board Restoration Projects Statewide Order Program Environmental Impact Report* (SWRCB 2022).
- *San Luis Low Point Improvement Project Environmental Impact Statement/Environmental Impact Report* (Reclamation and Valley Water 2019).
- *Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (Sites Project Authority and Reclamation 2021).

This evaluation assumes that all responsible entities will conduct, as appropriate, site-specific environmental analyses to evaluate project-level environmental impacts, alternatives, and mitigation measures. This evaluation also assumes that responsible entities will design, evaluate, and implement studies, pilot projects, management practices, and controls as appropriate in compliance with all applicable laws, regulations, ordinances, and relevant municipal and/or agency codes, standards, and practices.

This section evaluates construction impacts that are specific to the new or modified facilities identified as potential response actions related to implementation of the proposed Plan amendments. Construction work can result in potentially significant impacts, and specific mitigation will apply to avoid or minimize environmental impacts from these types of projects. The magnitude of construction impacts of any project depends on the extent and duration of disturbance to existing resources. Most large construction projects require state and local agencies to conduct an independent CEQA environmental review. (Pub. Resources Code, §§ 21000 et seq.) Projects subject to CEQA include any activity which may cause a physical change in the environment that is either directly undertaken by any public agency or requires discretionary approval by a public agency through funding or regulatory approval. An Initial Study is used to decide whether to prepare a Negative Declaration if the proposed project will have no potential for significant impacts, or an Environmental Impact Report (EIR) if the project will have a significant effect on the environment. The EIR is a detailed report that identifies potentially significant environmental impacts and measures to avoid or mitigate those impacts, if feasible. CEQA requires agencies to prepare a written statement of overriding considerations when they decide to approve a project that will cause one or more significant effects on the environment that cannot be mitigated.

Construction projects that require federal approval or funding must comply with the National Environmental Policy Act (NEPA). (42 U.S.C § 4321 et seq.) Under NEPA, an environmental assessment (EA) or environmental impact statement (EIS) is prepared if an action will have significant adverse effects on the human environment. Both CEQA and NEPA provide for public

review and comment and are intended to provide decision makers with the necessary information to make a well-informed decision. CEQA and NEPA compliance provides a mechanism for identifying and mitigating construction impacts in all resource categories.

In addition, construction projects on public land are subject to resource plans that include provisions that mitigate construction impacts in most resource categories. These planning documents, sometimes called resource management plans, provide coordinated direction for the development and management of recreation lands, waters, and facilities, and serve as the basis for guiding resource management activities in a manner that maintains and enhances public and resource benefits. Projects on public land are developed and implemented through detailed and site-specific activity planning and any necessary environmental analysis. The plans are likely to regulate one or more of the following resource areas: aesthetics, air quality, cultural resources, forestry and fire management, land use, livestock management, geology and minerals, hazards, recreation, water, and wildlife habitat.

Construction projects on private land are subject to local county and city jurisdictions that mitigate construction impacts in most resource categories. In reviewing and making decisions on applications for various land use entitlements and development projects, the local government agency must typically make findings that the proposed activity (e.g., a conditional use permit or a subdivision of real property) is consistent with the applicable general plan. Each county and city has numerous policies and regulations that are outlined in each jurisdiction's respective general plan, municipal service review, or other regulatory framework (e.g., zoning ordinance, performance standards, other municipal or county programs). General plans address land use, housing, circulation, conservation, noise, safety, and open space (Gov. Code, § 65302) and may include additional elements. Development in California must be consistent with both the general plan and zoning, and many construction projects will need to comply with the local jurisdiction's general plan and zoning regulations. This compliance may be adequate mitigation in some circumstances, as regulatory compliance can serve as mitigation. Some policies relate specifically to construction and are directly applicable to construction impacts and mitigation, while other policies are more general and may relate more to project siting decisions or project operation.

General plans and zoning ordinances are likely to regulate the following resource areas: hydrology and water resources, biological resources, land use and planning, agriculture and forestry, aesthetics, air quality, cultural resources, geology and soils, mineral resources, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, utilities and service systems, and greenhouse gas (GHG) emissions. The discussion below and in Appendix E, *Regulatory Framework for Construction Projects*, includes examples of local requirements from representative general plans, but these are not intended to provide an exhaustive list of requirements. The study area spans 54 counties, each of which is subject to general plans and ordinances, as well as city plans. Project proponents must consult their local planning department to determine the specific permitting and other requirements that apply to a specific project in a given jurisdiction.

Appendix E provides an overview of key federal, state, and local laws, policies, and regulations applicable to construction projects in general that could effectively avoid or minimize impacts of typical construction activities. Mitigation measures to avoid, minimize, or offset potential environmental impacts may include seasonal work windows, preconstruction biological surveys; biological monitoring during construction; construction noise and light reduction measures; traffic

control; stormwater pollution prevention plan (SWPPP); spill prevention, control, and countermeasure plan; and turbidity compliance monitoring.

Extensive permitting requirements exist for construction and operation of many of the types of facilities evaluated in this section. Most of the new or modified facilities that entities may undertake involve larger-scale projects that would be subject to project-level CEQA analysis, which would entail project-specific identification of any potential significant environmental effects and mitigation measures. Implementation of mitigation measures would be within the responsibility and jurisdiction of lead and responsible agencies undertaking or approving these new or modified facility actions.

The new or modified facility actions described in this section also would likely need approval from the State Water Board or the applicable regional water board authorizing changes or new water rights and/or discharges of waste associated with individual projects. As a responsible agency, the State Water Board or regional water board would require implementation of mitigation measures that reduce water quality and other impacts within that Board's jurisdiction to less-than-significant levels. Depending on the specific project, implementing mitigation measures may not fully reduce significant impacts, and such impacts may remain potentially significant after mitigation. Until a specific project is proposed, specific impacts are identified and analyzed, and potential mitigation measures are implemented, the impacts remain potentially significant.

7.22.1 Description of New or Modified Facilities

7.22.1.1 Reservoirs and Points of Diversion

Although uncommon in California, new reservoirs may be proposed to improve water supply reliability. New water supply projects could enhance California's water resiliency if designed and operated in a manner that does not exacerbate existing pressures on the Delta ecosystem. A few locations have been identified where new, large-scale reservoirs may be developed, including the proposed Sites Reservoir in the Sacramento Valley and Temperance Flat Reservoir on the upper San Joaquin River. Water diverters on the smaller unregulated tributaries subject to flow requirements may choose to construct surface water storage facilities as well. Reservoirs vary in size from a small pond to a large lake. Reservoirs can be located on-stream, where water is impounded in place, or off-stream, where the reservoir is located away from the streambed and supplied by a pipeline or aqueduct. Reservoirs inundate land, modify and diminish natural flows, and can impede fish migration if located on a stream. Constructing a dam involves diverting the river, preparing the foundation and building the dam (concrete or embankment), filling the reservoir, testing the valves and floodgates, and monitoring. New reservoirs would likely include the construction of associated facilities, including canals, pipelines, electrical substations, administrative and maintenance buildings, and bridges across reservoirs or access roads.

Modification and expansion of existing reservoirs can increase storage capacity by increasing dam height, which would involve increasing the capacity or footprint of an existing reservoir and would likely involve construction and modification of the reservoir's existing system facilities. For example, the Los Vaqueros expansion project east of San Francisco proposes to raise the existing dam over 55 feet to expand the capacity of the reservoir from 160 thousand acre-feet (TAF) to 275 TAF. Raising a dam to expand the size of an existing reservoir involves activities described for new reservoirs, but on a smaller scale, and adjacent to and within the footprint of an existing facility.

Another method of reservoir expansion is to dredge from the existing reservoir's bed, creating additional storage capacity without expanding the footprint of the reservoir. As water is captured behind a dam, sediment settles at the bottom, accumulates, and ultimately fills the base of the reservoir. Dredging typically requires the use of a barge-mounted, portable hydraulic dredger, which must be transported to the site and launched into the reservoir. The sediment, as it is extracted from the base of the reservoir, is then piped to a nearby sediment basin or trucked to an approved off-site disposal area. Dredging also requires preparing staging areas and identifying an appropriate disposal area. In some cases, dredged material may be suitable for beneficial reuse projects such as wetland creation and restoration, levee maintenance, construction fill, and daily cover at sanitary landfills.

Points of diversion are locations where water is being drawn from a surface water source such as a river or reservoir. A new point of diversion associated with a new reservoir could be located at or near the reservoir or downstream of where water is released. New or changed points of diversion may also be proposed independent of a reservoir to make water delivery more accessible and efficient. For example, DWR and Reclamation have previously submitted petitions to add points of diversion of water on the Sacramento River associated with the California WaterFix Project (now titled Delta Conveyance Project). New points of diversion would likely include the construction of associated facilities, including pumping plants, water conveyance pipelines and canals, and sediment settling and drying basins. In addition, smaller modifications to agricultural and municipal diversion intakes may be required in response to changes to hydrology under the proposed Plan amendments. As analyzed in Impact AG-a under *Stream and Reservoir Elevation at Diversions* (refer to *Changes in Hydrology* in Subsection 7.4.3 of Section 7.4, *Agriculture and Forest Resources*), and in Impact UT-d under *Stream and Reservoir Elevation at Diversions* (refer to *Changes in Hydrology* in Subsection 7.20.3 of Section 7.20, *Utilities and Service Systems*), if river, stream, or reservoir water elevations are reduced to levels below existing intakes such that water cannot be diverted, intakes/diversion structures would require modification to maintain functionality.

The types of modifications of diversion intakes that could be implemented are varied and would be dependent on multiple variables including type and location of the existing intake(s). For smaller projects, modifications could be temporary (i.e., seasonal) or permanent, direct (i.e., physical modification of the existing intake) or indirect (i.e., channel modification near the intake). For example, a temporary, instream rock weir could be installed near an intake to provide adequate water surface elevation over an existing intake that may become exposed with low flows, or existing vertical turbine pumps could be replaced with submersible pumps.

Construction of a new and modified reservoir and diversion facilities may include demolition, excavation, construction of concrete structures, tunnelling, fill, and regrading operations. Construction activities could include new or relocation of roads, utilities, and other structures. Construction may include clearing of vegetation to construct temporary roads, staging, and storage areas; placement of temporary structures (e.g., cofferdams) to isolate work areas from flowing water; clearing, grading, and armoring of the channel and banks; and pile driving. Typical construction may require the use of heavy equipment, including cranes, excavators, pile drivers, bulldozers, backhoes, scrapers, dump trucks, and front-end loaders. Construction would include significant amounts of in-water work and a long construction period.

For larger projects, new or modified reservoirs and points of diversion would require extensive analysis and evaluation and would likely have significant environmental impacts. New or modified reservoirs and points of diversion would require State Water Board approval of either a new water

right, or a change of an existing right. Acquisition of a post-1914 appropriative water right requires a permit to develop the project and divert water in accordance with conditions and within a time schedule. A change to conditions of an existing post-1914 water right requires State Water Board processing and approval of a petition. Hydrologic analyses, diversion criteria, and water availability analyses would be necessary to make the requisite findings for approval. Discharges of waste that could affect the quality of the waters of the state would require authorization from the State Water Board and/or regional water board. Construction projects that involve discharges to waters of the United States require a permit from USACE under Clean Water Act section 404 and accompanying water quality certification under Clean Water Act section 401. Any new or modified facility would undergo CEQA evaluation prior to construction. Prior to construction, intake locations would need to be evaluated to meet a variety of criteria. This evaluation may include impacts on fish and terrestrial species, land use impacts, and impacts on river geomorphology, hydraulics, and design. Any new or modified facility would undergo extensive hydrologic modeling of operations and analysis of impacts on the aquatic ecosystem and fish species, water quality, surface water, and water supply.

New or modified reservoirs and points of diversion can help facilitate water transfers. Note that the environmental effects of increased use of water transfers using existing infrastructure is evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (under *Other Water Management Actions*). Information on water transfers is presented in Chapter 6, *Changes in Hydrology and Water Supply* (see Section 6.6.1.2, *Water Transfers*), and in Chapter 7, *Environmental Analysis (*see subsection *Water Transfers* in Section 7.1.4.4, *Reasonably Foreseeable Methods of Compliance and Response Actions*).

7.22.1.2 Groundwater Wells and Groundwater Storage and Recovery

In response to reduced Sacramento/Delta water supplies, agricultural and municipal water diverters and providers may develop new wells to supplement their supplies with groundwater. In addition, groundwater storage and recovery projects may be constructed to facilitate conjunctive use, which is the coordinated management of surface water and groundwater to improve the sustainability of the resource. Conjunctive use can be an effective approach in long-term water supply planning, so long as it does not impair the quality and sustainability of either water source.

Installation of a new groundwater well could include a tank, pump station, masonry walls, landscaping, site access, grading and paving, and associated improvements. Most modern wells are drilled, which requires a drill rig, often mounted on a large truck. Minimum standards for surface seals have been set by the California Department of Water Resources (DWR) (DWR Bulletin 74–90 [1991]). Generally, the footprint of disturbed ground for groundwater well installations is small. DWR's California Well Standards (1991) recommend that water, sediment, and other wastes removed from a well development site be disposed of in accordance with applicable federal, state, and local requirements. Well construction dewatering, including dewatering of excavated material, and disposal of water used for pump testing are typically covered by General National Pollutant Discharge Elimination System (NPDES) permits for low or limited threat discharges that are issued by the regional water boards. Well owners may need to obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of a well.

Groundwater wells would be drilled using a truck-mounted drill and may have a concrete pad to support any aboveground pump(s). Drilled wells are constructed by percussion or rotary-drilling machines and can be thousands of feet deep (USEPA 2023). In agricultural areas, groundwater wells

generally do not require separate construction or grading permits because they involve a small footprint with few associated water distribution pipes. For example, the Yolo County Water Well Application requires setbacks (e.g., for animal enclosures, levees, hazardous materials storage), well construction specifications, and contractor acknowledgement to protect adjacent properties and public rights-of-way from damage, illicit discharges, and stormwater pollution (Yolo County n.d.). No additional construction documentation, permitting, or reporting is required. Wells installed in urban or suburban areas may result in more ground disturbance depending on how many wells are developed on a site. One or more small enclosures would likely be built around the well(s), fencing would be installed around the area, and connections to water distribution pipes would be required.

New groundwater wells would include facility inspection and maintenance activities. Facility inspection and well maintenance could include measuring the depth of the groundwater, which could be collected by hand with a battery-operated wire-line sounder. Groundwater samples for laboratory analysis could use submersible pumps, which are operated by a small portable generator for periodic sampling.

The regulatory requirements for construction of new wells vary based on the intended use. Domestic wells must be drilled by a licensed contractor and must meet applicable local and/or state well standards (Harter 2003; SWRCB 2015a). For municipal wells, drinking water standards are set at levels necessary to protect the public from acute and chronic health risks associated with consuming contaminants in drinking water supplies. In both cases, wells must be sited away from septic systems and other pollutant sources, and in a location where routine maintenance and testing can be performed on a regular schedule (DWR 1991). Well construction would be required to comply with state and local building codes; this includes adherence to proper storage and disposal of the drill cuttings/spoils.

California does not have a water right permit process for groundwater use. Case law recognizes overlying and appropriative rights to groundwater, analogous to riparian and appropriative rights to surface water. An overlying groundwater right is generally senior and attaches to land overlying a groundwater basin. An appropriative groundwater right is a water right that applies to (1) water users that pump water from a groundwater basin but do not own the land upon which the water is used that overlies the groundwater basin; or (2) water users that sell or distribute the water to another water user. Groundwater may be appropriated for use outside the basin, although appropriator's rights are subordinate to those with overlying rights. In most areas of California, overlying landowners may extract percolating groundwater and put it to beneficial use without approval from the State Water Board or a court. In several basins, however, groundwater use is subject to regulation in accordance with court decrees adjudicating the groundwater rights within the basins.

All water rights, including groundwater, are subject to the requirements of the reasonable use doctrine, among other limitations. (See United States v. State Water Resources Control Board (1986) 182 Cal. App. 3d 82, 105-06.) The reasonable use doctrine of article X, section 2 of the California Constitution imposes an "overriding constitutional limitation" on all water rights in California. (Ibid.) In addition, the Legislature passed the Sustainable Groundwater Management Act (SGMA) to address excessive groundwater pumping and consequences of that over-extraction. SGMA requires local agencies to adopt sustainability plans for high- and medium-priority groundwater basins. (See subsection 7.12.2.2, *Environmental Setting – Sustainable Groundwater Management Act and Other State and Local Authorities* in Section 7.12.2, *Groundwater*, for additional discussion of SGMA.)

Groundwater storage and recovery involves storage of water for later recovery by intentionally recharging groundwater basins when excess surface water or other water sources are available. Surface water can be stored actively using injection wells. Water can come from streams during high runoff but can also utilize treated wastewater, stormwater, and agricultural runoff. Information on groundwater storage and recovery is provided in Chapter 6, *Changes in Hydrology and Water Supply* (see subsection 6.6.1.1, *Groundwater Storage and Recovery*), and in Chapter 7, *Environmental Analysis (*see subsection 7.1.4.4, *Reasonably Foreseeable Methods of Compliance and Response Actions – Changes in Water Supply – Other Water Management Actions – Groundwater Storage and Recovery/Conjunctive Use*).

Groundwater storage and recovery projects include land and appurtenant facilities, including extraction and injection wells, recharge ponds and spreading grounds, treatment and conveyance systems, and monitoring devices. Typical storage components are gravity recharge basins or injection wells that move water under pressure from the surface to an aquifer. Injection wells may be newly installed or may be retrofitted extraction wells already in place. Typical water extraction components are wells that pump groundwater from the aquifer and send the water to an existing treatment facility or directly into a distribution system for beneficial use.

For recharge using surface water, a water right is required to capture stream flows, including peak storm events, for groundwater recharge and later beneficial use. Except where the storage and beneficial use are authorized under an existing appropriative right, or a change in an existing right, filing an application with the State Water Board to obtain a water right permit would be required. In the water right application, an applicant would specify the beneficial uses (e.g., municipal, irrigation, water quality) of the water diverted to underground storage. The State Water Board has developed a streamlined permitting process for diversions of water from winter high-flow events to underground storage (Executive Order B-39-17). Stormwater discharges regulated through NPDES permits may also act as a resource and recharge to groundwater when properly managed. The regional water boards are actively involved in initiatives to improve the management of stormwater as a resource. Projects that propose to replenish groundwater with recycled water, where the recycled water comes directly from a WWTP and is not conveyed using a surface water stream system or a subterranean stream does not require a water right. A wastewater change petition pursuant to Water Code section 1211 may be necessary if the wastewater was previously discharged to a stream.

Note that the environmental effects of increased use of groundwater and groundwater storage and recovery using existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (*Other Water Management Actions*). This section focuses on the construction impacts of these actions.

7.22.1.3 Water Treatment Facilities

In response to reduced Sacramento/Delta water supplies, drinking water providers may need to rely on other sources of water that are lower in quality and require additional treatment. A new or expanded drinking water treatment plant may need to be constructed. In addition, changes in hydrology and water supply may require or result in construction of new water treatment facilities or expansion of existing facilities as analyzed in Impact UT-b under *Changes in Hydrology and Water Supply* (refer to Section 7.20, *Utilities and Service Systems*). Municipalities and wastewater treatment service providers may construct new WWTPs or modify existing WWTPs to support the development of recycled water sources to augment water supply at facilities that are large enough to

have existing WWTP infrastructure (e.g., Sacramento, Los Angeles, San Diego). Information on water recycling is in Chapter 6, *Changes in Hydrology and Water Supply* (see subsection 6.6.1.3, *Recycled Water*), and in Chapter 7, *Environmental Analysis (*see subsection 7.1.4.4, *Reasonably Foreseeable Methods of Compliance and Response Actions – Changes in Water Supply – Other Water Management Actions – Water Recycling*).

In addition, changes in hydrology and water supply may require or result in construction of new or modified wastewater treatment facilities or expansion of existing facilities as analyzed in Impact UT-b under *Changes in Hydrology and Water Supply* (refer to Section 7.20, *Utilities and Service Systems*).

Construction of new water treatment facilities typically requires construction of new water conveyance infrastructure, treatment facilities, treated water facilities, emergency overflow facilities, chemical and equipment storage facilities, power infrastructure, pump stations, and site access. Typical construction equipment includes dozers, haul trucks, front-end loaders, and scrapers. Typical construction activities include demolition and site clearing, excavation, pipe installation, backfill operations, grading, construction of facilities, and site restoration. Debris would likely require hauling off site. Fill material would be imported to the site or harvested on site from excavated areas. Concrete would be imported to the site, resulting in hauling and delivery truck trips. In preparation for construction, a project site would be cleared and prepared, and construction equipment and materials would be stored within construction work areas. Construction timeline assumptions would need to consider construction and installation of the intake wells, pipelines, treatment facility, storage, and related facilities. Typical construction equipment would include drilling rigs, pipe trailers, flatbed trucks, haul trucks, cranes, air compressors, excavators, backhoes, loaders, boom trucks, pavers and rollers, bulldozers, concrete transport trucks, concrete pump trucks, generators, compaction equipment, arc welding machines, skip loaders, drill rigs, and forklifts. Excess spoils and construction debris would require disposal. Construction and operation of water treatment facilities are highly regulated, and any such project would be required to comply with these regulations. In addition, because such facilities would be publicly owned by water supply purveyors and service districts or WWTP service districts and subject to CEQA, any new projects would undergo the appropriate level of CEQA and other required regulatory compliance at the time they are proposed.

Drinking Water Treatment Plants

Drinking water treatment plants range from simple structures, such as a single groundwater well in a small enclosure or building, to much larger facilities, such as a city drinking water plant. Regulation of drinking water is discussed in more detail in the *Environmental Setting* sections of Section 7.12.1.2, *Surface Water* and Section 7.12.2.2, *Groundwater*.

Water systems that serve drinking water are required to meet all drinking water standards, and suppliers must conduct routine sampling and analysis of their drinking water supplies to certify compliance. Drinking water standards are set at levels necessary to protect the public from acute and chronic health risks associated with consuming contaminants in drinking water supplies. These limits are known as *maximum contaminant levels*. A permit for operation from the Division of Drinking Water (DDW) is required for systems with 15 or more connections. To meet drinking water standards, water may be treated differently in different communities depending on the quality of the water that enters the treatment plant. Typically, surface water requires more treatment and filtration than groundwater because lakes, rivers, and streams contain more

sediment and pollutants and are more likely to be contaminated than groundwater. Treatment for drinking water production involves removal of contaminants from raw water to produce water that meets drinking water standards. Substances that are removed during the process of drinking water treatment include suspended solids, bacteria, algae, viruses, fungi, nitrate, arsenic, and minerals such as iron and manganese. The processes involved in removing the contaminants include physical processes such as settling and filtration, chemical processes such as disinfection and coagulation, and biological processes such as slow sand filtration.

Treatment of groundwater that would be used for drinking water could also require treatment systems and facilities. Granular activated carbon (GAC) is a common method for treating groundwater. This method uses activated carbon to adsorb contaminants and remove them from the water. GAC can be used to treat a wide range of contaminants and is identified as the best available technology for several organic chemicals. DDW requires that spent GAC filters undergo an initial testing prior to disposal. Alternately, a bioremediation treatment process allows microscopic organisms already present in the groundwater to consume certain harmful chemicals such as perchlorate. Water is then sent through a traditional water treatment process before it enters the drinking water system. Bioremediation does not require the use of hazardous chemicals and is more cost effective than traditional water treatments.

Note that the environmental effects of increased use of groundwater using existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (*Other Water Management Actions*). This section focuses on the construction impacts of these actions.

Desalination Plants

Desalination facilities of both ocean and brackish water provide a specialized drinking water treatment and represent an alternative source of water for areas with limited groundwater supplies and reduced surface water availability, including both coastal and inland areas. Throughout northern and southern California, water agencies for inland and coastal areas utilize desalination technology to expand water supply.

A typical desalination water project would consist of the following: an intake system (such as a seawater or groundwater pipeline), pretreatment facilities, a desalination facility using pretreatment and reverse osmosis technology, post-treatment facilities, product water storage, on- and off-site landscaping, chemical storage facilities, on- and off-site booster pump stations, and product water transmission pipelines connecting to the existing water conveyance network. Additional design features could include stormwater drainage, noise mitigation, seawater turbidity and quality monitoring, and greenhouse gas (GHG) reduction plans. In addition to producing treated water, desalination would generate a brine stream requiring storage and treatment or disposal.

With respect to specific treatments provided through desalination, the reverse osmosis process is a method of water purification that removes salt and is shown to significantly reduce the total dissolved solids, heavy metals, organic pollutants, viruses, bacteria, and other dissolved contaminants. In the reverse osmosis process, water is put under pressure and passed through semi-permeable membranes. The filtration removes particles and some microorganisms and results in clean, potable water. Reverse osmosis has been used in combination with ultraviolet light and hydrogen peroxide to produce high-quality water that exceeds all state and federal drinking water standards. Other treatments may involve the use of cartridge filtration, decarbonation, and blending and chemical dosing as required; chemicals may include liquid chlorine (sodium hypochlorite) and sodium hydroxide (caustic).

In 2015, the State Water Board adopted an amendment to the *Water Quality Control Plan for the Ocean Waters of California* (Ocean Plan) to address effects associated with construction and operation of seawater desalination facilities (Desalination Amendment). The Desalination Amendment supports the use of ocean water as a reliable supplement to traditional water supplies while protecting marine life and water quality. It provides a uniform, consistent process for regional water boards for permitting of seawater desalination facilities and provides specific implementation, monitoring, and reporting requirements. When considering a new or expanded desalination facility, the regional water board first analyzes a range of feasible alternatives for the best available site, design, technology, and mitigation measures (Wat. Code, § 13142.5 (b)). The regional water board will then consider all four of these factors collectively and determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. In conducting the determination, the regional water board(s) will consult with other state agencies involved in permitting the facility. These agencies include the California Coastal Commission, California State Lands Commission, and California Department of Fish and Wildlife (CDFW). (^SWRCB 2019)

The Desalination Amendment requires seawater desalination plants to use the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. Based on the best available science, the amendment identifies preferred technologies; however, alternative intake and disposal methods can be used if demonstrated to be as protective of marine life as the preferred technologies. Additionally, mitigation measures are required to address harmful impacts on marine life that occur after a desalination facility uses the best available site, design, and technology feasible. Feasibility considerations regarding site, design, technology, and mitigation measures consider economic, environmental, social, and technological factors and whether something is capable of being accomplished in a successful manner within a reasonable period of time. (^SWRCB 2019).

Wastewater Treatment Plants

Municipal wastewater contains sewage, gray water (i.e., water from sinks and showers), and sometimes industrial wastewater. A WWTP is a facility where pollutants are removed through various treatment processes (e.g., physical, chemical, biological) prior to discharge to surface water, ocean, or land. Regulation of waste discharges is discussed in more detail in subsection 7.12.1.2, *Environmental Setting*, of Section 7.12.1, *Surface Water*; and subsection 7.12.2.2, *Environmental Setting*, of Section 7.12.2, *Groundwater*. Wastewater treatment methods, including primary, secondary, and tertiary treatment, are described in detail in Section 7.20, *Utilities and Service Systems.*

Recycled water is wastewater treated by various processes until it reaches an acceptable water quality standard at a WWTP and then is distributed for use. Recycled water can be used to offset potable water used for landscape irrigation; agricultural irrigation; process water for commercial, institutional, and/or industrial uses; and for direct potable use. Water treatment varies according to end use. Direct potable use of recycled water would require that water be treated to drinking water standards.

Water recycling techniques vary based on their intended end use. These techniques include advanced treatments that may include a combination of biological treatment, membrane filtration, and membrane desalination such as reverse osmosis, ozone, and advanced oxidation (American Water Works Association 2016). Water recycling for potable use is currently uncommon but is likely

to increase with increased demand for water. Treatment procedures for potable reuse often include membrane desalination such as reverse osmosis (USEPA 2017). Membrane desalination helps treat water to meet Safe Drinking Water Act requirements, but in the process, it generates a concentrate with elevated concentrations of dissolved constituents such as salt and minerals. Potential concentrate disposal mechanisms include sewer discharge, surface water discharge, irrigation, deep well injection, use of evaporation ponds, or zero liquid discharge thermal processing. If discharge of concentrate to surface water is feasible and becomes the selected method of concentrate disposal, surface water quality would be protected by the requirement to acquire and adhere to an NPDES permit (see subsection 7.12.1.2, *Regulation of Waste Discharges*, in Section 7.12.1, *Surface Water – Environmental Setting*).

It was assumed that modifications or construction to support water recycling would occur within or close to the footprint of an existing WWTP because wastewater recycling needs to be integrated into existing wastewater treatment. It also was assumed that WWTPs are located close to receiving waters (e.g., creeks or rivers) because WWTPs typically discharge treated effluent into receiving waters. Finally, it was assumed that WWTPs are located in urbanized areas adjacent to industrial and urban uses for two reasons: they must be located near existing municipal customers, and they are typically considered public facilities located on lands designated and zoned for public facilities and industrial uses.

The distribution system for recycled wastewater would likely be constructed and operated within existing rights-of-way of roads, below ground adjacent to existing utility lines at depths of 3 to 8 feet. The sites would be returned to preproject conditions after the pipes were installed. It was assumed that the operation of a modified WWTP to produce recycled water would be similar to the existing normal operation conducted by the existing employees at the WWTP.

Modification of a WWTP to add recycled water use could substantially decrease the volume of treated effluent discharged because the effluent would be distributed to recycled water users. The use of recycled water that would otherwise be discharged to a watercourse can affect the availability of water for beneficial uses of water downstream of the discharge point, including instream uses. Water Code section 1211 requires that (1) the owner of any WWTP obtain the approval of the State Water Board before making any change in the point of discharge, place of use, or purpose of use of treated wastewater where changes to the discharge or use of treated wastewater have the potential to decrease the flow in any portion of a watercourse; and (2) the State Water Board review the proposed changes pursuant to the provisions of Water Code section 1700 et seq. To approve a wastewater change petition, the State Water Board must find that the proposed change will not injure other legal users of water, will not unreasonably harm instream uses, and is not contrary to the public interest. To approve the proposed change, the State Water Board must determine that the proposed change will not operate to the injury of any legal user of the water involved (Wat. Code, § 1702).

Note that the environmental effects of increased use of recycled water using existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (*Other Water Management Actions*). This section focusses on the construction impacts of these actions.

7.22.1.4 Other Construction Projects

The resource analyses in Sections 7.3 through 7.20 evaluate environmental impacts that may result from changes in hydrology and changes in water supply and the response actions of water users

using existing infrastructure (e.g., existing groundwater wells, canals, storage facilities.). These resource sections do not include an evaluation of the construction of new projects. In some instances, the analyses conclude that changes in hydrology or changes in water supply could result in actions that involve construction. This section evaluates other construction projects that entities may take in response to changes in hydrology and water supply under the proposed Plan amendments, including new or modified boat ramps, streamflow, or temperature monitoring devices, and water conservation projects such as canal lining—with a focus on the construction impacts of these actions.

Boat Ramps

New or modified recreational boat ramps and associated facilities (e.g., parking area, lighting) may be required in response to changes in reservoir levels. As analyzed in Impact REC-a under *Changes in Hydrology – Reservoir Levels* (see Section 7.18, *Recreation*), some reservoirs could experience periods of lower water elevation relative to baseline conditions, which could result in reservoir boat ramps or docks becoming inaccessible.

Any replacement or modification of ramps would be under the control of individual reservoir operators. Design, as well as construction activities, would depend on multiple variables, such as the type of existing ramp to be modified or the type and size of boats to be launched, and site features (e.g., existing slope, substrate). Options for extending and replacing boat ramps are similar and include installing gravel and/or concrete canvas or cloth[1] (i.e., concrete-impregnated fabric), cast-in-place concrete, or precast concrete slabs. Replacing a boat ramp would require demolishing the existing structure or installing a new ramp leaving the inoperable ramp in place.

Construction activities would depend on the location and type and size of the extension or replacement ramp. These activities could include vegetation clearing or removal for site access and staging; site grading; dewatering for placement of temporary structures (e.g., cofferdam for a cast-in-place ramp); dredging, and placement of riprap, sand, and gravel. Heavy construction equipment (e.g., front loader, dump truck, excavators, cement mixer truck) would likely be required for both replacement or extension of an existing boat ramp. Periodic maintenance for boat ramp extensions and replacement ramps would be required.

Stream Gages and Other Monitoring Devices

New streamflow gages, temperature monitoring, and other monitoring devices may be installed on streams or reservoirs to monitor compliance with the proposed Plan amendments—particularly in locations where such devices currently are not in place. The location, type of gage or other monitoring device, timing of construction, and details of operation would vary depending on site-specific conditions and the compliance monitoring needs of the individual entity.

The design of gages and monitoring devices could range from temporary units with few components to permanent structures of more complex design. Stream gage locations that use a temporary pressure transducer data logger or data logger with telemetry would create minimal stream channel or upland streambank disturbance. If a solar panel is used, minor excavation with hand tools may be needed for the footing of a mounting pole that holds the panel. An example of a permanent device

[1] The options to install only gravel or concrete canvas would be limited to the extension of existing boat ramps.

would be a U.S. Geological Survey (USGS) -rated stilling well style stream gage.[2] Installation of a USGS-rated stream gage would involve stream channel and ground disturbance from work within the stream, as well as vegetation clearing and excavation on the adjacent bank to install features that may include a small concrete pad or other platform to hold equipment, piping, and housing for a sensor and telemetry equipment. Temperature monitoring devices in reservoirs could be expected to involve modifications to existing facilities and may include temperature monitoring cables on dams, installation of floating devices or placement of stationary devices on post-card size plates located out of direct sunlight, or similar minor modifications to existing facilities.

Construction of modified or new stream gages, temperature gages, and other monitoring devices would typically take less than 3 weeks and could involve use of fuel to power pumps, welders, or weed trimmers. Additionally, there could be one to two pickup trucks and a crane on-site that would require fuel and oil, and a portable cement mixer to be used during installation of the stilling well foundation.

Water Conservation Projects

Many water conservation efforts are currently underway and are being implemented in response to recent legislative action and state agency initiatives; reduced Sacramento/Delta water supply under the proposed Plan amendments could accelerate or expand these efforts. Information on water conservation is found in Chapter 6, *Changes in Hydrology and Water Supply* (see subsection 6.6.1.4, *Water Conservation*), and in Chapter 7, *Environmental Analysis (*see subsection 7.1.4.4, *Reasonably Foreseeable Methods of Compliance and Response Actions – Changes in Water Supply – Other Water Management Actions – Water Conservation*). Most actions that could be taken by both agricultural and municipal water users to conserve water are part of normal operations and typically involve only minimal localized earthwork or occur within the normal footprint of agricultural activities. Some conservation measures (e.g., weather forecasting, audits) do not contemplate on-the-ground actions.

Canal lining and canal encasements require construction activities that can vary in size and scope based on the distances of conveyance to be lined or encased and the geographic and geologic settings. Canal lining and encasement projects in California range in size from 1- to 2-mile canal segments to segments stretching over 30 miles. Canal lining activities consist of lining earthen irrigation channels, particularly in locations where soil characteristics result in rapid seepage losses, and their size can range substantially. Lining materials can include concrete or geomembrane materials. Canal encasement projects consist of installation of underground or aboveground pipelines that vary in size, depending on the intended flow capacity, and replace the conveyance abilities of an existing open canal. The pipelines can be installed outside of the existing canal, enabling it to remain functional during construction and avoid the need to install temporary conveyance infrastructure, or within the existing canal trench. Similar to canal lining projects, the new pipeline would be constructed within an existing easement adjacent to the original canal; depending on site conditions, however, additional land may need to be acquired to accommodate the new pipeline. Pipeline materials vary between projects and may include corrugated plastic piping, ductile iron piping, or reinforced concrete piping.

[2] For more information about USGS stilling well stream gages, see: https://www.usgs.gov/media/images/stilling-wells-have-been-used-historically-measure-river-stage.

Construction activities associated with canal lining and encasement could include vegetation clearing for site access, staging, and to prepare the alignment; site grading or excavation; and placement of the lining material. In some cases, lined canals are built parallel to an existing unlined canal so that flow can be maintained during construction. In most instances, the new canal would be constructed within an existing easement adjacent to the original canal; depending on site conditions, additional land may need to be acquired to accommodate the new canal channel. Such projects would require additional excavation and preparation to construct the new canal channel (Imperial Irrigation District 2020). Canal encasement projects may include installation of temporary bypass structures, hauling and placement of the pipelines, and filling of the construction trench.

Note that the environmental effects of increased water conservation with existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (*Other Water Management Actions*). This section focuses on the construction impacts of these actions.

7.22.2 Evaluation of Potential Environmental Impacts

This section provides an evaluation, by resource, of potential environmental impacts related to constructing new or modifying existing faculties to supplement surface water supplies. New or modified facilities could include new or modified dams/reservoirs and points of diversion, new groundwater wells and groundwater storage and recovery projects; new or modified drinking water treatment plants, WWTPs, desalination plants; and other construction projects (new or modified boat ramps, stream gages and other monitoring devices, and water conservation projects). This evaluation includes construction impacts related to these specific types of projects and actions implemented as part of operation and maintenance of these projects, such as chemical transport, handling, and storage, periodic inspections, brine disposal, repairs, and sediment and debris management. A discussion of common construction and operational impacts for all projects is included in the beginning of each resource discussion. The analysis and impact determinations presented in this section reflect the highest level of potential impact. The specific projects that could be undertaken will depend on several factors, such as project size, feasibility, cost, timeline, and expected outcomes. Depending on the specific project, implementation of mitigation measures may or may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and until additional site-specific information becomes available, specific impacts identified and analyzed in this section remain potentially significant. Because the precise location and magnitude of construction and operational activities required are not known, impacts cannot be determined with certainty at this time. Therefore, impacts remain potentially significant.

7.22.2.1 Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. Aesthetics				
Would the project:				
a. Have a substantial adverse effect on a scenic vista	☒	☐	☐	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
c.	Substantially degrade the existing visual character or quality of the site and its surroundings	☒	☐	☐	☐
d.	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	☒	☐	☐	☐

Section 7.3.2, *Environmental Setting*, describes the aesthetic resource setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Depending on the location, construction of new or modified facilities could affect scenic vistas, damage scenic resources viewed from within a state scenic highway, degrade the existing visual quality of an area, or create light or glare. Potential aesthetic impacts from construction activities include ground disturbance, physically damaging scenic resources, introducing large construction equipment to the landscape, removing vegetation or other scenic elements, stockpiling materials (e.g., excavated soil), creating dust, and adding new sources of lighting and glare. Construction activities, equipment and personnel may be temporarily observable when heavy equipment (e.g., excavators, graders, bulldozers) is used for activities such as grading, moving sediment, building structures, and planting vegetation around a project site, particularly if sensitive viewers are located close to the project. Removal of vegetation would also result in temporary visual changes until replacement vegetation is reestablished. During construction, stockpiles may be visible; if the color and form of the stockpiled materials does not blend visually into the surrounding landscape, stockpiles may temporarily substantially degrade the existing visual character or quality of the site and surroundings. While most construction would be expected to occur during daylight hours, it is possible that lighting and/or glare could be associated with projects if the construction schedule required continuous daytime and nighttime work to stay within a specified work window to complete the work. Temporary sources of light could be visible to residents, businesses, and other people in the vicinity. Glare could occur if reflective construction materials were positioned in highly visible locations where sunlight could be reflected.

Long-term aesthetic impacts would depend on the siting and size of the project and preproject and postproject conditions. For example, introducing new buildings or structures to a site could result in permanent changes in the visual landscape components possibly affecting views from the surrounding area or even affecting a larger scenic vista. Projects that include a solar panel and/or operational, security, and safety lighting could also introduce new sources of light and glare.

Aesthetic impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-AES-a–d: A (CMM-AES-a–d). Preproject planning and site design mitigation measures can minimize the effects of such changes by designing projects to minimize ground and vegetation disturbance, preserving vegetation, incorporating fencing or screening of new buildings or structures, using materials and paint colors that blend with the environment, construction sites and shielding or directing construction lights away from sensitive receptors. In addition, as discussed in more detail below,

implementation of Mitigation Measures 7.22 MM-AES-a–d: B and C can avoid or reduce additional potentially significant aesthetic impacts associated with new or modified facilities. If these mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, impacts on aesthetic resources cannot be determined with certainty at this time. Therefore, potential impacts on visual resources remain potentially significant.

Section 7.3, *Aesthetics*, evaluates the operational effects on aesthetics due to increased groundwater pumping and other water management actions, including groundwater storage and recovery, water recycling, water transfers, and agricultural and municipal conservation measures, and presents applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Reservoir and points of diversion projects could significantly affect visual resources during construction (see *Common Construction*). For larger projects, construction would involve a multi-year process with major excavation for the dam footprint, excavation of major aggregate source areas at or near the site, creation of multiple access roads to new facilities for personnel and equipment access, clearing and grading for equipment staging areas, clearing and grading for onsite temporary construction buildings, nighttime lighting for construction safety and security, and cutting all trees that would be in the reservoir inundation zone. Operation of surface water storage facilities may have operational, security, and safety lights that could create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Impacts would depend on the location of sensitive receptors relative to potential lighting.

Reservoir and points of diversion projects could result in significant long-term changes in the visual quality of a site. Depending on the location, projects could alter or damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway. If new facilities were constructed and operated in the portions of rivers designated as a National Wild and Scenic River, impacts could include a substantial change to the visual character and quality of the surrounding area from natural river canyon scenery to a placid lake. On-stream reservoirs could flood land and convert a natural river canyon scenery to a lake. Off-stream reservoirs could flood farmland or other land cover types with scenic qualities, although views of open water could be considered beneficial. Reservoirs could also include facilities such as chemical storage tanks and pump equipment, buildings, pump houses, spillways, pipelines, power generation facilities, transmission lines, new service roads, and cleared access areas that affect scenic and visual quality. Modification of existing facilities would be less likely than new facilities to result in negative visual impacts because the facilities would be located near similar existing infrastructure.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-AES-a–d: B could reduce impacts on visual resources associated with reservoir and points of diversion projects. Larger projects would require extensive feasibility studies to determine suitable locations and project planning provides opportunities for aesthetic design when determining structural elements and other project features. Until mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery

Groundwater well installation and groundwater storage and recovery projects may result in temporary visual effects on scenic vistas and the existing visual character primarily during construction due to the short-term introduction of heavy construction equipment and dust (see *Common Construction*).

Long-term conditions at a new groundwater well installation site would vary depending on the type of well (i.e., agricultural, municipal, domestic), the number of new wells, and whether other related components are included at the site. For some installations, there would be little or no long-term effects on visual resources because the groundwater wells and related infrastructure, including the water distribution piping, would be underground or low to the ground. These features would not interfere with a scenic vista or damage scenic resources within a state scenic highway. Within agricultural areas, the presence of aboveground groundwater well infrastructure (e.g., pumps, distribution pipes, monitoring equipment) would be consistent with the use of the land and would not degrade the visual character or quality of the site or surroundings. A new municipal groundwater well field may include a small building to house aboveground pumping, treatment, and monitoring systems and one or more water holding tanks. Typically, municipal groundwater wells and related infrastructure or buildings would be surrounded by security fencing that would prevent direct views of the facilities. New municipal wells could introduce an industrial (public works) facility into a residential setting and may add new sources of light to a site.

Passive recharge projects would use existing infrastructure and would not change the visual character of the area. Active groundwater recharge would require construction and operation of injection wells, which would be relatively small and unobtrusive, and municipalities may convert existing extraction wells so that they are able to both inject and extract water; the associated pipelines would likely be located underground.

In many locations, a new well installation would not result in any long-term substantial adverse change of a scenic vista, damage scenic resources viewed from within a state scenic highway, degrade the existing visual quality of an area, or create light or glare impacts. New municipal groundwater wells are generally low to the ground, may be contained within a small structure to protect aboveground piping infrastructure, and would likely be fenced for security, which could prevent direct views. In some locations, however, the presence of new municipal groundwater wells and related structures could change the visual quality or character of an urban or suburban area and introduce new sources of light or glare. These impacts would be potentially significant. Implementation of project siting and design criteria and light and glare measures under Mitigation Measure 7.22 MM-AES-a–d: A (CMM-AES-a–d) and project siting and design measures under Mitigation Measures 7.22 MM-AES-a–d: C2 and C3 could avoid or reduce aesthetic impacts associated with these actions. Until mitigation measures are implemented, the impacts remain potentially significant.

Water Treatment Facilities

Water treatment facilities, including desalination facilities, could affect visual resources due to siting and during construction (see *Common Construction*). Installation of water treatment facilities would introduce new or expanded built facilities to an area; these structures could affect scenic and visual quality, particularly if located in or near a residential area. Water treatment facilities may include appurtenant buildings and industrial infrastructure (e.g., holding tanks, groundwater wells, other

plain concrete and/or steel structures) and outside areas for chemical storage tanks, for example, that could add an overall unaesthetic appearance. Facilities include permanent infrastructure needed to convey water to the water treatment facility and to move waste from the facility to its destination. Modified facilities, including water recycling treatment plants, would be less likely to have impacts on scenic and visual quality because these facilities would be located adjacent to existing infrastructure and/or within existing facilities. In addition, because of the need for sufficient land to support the operations of these facilities, including treatment ponds, these facilities are typically located some distance from residences, scenic roads, and recreational areas.

The long-term potential aesthetic impacts of desalination facilities are similar to those for other water treatment facilities. These potential impacts include visual impacts on scenic vistas from siting and construction activities related to installation of intake and outfall structures, as well as permanent infrastructure needed to move source water to the facility and to transfer waste from the facility to the outfall. Well intakes and other infrastructure could be constructed above grade and fenced for security. This could affect visual resources if located in a visually sensitive area. Although desalination facilities are typically located near the coast in order to provide ready access to water and for the disposal of brine in the ocean, they are not generally located in scenic areas because undeveloped coastal land with scenic value is expensive and the coast is subject to the limits on activities found in the Coastal Act and subject to strict review by the California Coastal Commission. Larger projects would require extensive feasibility studies to determine suitable locations, and project planning provides opportunities for aesthetic design when determining structural elements and other project features.

These impacts would be potentially significant. Implementation of project siting and design criteria under Mitigation Measure 7.22 MM-AES-a–d: A (CMM-AES-a–d) could reduce impacts on visual resources. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-AES-a–d: C, which incorporates aesthetic design in any postconstruction features, could reduce impacts on visual resources associated with water treatment facilities, including desalination facilities. Until mitigation measures are implemented, the impacts remain potentially significant.

Modified water treatment facilities, including water recycling treatment plants, would be less likely to have impacts on the visual character or quality of an area because these facilities would be located adjacent to existing infrastructure and/or within existing facilities. In addition, because of the need for sufficient land to support the operations of these facilities, including treatment ponds, these facilities are typically located some distance from residences, scenic roads, and recreational areas. New drinking water treatment plants that include groundwater wells could result in impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*).

Other Construction Projects

Other construction projects could significantly affect visual resources primarily during construction, depending on the size and location of the action. These projects would have short-term localized effects on visual resources associated with use of a small number of heavy equipment, use of staging area(s), storage of equipment and materials, and possible vegetation disturbance or removal (see *Common Construction*).

Overall, the presence of new or modified boat ramps and new stream gages would be compatible with other surrounding uses and views and in some locations would be an extension of an existing

facility. It is expected that, in most locations, these types of projects would not result in any substantial adverse change of a scenic vista, damage scenic resources viewed from within a state scenic highway, degrade the existing visual quality of an area, or create light or glare impacts.

Depending on its size, canal lining or encasement projects could result in permanent significant landscape-level changes to the visual environment that could affect visual resources, particularly if the alignment is altered or a canal is converted into a pipeline conveyance (encasement). Once construction is complete, new expanses of unvegetated views may be associated with placement of concrete or other canal lining materials, or the location of a new pipeline (either aboveground or partially buried underground). In areas that are revegetated, it could take time for newly planted vegetation to reach maturity. Mitigation Measure 7.22 MM-AES-a–d: A (CMM-AES-a–d) includes project siting and design criteria that would reduce or avoid visual impacts. Until mitigation measures are implemented, the impacts remain potentially significant.

Mitigation Measures

7.22 MM-AES-a–d: Mitigate impacts on visual resources

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction AES Mitigation Measures (CMM-AES-a–d)

1. **Project Siting and Design:** Design the site or facilities to blend with surrounding land uses. Design will comply with applicable local plans (e.g., city/county general plans) and ordinances, as well as with applicable resource management plans for projects on public land.

   Design-related measures to reduce impacts on visual resources could include the following.

   i. Develop design form and materials to achieve aesthetic visual character instead of a strictly utilitarian objective. Use cast natural form elements or natural materials for facing to create texture and color compatible with the adjacent landscape.

   ii. Retain the existing topographic features, to the extent feasible, to lessen the degree of visual impact.

   iii. Avoid or minimize the removal of trees, shrubs, and other mature vegetation.

   iv. Design grading to blend with surrounding landforms.

   v. Minimize the vertical profile of proposed structures. Use landscaped berms instead of walls to mask views of structures from high-visibility sites.

   vi. Install any infrastructure (e.g., transmission lines) underground in areas with high visibility and high public use, to the extent feasible.

   vii. Use compatible colors for proposed structural features. Use earth tone paints and stains with low levels of reflectivity.

   viii. Implement revegetation and landscaping that includes landscape planting and restoration of areas that were disturbed by construction activities to enhance the appearance of the new facilities or to screen negative visual elements. Specific requirements include replacement of scenic resources, including revegetation, tree

planting (particularly if trees were removed), and installation of new native landscaping to enhance the appearance of the new facilities or to screen negative visual elements.

ix. For projects that involve any new or relocated roads, develop aesthetically pleasing landscaping for new/relocated roads at the shoulders, intersections, and on- and off-ramps from highways. Design turnouts and scenic vista points where appropriate with high visibility and high public use.

2. **Screen Construction Areas:** Screen construction areas from public view.

3. **Spoil Disposal Areas:** Round the tops and bottoms of spoil disposal areas and contour the faces of slopes to create more natural-looking landforms. Create visual diversity by planting vegetation with diverse growth forms on the spoil disposal areas. Vegetation will not be limited to grasses.

4. **Dust Control Measures** (CMM-AQ-a–e: 3)

5. **Waste Management and Material Control Measures** (CMM-WQ-a–j: 4)

6. **Light and Glare Minimization:** Minimize new sources of substantial light or glare that would adversely affect day or nighttime views in the area:

   i. Limit construction activities to daylight hours, to the extent feasible.

   ii. When construction lighting is required, direct lighting away from residential and roadway areas where sensitive receptors may be present. Use shields for lighting and direct lighting downward and inward toward the construction site.

   iii. Where lighting may be required for site security, use automatic motion-sensor lighting to reduce light emissions.

   iv. Use construction equipment and temporary, construction-related facilities with low levels of reflectivity.

   v. Permanent lighting will be downcast, cut-off type fixtures with non-glare finishes and controlled by photocells and motion sensors, depending on the location. Lighting will be of minimum intensity with adequate strength for security, safety, and access.

   vi. Follow applicable county and local jurisdiction lighting guidelines and requirements relevant to the proposed project site or area, which may include, ensuring that project design incorporates outdoor lighting configurations and operational practices that minimize creation of obtrusive misdirected, excessive, or unnecessary lighting and reduce potential for light pollution.

7. **Construction BIO Mitigation Measures: Avoid Vegetation Disturbance** (CMM-BIO-a–f: 9), **Revegetation Plan** (CMM-BIO-a–f: 11) and **Revegetation Monitoring and Reporting** (CMM-BIO-a–f: 12)

B. Reservoirs and Points of Diversion AES Mitigation Measures

1. **Project Planning**: Preproject planning for new or modified reservoirs and points of diversion projects will include consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility.

2. **Project Siting**: Locate projects to avoid or minimize changes to the visual character and quality of the surrounding area. Avoid siting projects on or near rivers designated as a National Wild and Scenic River.
3. **Project Design**: Consider opportunities for aesthetic design when determining structural elements and other project features. Incorporate aesthetic design in any post construction features.

C. Water Treatment Facilities AES Mitigation Measures

1. **Project Planning:** Preproject planning for water treatment facilities (including desalination plants) will include consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility.
2. **Project Siting:** Locate projects to avoid or minimize changes to the visual character and quality of the surrounding area.
3. **Project Design:** Consider opportunities for aesthetic design when determining structural elements and other project features. Incorporate aesthetic design in any postconstruction features.
    i. For applicable desalination facilities, ensure that project complies with the California Coastal Act, including consistency with relevant local coastal program and review and approval by the California Coastal Commission, if applicable.
    ii. Buildings should match the buildings in the surrounding neighborhood both architecturally and in materials selection.
    iii. Fencing should be made of wrought iron or other suitable material compatible with the surrounding community.
    iv. Structures should be offset, rotated, and separated to provide a more open appearance. If possible, avoid industrial look where structures are laid out in straight lines and pushed together.
    v. Build infrastructure below grade and bury pipelines and other infrastructure where possible.
    vi. Apply landscaping, including trees and natural vegetation, to enhance the appearance of the treatment facility and neighborhood. Avoid removal of mature vegetation to the extent that it would aid in screening the treatment facilities, including outside storage areas.
    vii. Screen from view on all sides visible to the public exterior mechanical equipment and other facilities (e.g., tanks, heating, air conditioning, refrigeration equipment, plumbing lines, duct work and transformers, chemical storage tanks). The design and material used for screening will be architecturally compatible with the building.
    viii. Lighting should be soft and must not produce glare. Light should point downward, not outward. Use bollards with lights along walkways about 3 feet in height.

7.22.2.2 Agriculture and Forest Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
II. Agriculture and Forest Resources				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Boards.				
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use	☒	☐	☐	☐
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract	☒	☐	☐	☐
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526) or timberland zoned Timberland Production (as defined by Government Code section 51104(g))	☒	☐	☐	☐
d. Result in the loss of forest land or conversion of forest land to non-forest use	☒	☐	☐	☐
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use	☒	☐	☐	☐

Section 7.4.2, *Environmental Setting*, describes the agricultural and forest resources setting and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

New or modified facilities would affect agricultural and forest resources through the siting and construction of the project. Depending on the location of the project site, projects could result in temporary or permanent conversion of important farmland (i.e., Prime Farmland, Unique Farmland, Farmland of Statewide Importance) to nonagricultural use, conflict with existing zoning for agricultural use or a Williamson Act (Gov. Code, § 51200 et seq.) contract, or result in the loss or conversion of forest land. Temporary impacts from construction activities could include removal of vegetation and/or topsoil; introduction of invasive weeds; restricting access to or interfering with use of agricultural land; disturbance of utilities and infrastructure that serve agriculture; disturbance of soil in development footprints, borrow/spoils areas, or staging areas (e.g., soil compaction resulting from heavy equipment storage or soil stockpiling); and dust generation. In areas where agricultural or forested areas are cleared for buildings and other facilities, roads, and other project features, these types of temporary effects could become permanent and could result in the direct permanent conversion of important farmland, conflicts with agricultural zoning or Williamson Act-contracted land, loss or conversion of forest land, or conflicts with existing zoning for forest land or timberland. If facilities such as roads are sited on agricultural land such that these facilities create unusable remnant parcels of agricultural land, indirect permanent conversion of land to nonagricultural use could also occur. Depending on project location, construction activities have the potential to cause permanent ground disturbance and affect ongoing agricultural activities. Construction activities could also result in impacts that indirectly affect adjacent agricultural and forest land through loss of soil due to erosion.

Agricultural and forest resource impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-AG-a–e: A (CMM-AG-a–e). Mitigation can include designing projects to avoid or minimize impacts on important farmland or forest land, agricultural soil protection measures, and paying the appropriate agricultural mitigation fee or purchasing a conservation easement on agricultural land pursuant to county or local jurisdiction requirements. If mitigation measures are implemented, many impacts can be mitigated to less than significant. Because the precise location and magnitude of construction activities required for new or modified facilities are not known, impacts on agriculture and forest resources cannot be determined with certainty at this time. Therefore, potential impacts on agriculture and forest resources remain potentially significant.

Section 7.4, *Agriculture and Forest Resources,* evaluates the operational effects on agriculture and forest resources due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water recycling, water transfers, and agricultural and municipal conservation measures, and presents applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

New or modified reservoirs and points of diversion could be used to support the continued use of agricultural land by supplying irrigation water, and to make water delivery more accessible and efficient in response to reduced surface water supply which would benefit agriculture. Implementation of new or modified off-stream or on-stream reservoirs or points of diversion could result in the conversion of important farmland and/or forest land, conflict with existing zoning for agricultural use or a Williamson Act contract due to construction (see *Common Construction*). As described above, construction activities could cause direct or indirect temporary or permanent

disturbance to agricultural lands. Construction could indirectly disrupt agricultural lands and activities through disruption of irrigation systems; soil compaction, which could affect drainage; and dust generation as a result of ground-disturbing activities, which could temporarily affect crop growth on adjacent agricultural parcels. In addition, filling a new reservoir or expanding an existing reservoir footprint could permanently convert important farmland or forest land, conflict with agricultural zoning or Williamson Act-contracted land, or conflict with existing zoning for forest land or timberland if the reservoir was sited in whole or part on these land types. In areas where agricultural or forested areas are cleared for buildings and other facilities (e.g., power supply facilities), roads, and other project features, these types of temporary effects could become permanent and could result in the direct permanent conversion of important farmland, conflicts with agricultural zoning or Williamson Act contracted land, loss or conversion of forest land, or conflicts with existing zoning for forest land or timberland. New or modified points of diversion could also convert farmland to nonagricultural uses for diversion facilities, but this conversion would be at a much smaller scale than reservoir projects. New or modified reservoirs or points of diversion could also be proposed on land protected under the Williamson Act or Farmland Security Zone contracts, which could involve taking of protected land through eminent domain. New or modified off-stream or on-stream reservoirs or points of diversion could cause a conversion of forest land in much the same way as agricultural land. Dams could cause inundation of forest land and points of diversion could convert forest land for diversion facilities. These impacts would be potentially significant. Mitigation Measure 7.22 MM-AG-a–e: A (CMM-AG-a–e) includes project siting and design criteria, postconstruction BMPs, agricultural soil protection measures, and payment of appropriate agricultural mitigation fees or purchase of a conservation easement on agricultural land pursuant to county or local jurisdiction requirements, which would reduce or avoid impacts on agriculture and forest resources. Until mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery

Installation of new agricultural groundwater wells and construction associated with groundwater storage and recovery projects could adversely affect agriculture and forest resources primarily due to construction (see *Common Construction*). It is expected that new agricultural groundwater wells would be situated on land zoned for agriculture and not on forestland. The groundwater wells would be expected to occupy less than 0.25 acre per well; therefore, they would not substantially reduce the area available for crop production. New municipal groundwater wells would not be expected to be located on lands used for agriculture or on zoned forestland but rather would be sited close to the urban and suburban uses that they supply and in proximity to existing water supply infrastructure. Active groundwater recharge facilities would be relatively small and unobtrusive, and municipalities may convert existing extraction wells so that they are able to both inject and extract water. Injection groundwater storage and recovery would not be expected to have long-term impacts on agricultural or forestland because injection wells would likely be located on municipal properties.

Passive groundwater storage involves adding water to canals or flooding agricultural lands (potentially including important farmland) in winter. For the most part, using agricultural lands for groundwater recharge during winter would not modify their agricultural purpose during the irrigation season (generally April–September). Additionally, groundwater recharge would support agricultural use because stored water could be pumped from the aquifer to irrigate agricultural fields. Farmers may choose to set aside a number of acres specifically for recharge if they determine

that a portion of their property is particularly well-drained and therefore especially suitable for groundwater recharge. This would allow for a longer recharge season in wet years because the acreage would not be planted. The acreage would benefit local agriculture because the water would later be used for irrigation. Fields used for row crops are typically well suited to recharge because the fields are bare during the recharge season. Perennial crops, such as fruits and nuts, could be damaged if groundwater recharge causes root rot in orchards; however, farmers are likely to take care that such damage does not occur. If crops were damaged in this manner, fields would likely be returned to agricultural use and not converted. Passive groundwater storage and recovery would not occur on forest land.

Water Treatment Facilities

New water treatment facilities, including desalination plants, and associated infrastructure could adversely affect agriculture and forest resources primarily due to siting and construction (see *Common Construction*). New or modified water treatment facilities and water recycling facilities are operated to supply clean drinking water and recycled water, respectively, and thus generally do not affect land use. In addition, water recycling facilities may indirectly benefit agriculture by partially replacing surface water diversions for agricultural irrigation. Modification of existing facilities would be unlikely to result in long-term impacts if modifications are made within the existing facility footprint. In addition, water treatment facilities are typically located in more urbanized areas away from agricultural and forest land. Depending on the project location, however, it is possible that water treatment facilities could cause the conversion of important farmland. Construction of water treatment facilities and associated infrastructure could convert farmland to nonagricultural uses for facilities. Construction of water treatment facilities could also be proposed on land protected under the Williamson Act or Farmland Security Zone contracts, which could involve taking of protected land through eminent domain. Construction of water treatment facilities could also result in conversion of forest land.

These impacts would be potentially significant. Mitigation Measure 7.22 MM-AG-a–e: A (CMM-AG-a–e) includes project siting and design criteria, payment of appropriate agricultural mitigation fees or purchase of a conservation easement on agricultural land pursuant to county or local jurisdiction requirements, postconstruction BMPs, and agricultural soil protection measures; these measures would reduce or avoid impacts on agriculture and forest resources. Until mitigation measures are implemented, the impacts remain potentially significant.

Other Construction Projects

Boat ramps, stream gages, and canal lining activities could result in temporary construction impacts on agriculture and forest resources from use of heavy equipment and vegetation removal (see *Common Construction*).

Canal lining activities would likely occur on agricultural land (including important farmland) because lining would be implemented on existing earthen irrigation channels. Where new lined irrigation canals are constructed, both temporary and permanent impacts on agricultural resources would occur due to construction and siting. Similarly, canal encasement projects, which consist of installation of underground or aboveground pipelines, would primarily result in impacts on agricultural resources (land conversion and zoning conflicts) due to siting and construction. Land could be returned to agricultural use once the pipelines are completed. These impacts would be potentially significant. Mitigation Measure 7.22 MM-AG-a–e: A (CMM-AG-a–e) includes project siting

and design criteria, postconstruction BMPs, and agricultural soil protection measures, which would reduce or avoid impacts related to agriculture and forest resources. Until mitigation measures are implemented, the impacts remain potentially significant.

Mitigation Measures

7.22 MM-AG-a–e: Mitigate impacts on agriculture and forest resources

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction AG Mitigation Measures (CMM-AG-a–e)

1. **Project Siting and Design:** Design and site projects to avoid or minimize impacts on farmland.
    i. Design project to avoid or minimize construction-related impacts on agriculture, particularly Prime Farmland, Unique Farmland and Farmland of Statewide Importance.
    ii. Establish buffer areas between project construction zones and adjacent agricultural land that are sufficient to protect and maintain land capability and agricultural operation flexibility.
    iii. Redesign project features to minimize fragmenting or isolating Farmland. Where a project involves acquiring land or easements, ensure that the remaining nonproject area is of a size sufficient to allow economically viable farming operations.
    iv. Site and/or design project to avoid land protected by agricultural zoning or a Williamson Act contract. Project proponents will take into account agricultural value when selecting a project site, preferring unprotected sites to protected sites and lower value sites (as quantified by the California Agricultural Land Evaluation and Site Assessment (LESA) model to higher value and Williamson Act–protected lands.
2. **Invasive Species Control Measures:** Manage project construction activities to minimize the introduction of invasive species or weeds that may affect agricultural production on adjacent agricultural land. (See also CMM-BIO-a-f: 8.)
3. **Postconstruction Best Management Practices:** Following the completion of construction activities on agricultural land, implement postconstruction best management practices to return the land to preproject conditions. These measures may include, but not necessarily be limited to the following.
    i. Reconnect utilities or infrastructure that serve agriculture uses, as necessary, if these facilities are disturbed by project construction. If a project temporarily or permanently cuts off roadway access or removes utility lines, irrigation features, or other infrastructure, the project proponents will be responsible for restoring access as necessary to ensure that economically viable farming operations are not interrupted.
    ii. Where underground infrastructure has been installed as part of the project, backfill to preproject contours to allow agricultural use to resume.

4. **Protect Agricultural Soils:** To protect agricultural soils the following BMPs will be implemented.
    i. Protect exposed agricultural soils with mulches, geotextiles, and vegetative ground covers during and after project construction to minimize soil loss.
    ii. Depending on the thickness of the topsoil, topsoil may be salvaged from construction work areas, stockpiled, and then applied over the surface of spoil and borrow areas, or other areas temporarily disturbed during construction (e.g., due to trenching) to the maximum extent practicable.
    iii. For staging areas and similar areas in which topsoil will not be excavated or overcovered, the soil will be decompacted or otherwise remediated after demobilization.
5. **Agricultural Mitigation Consistent with County and Local Jurisdiction Requirements:** To offset the conversion of agricultural land to nonagricultural uses, comply with applicable county and local jurisdiction requirements, which may include, for example, purchase of a conservation easement on agricultural land at least equal to the number of acres converted to nonagricultural use (1:1 ratio), or the payment of the appropriate agricultural mitigation fee for converted acreages of agricultural land.
6. **Avoid or Minimize Impacts on Forest and Timberland:**
    i. Design the construction plan to avoid or minimize construction-related impacts on lands zoned for timber production and on forest land. Where construction occurs on or near forest land, avoid and preserve onsite trees.
    ii. Restrict ground-disturbing mechanical operations around forest land and timber land.
    iii. Develop and implement a reforestation plan in the event that forest land conversion cannot be avoided during construction. Preserve in perpetuity other forest land through a conservation easement or by acquiring lands or contributing funds to a land trust or other agency (at a ratio of 1:1 to compensate for permanent loss). If there is an existing forest land mitigation program for construction-related impacts on forest land, comply with that program to the extent required by law.
    iv. If applicable, obtain and comply with timberland conversion permit from the California Department of Forestry and Fire Protection (CAL FIRE).

7.22.2.3 Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
III. Air Quality				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan	☒	☐	☐	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation	☒	☐	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)	☒	☐	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations	☒	☐	☐	☐
e. Create objectionable odors affecting a substantial number of people	☒	☐	☐	☐

Section 7.5.2, *Environmental Setting*, describes the air quality conditions and relevant regulatory setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

New or modified facilities could affect air quality through construction actions that generate fugitive dust as well as emissions from fuel combustion in heavy equipment. Construction activities have the potential to generate pollutant emissions such as localized carbon monoxide, particulate matter (including fugitive dust), and diesel particulate matter from heavy equipment, diesel-powered vehicles, construction equipment with internal combustion engines, and diesel-powered pumps used during construction activities. New or modified facilities could exceed criteria pollutant threshold levels threshold levels during construction from the use of heavy equipment and trucks, and the construction of offsite pipeline distribution systems could result in increased pollutant emissions from construction-related truck trips.

Exhaust emissions could be generated by construction equipment and vehicles traveling to and from a project site. Fugitive dust may also be generated by earthmoving during construction or by traveling on unpaved roads. If dredging activities require a large number of truck trips for transport of dredged sediments, for either reuse or disposal, those truck trips could generate emissions that result in impacts on air quality.

Emissions associated with construction activities could conflict with or obstruct implementation of the applicable air quality plan, violate air quality standards, or contribute substantially to an existing or projected air quality violation, result in a cumulatively considerable net increase of any criteria pollutant, and expose sensitive receptors to substantial pollutant concentrations. Exposure of sensitive receptors (e.g., residences, hospitals, schools) to air pollutants and fugitive dust emissions from ground disturbance could occur during temporary construction activities. Construction activity that includes blasting can generate substantial particulate emissions due to fugitive dust.

Construction activities can inadvertently disperse contaminants into the environment. In areas where *Coccidioides* spp. Fungus (responsible for Valley fever) is endemic, disturbance of soils containing *Coccidioides* spores may expose workers and people adjacent to the construction site to these fungal spores in fugitive dust. Asbestos may be found in existing structures that were built with asbestos-containing products (e.g., insulation, flooring materials, cement). Asbestos also occurs naturally in certain rock types (e.g., serpentinites) or soil (^ATSDR 2015). Inhalation of airborne asbestos fibers is the primary way that people are exposed, and this can result in serious respiratory health issues. Accordingly, demolition of existing structures, substantial disturbance of asbestos-containing soil, or crushing asbestos-containing rock during construction could adversely affect construction workers or others in the vicinity of the construction activity.

Air quality impacts from common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-AQ-a–e: A (CMM-AQ-a–e). Mitigation can include compliance with local air district rules and regulations and established thresholds, using equipment and vehicles that are compliant with the California Air Resources Board (CARB) requirements and emissions standards for on-road and off-road fleets and engines, using electric equipment when feasible, and complying with all applicable CARB regulations and standards. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-AQ-a–e: B–C can avoid or reduce potentially significant air quality impacts from new or modified facilities. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, air quality impacts cannot be determined with certainty at this time. Therefore, potential impacts on air quality remain potentially significant.

Construction activities generally do not create objectionable odors affecting a substantial number of people. Odors may be generated during construction through exhaust emissions from diesel equipment, for example, or from project-specific activities such as laying asphalt as part of road construction or extraction of drilling mud in well development. However, construction-related emissions from equipment would be localized, temporary, and intermittent over the course of construction. Generally, construction-related odors would be temporary and would likely dissipate from the source relatively rapidly.

Operation and maintenance of new or modified facilities would vary depending on the facility type but may include equipment operation (pumps, generators) and occasional vehicular trips for periodic inspections, monitoring, and evaluation, including operation of maintenance equipment and trucks on unpaved roads. Operation and maintenance of modified facilities would likely add few to no staff and require limited or no additional worker or delivery vehicle trips. Operations emissions would be substantially lower than construction emissions. Except for recreation associated with reservoirs (see *Reservoirs and Points of Diversion*), emissions from new and modified facilities operations would not be expected to prevent compliance with regulations or exceed

thresholds established by the local air quality district, conflict with or obstruct implementation of the applicable air quality plan, violate any air quality standard or contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase of any criteria pollutant—given the limited number of vehicle trips over time. New or modified facilities could require power for operations and maintenance, such as for lighting at facilities and operating pumps and other equipment. This power would be supplied by facilities that currently provide power or potentially by solar power (i.e., stream gage telemetry). Existing power facilities operate under permits that provide for meeting current emission standards by limiting emissions and/or offsetting emissions by using pollution credit.

Section 7.5, *Air Quality*, evaluates the operational effects on air quality due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water recycling, water transfers, and agricultural and municipal conservation measures, and presents applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Reservoir and points of diversion projects can range from small projects (e.g., simple relocation of an existing diversion structure) to large projects (e.g., constructing a new dam and reservoir). The impacts on air quality associated with these projects are related to the size of the project as well as the magnitude and duration of construction. Depending on the type and size of the project, construction activities could take place over several years and would include major excavation activities, particularly for the dam and inundation footprint for new reservoirs, as well as tunneling, trenching, surface water and groundwater dewatering, quarrying, potentially demolition, and other activities. Many of the associated construction impacts for small reservoir and diversion projects can be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

Construction of larger dam and diversion projects could result in substantial particulate emissions due to fugitive dust generated from blasting activities and from removal and placement of excavated materials (cut-and-fill activities). Depending on the volume of rubble and excavated material (soil spoils) hauled away from a project site, fugitive dust also could be spread offsite via haul trucks. These impacts would be potentially significant. As with other construction activities, blasting equipment and activities must comply with local air district regulations.

A new reservoir may also include associated recreational facilities (e.g., marinas, campgrounds, general-purpose stores), the operation of which could result in generation of emissions from vehicle trips of recreationists and employees. However, depending on the location of a new reservoir relative to larger population centers, there could be a net decrease in vehicle miles traveled, and therefore emissions. If the new reservoir was relatively close to a large population center, recreationists' trips to the new reservoir may replace trips to other popular recreation destinations that are farther away. Consequently, criteria pollutants would likely decrease in some areas and increase in the area of the new reservoir. Similarly, motorized boating and Jet Ski use at a new reservoir that allows these types of recreational activities would likely result in a decrease in boating activity and, thus, emissions, at other nearby reservoirs, and an increase at the new reservoir. Regardless, vehicle and boat emissions at a new reservoir could result in a cumulatively considerable net increase in criteria pollutants for which the project region is designated nonattainment under an applicable federal or state ambient air quality standard.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-AQ-a–e: B would minimize or avoid impacts on air quality by requiring site-specific dust control at new or modified reservoirs or points of diversion.

Operation of new or modified reservoirs generally would result in minimal long-term air quality pollutant emissions. Any associated facilities would use power from hydropower generation rather than an emissions source. Also, power facilities needed for the additional energy demand from operating new or modified reservoirs and points of diversion facilities are already built and permitted by the applicable local air district to emit a maximum amount of criteria pollutants.

As part of normal operations, the reservoir may be drawn down, lowering water levels and thereby exposing reservoir soils to wind events at certain times of the year and in drier water-year types. Soil conditions in reservoirs are typically heavier sediments such as silt and clay. In spring and early summer, this exposed soil would also have a higher moisture content following spring snowmelt and rains. Accordingly, these conditions would limit the potential for dispersion during drawdown and wind events. In addition, if harmful algal blooms (HABs) develop in new reservoirs (refer to Section 7.22.2.9, *Hydrology and Water Quality*), as the blooms die and decay they can produce an odor. Any HABs-associated odors would dissipate as a function of distance and are not anticipated to affect a substantial number of people (i.e., result in more than five odor complaints per year averaged over 5 years), particularly as recreationists could relocate to another part of the reservoir unaffected by HABs. These potential air quality impacts would be less than significant.

Groundwater Wells and Groundwater Storage and Recovery

Groundwater well development and groundwater storage and recovery projects could affect air quality during construction due to operation of heavy construction equipment, vehicle trips, and dust (see *Common Construction*). The long-term effects on air quality from increased groundwater pumping, including at groundwater storage and recovery facilities, are evaluated in Section 7.5, *Air Quality*. As discussed in Section 7.5, operation of agricultural and municipal groundwater wells that use gasoline or diesel pumps would generate exhaust-related pollutant emissions. Applicable mitigation measures to minimize or avoid these effects are also discussed in Section 7.5, *Air Quality*.

Water Treatment Facilities

Construction of new or modified water treatment facilities would result in emissions associated with construction equipment and construction worker vehicle trips, as well as fugitive dust emissions from ground disturbance (see *Common Construction*).

Section 7.5, *Air Quality*, evaluates the operational effects on air quality due to increased use of groundwater pumping (as might occur if groundwater were used as a water source for new drinking water treatment plants), and increased use of recycled water, and presents any applicable mitigation measures that could minimize or avoid these impacts.

The desalination process is energy intensive. The need for additional energy could result in increased criteria pollutant emissions at power generation facilities. However, the power facilities that would compensate for the additional demand are already built and permitted by the applicable local air district to emit a maximum amount of criteria pollutants. As part of the permitting process, these power facilities are required to offset additional power generation by the use of emission reduction credits as required by applicable local air district New Source Review programs.

Therefore, if additional emissions are generated, they would be generated by regulated power facilities. In addition, because energy is a major cost of desalination, the economic viability of desalination facilities depends on energy efficiency and the availability of low-cost power, which is typically generated using renewable power sources (Section 7.22.2.6, *Energy and Greenhouse Gas Emissions*). Both energy efficiency and use of renewable energy reduce power-generation emissions. Accordingly, impacts on air quality due to operation of a desalination facility would be less than significant.

Power facilities needed for the additional demand from water treatment plants and recycled water facilities are already built and permitted by the applicable local air district to emit a maximum amount of criteria pollutants.

WWTPs, including those with water recycling facilities, are known sources of odors. If new WWTPs are constructed, they could result in new odor sources, which would result in a potentially significant impact. Water recycling facilities would likely be associated with already existing WWTPs and would not generate additional odors beyond levels of the existing WWTP. WWTPs can implement odor control measures to reduce the potential for odor-related impacts resulting from operation. Mitigation Measure 7.22 MM-AQ-a–e: C can avoid or reduce potentially significant air quality impacts associated with odors through development and implementation of an odor management plan. Implementation of Mitigation Measure 7.22 MM-WQ-a–j: D1 would ensure regulatory compliance with the State Water Board's General Order for Water Reclamation Requirements for Recycled Water Use that contains conditions, including maintaining dissolved oxygen in the wastewater, to minimize and eliminate odors. Until mitigation measures are implemented, this impact remains potentially significant.

New drinking water treatment plants that include groundwater wells could result in air quality impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*).

Other Construction Projects

Air quality impacts would be associated with construction activities for new or modified boat ramps, stream gages and other monitoring devices, and water conservation projects requiring construction activities that result in ground disturbance (e.g., canal lining). Impacts can be mitigated through implementation of construction mitigation measures (see *Common Construction*). Once constructed, these projects would not violate air quality standards or cause odors because these structures would not result in emissions or odors during operation.

Mitigation Measures

7.22 MM-AQ-a–e: Mitigate impacts on air quality

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction AQ Mitigation Measures (CMM-AQ-a–e)

1. **Regulatory Compliance:**

    i. Comply with all applicable CARB regulations and standards.

ii. Adhere to all applicable air district rules and regulations with jurisdiction in the project area.

iii. Comply with all applicable general plan policies and ordinances relating to air quality.

2. **Emission Reduction Measures:**

i. Locate staging areas at least 1,000 feet away from sensitive receptors.

ii. Minimize idling time from both on-road and off-road diesel-powered equipment either by shutting equipment off when not in use or reducing the time of idling to 5 minutes (Cal. Code Regs, tit. 13, §2485). Provide clear signage that posts this requirement for workers at the entrances to the site.

iii. Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.

iv. Use equipment and vehicles that comply with the CARB requirements and emissions standards for on-road and off-road fleets and engines.

v. Install diesel particulate filters and utilize diesel oxidation catalysts on off-road equipment and vehicles.

vi. Discontinue all construction activities during first stage smog alerts and first stage ozone alerts and/or curtail construction during periods of high ambient pollutant concentrations.

vii. Produce concrete on site if determined to be less emissive than transporting ready mix.

viii. Lead agencies proposing projects will require their contractors, as a condition of contract, to reduce construction-related fugitive reactive organic gas emissions by ensuring that low-volatile organic compound (VOC) coatings are used during construction. The project applicant will submit evidence of the use of low-VOC coatings prior to the start of construction.

ix. Use locally sourced or recycled materials for construction materials, to the greatest extent feasible.

x. Implement reasonably available emission-control technology (i.e., U.S. Environmental Protection Agency [USEPA] Tier 4), including equipment and vehicles with zero-emission or lower-emission engines.

xi. Use low/zero carbon or alternative fuels, such as B20 biodiesel or renewable diesel.

3. **Dust Control Measures:**

i. Water exposed soil surfaces (e.g., access roads, staging areas) with adequate frequency for continued moist soil. Do not overwater to the extent that sediment flows off the site.

ii. Cover exposed stockpiles (e.g., dirt, sand) and/or water or stabilize them with nontoxic soil binders.

iii. Cover all trucks being utilized for transport and disposal of excavated material immediately after loading and throughout the transportation and disposal of excavated material. The cover must be installed in such a way to prevent wind from entering over the leading edge of the trailer rim.

iv. Install a rock pad or a construction mud mat at the project site's exit/entrance to protect streets and public rights-of-way. Design mats and rock pads to support the heaviest and widest equipment entering the project site.

v. Wash off all trucks and equipment, including their tires, prior to leaving the site.

vi. Use wet power vacuum street sweepers to remove any visible trackout mud or dirt on adjacent public roads at least once a day. Avoid use of dry power sweeping.

vii. Limit vehicle speeds on unpaved roads to 15 miles per hour.

viii. Complete all roadways, driveways, sidewalks, and parking lots to be paved as soon as possible. In addition, lay building pads as soon as possible after grading unless seeding or soil binders are used.

ix. Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 miles per hour.

x. Initiate landscaping and revegetation as soon as construction tasks allow in order to minimize wind erosion.

xi. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The local air district's or districts' phone number(s) will also be posted in a visible location.

xii. Implement erosion control, sedimentation control, and soil stabilization measures (CMM-WQ-a–j: 3) to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.

4. **Valley Fever Control Measures:**

i. Dust Control Measures (CMM-AQ-a–e: 3)

ii. Erosion Control, Sedimentation Control, and Soil Stabilization Measures (CMM-WQ-a–j: 3)

iii. Valley Fever Management Plan: In areas endemic for *Coccidioides* fungus, prior to starting construction the project applicant will consult with the County Health Department to develop a Valley fever management plan that includes specific measures to reduce the potential for exposure to Valley fever. The Valley fever management plan will include a program to evaluate the potential for exposure to Valley fever from construction activities and to identify appropriate dust management and safety procedures that will be implemented, as needed, to minimize personnel and public exposure to potential Valley fever–containing dust. Measures in the Valley fever management plan, which will be implemented as applicable, may include the following.

- Provide high efficiency particulate air–filtered air-conditioned enclosed cabs on heavy equipment, and train workers on proper use of cabs, such as turning on air conditioning prior to using the equipment.
- Require National Institute for Occupational Safety and Health–approved half-face respirators equipped with N-100 or P-100 filters to be used during any surface-disturbing activities if determined to be necessary based on a job hazard analysis. Require employees to wear respirators when working near earth-moving machinery if determined to be warranted after conducting a job hazard analysis.
- To the maximum extent practicable, phase work efforts to ensure that site preparation work involving significant surface disturbance (i.e., grading, filling, trenching) and work that does not involve significant surface disturbance are not collocated so that dust potentially generated by high winds coupled with disturbed soil instability will not affect workers or other receptors.
- Workers that are required to use respirators as determined by a job hazard analysis will be medically evaluated, fit-tested, and properly trained on the use of the respirators, and a respiratory protection program will be implemented in accordance with the applicable California Division of Occupational Safety and Health (Cal/OSHA) Respiratory Protection Standard (Cal. Code Regs., tit. 8, § 5144). To the maximum extent practicable, ensure that areas involving significant surface disturbance are stabilized as soon as ground-disturbing activities are completed.

5. **Asbestos Control Measures:**

   i. Comply with the Asbestos National Emission Standards for Hazardous Air Pollutants (40 C.F.R. Part 61, Subpart M) for asbestos removal and disposal for demolitions operations.

   ii. When performing construction activities in areas where naturally occurring asbestos, serpentine or ultramafic rock is present, the lead agency will coordinate with the applicable air pollution control or air pollution management district and implement the appropriate dust abatement measures according to the area of potential disturbance and the type of construction activity (e.g., road construction and maintenance, construction and grading operations) (Cal. Code Regs., tit. 17, § 93105).

6. **Health Risk Assessment:** Lead agencies proposing construction projects within 1,000 feet of existing sensitive receptors will prepare a site-specific construction and operational health risk assessment (HRA). If the HRA demonstrates that the health risk exposures for adjacent receptors will be less than applicable thresholds, then additional mitigation would be unnecessary. However, if the HRA demonstrates that health risks would exceed applicable project-level thresholds, additional feasible on- and off-site mitigation will be analyzed by the applicant to reduce risks to the greatest extent practicable.

7. **Minimize Construction-Related Traffic and Equipment Use:** Construction-related traffic and large equipment use will be minimized. The following measures will be implemented toward this goal to reduce construction-related emissions:

i. Reduce the number of large pieces of equipment operating simultaneously during peak construction periods.

ii. Schedule vendor and haul truck trips to occur during non-peak hours.

iii. Establish dedicated construction parking areas to encourage carpooling and efficiently accommodate construction vehicles.

iv. Identify alternative routes to reduce congestion during peak activities.

v. Develop a project-specific ride share program to encourage carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.

vi. Implement measures to reduce vehicle trips.

8. **Blasting Operations and Safety Plan** (CMM-GEO-a–e: 7) for fugitive dust control.

B. Reservoirs and Points of Diversion AQ Mitigation Measures

1. **Site-Specific Dust Control Plan:** Develop and implement a site-specific dust control plan to minimize generation and duration of dust emissions associated with construction (including blasting). Dust control measures will be developed in compliance with applicable air pollution control regulations.

2. **Recreational Boat Emissions Minimization Plan:** To reduce emissions from recreational boats at a new reservoir, develop and implement an emissions reduction plan, which will include strategies to reduce boat emissions. Strategies to be implemented could include:

   i. Post signage near launch areas encouraging boaters to turn off engines when not in use.

   ii. Provide free or reduced launch feels for low-emitting or electric boats.

   iii. Track boat usage and type (i.e., motorized, electric, nonmotorized) annually by maintaining records of the number and types of boats operated at the reservoir. To maintain these records, operate staffed kiosks at the reservoir, and require boat users to check in at these kiosks prior to launching their boats. Emissions from boat usage will be quantified based on these records, and the effectiveness of the emissions minimization plan will be assessed based on the quantification results and relative to the applicable air district threshold at the time of operations.

3. **Offset Criteria Pollutant Emissions Generated from Recreational Boating**: As applicable, enter into a memorandum of understanding with the appropriate air district to reduce criteria pollutant or pollutants from gasoline-powered recreational boats emitted in excess of applicable emissions threshold(s). Per 7.22 MM-AQ-a–e: B2, recreational boat emissions at the reservoir will be quantified and the emissions in excess of applicable air district threshold will be offset to the extent possible.

C. Water Treatment Facilities AQ Mitigation Measures

1. **Regulatory Compliance** (7.22 MM-WQ-a–j: D1) for recycled water use.

2. **Odor Management Plan:** Develop and implement a project-specific odor management plan to reduce odor-related impacts. Incorporate odor control measures into this plan,

including protocols for monitoring, reporting, and responding to odor complaints from the public, as well as odor control technologies and BMPs to minimize odor releases.

7.22.2.4 Biological Resources

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IV. Biological Resources					
Would the project:					
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service	☒	☐	☐	☐
b.	Have a substantial adverse effect on any riparian or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service	☒	☐	☐	☐
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal, pool, coastal, etc.) through direct removal, filling, hydrological interruptions, or other means	☒	☐	☐	☐
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	☒	☐	☐	☐
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	☒	☐	☐	☐
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	☒	☐	☐	☐

Sections 7.6.1.2, *Environmental Setting*, and 7.6.2.2, *Environmental Setting*, describe the terrestrial and aquatic biological resources setting, respectively, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Locating new or modified facilities in an area with a sensitive natural community, habitat for special-status species, or wetlands could have a substantial adverse effect on a candidate, sensitive, or special-status species; a riparian or other sensitive natural community; or federally protected wetlands. Locating new or modified facilities in a wildlife corridor or waterway could interfere with

the movement of native resident or migratory fish or wildlife species. In addition, depending on the project location, new or modified facilities could conflict with local policies or ordinances protecting biological resources and provisions of an adopted habitat conservation plan (HCP); natural community conservation plan (NCCP); or other approved local, regional, or state HCP.

Construction activities could result in direct mortality or harm to special-status amphibian, reptile, mammal, and bird species or associated habitat. Construction activities that may result in direct contact with wildlife or result in indirect impacts on wildlife include, but would not be limited to, demolition of structures; road and bridge upgrades; culvert improvements; digging holes or trenches where wildlife may be trapped; and movement of heavy machinery through construction areas, in staging areas, and along haul roads where these species could occur. Bird and bat roosts could also be disturbed through construction noise, physical vibration, and direct removal of structures that provide roosting habitat. Temporary or permanent nighttime lighting could adversely affect some special-status birds, mammals, and amphibians (e.g., disturb active bird nesting sites and bat foraging activities, make frogs more vulnerable to predation). Construction dust could affect species such as valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool terrestrial invertebrates, and California tiger salamander (*Ambystoma californiense*).

Construction activities could result in direct mortality or damage to special-status plant species or indirect damage by degrading special-status plant habitat or sensitive natural communities. Construction activities could require heavy machinery to move through construction areas, in staging areas, and along haul roads where these species could occur. Contact with construction vehicles could result in direct mortality or damage to species or their habitats. Special-status plants and sensitive natural communities may be present in the areas where construction activities may be performed. Without surveys to document these species and habitats and measures to adequately protect them, they could be removed and/or habitat could be degraded. Construction activities may introduce or spread invasive plant species through the movement of topsoil, fill, gravel, and construction equipment. Invasive plant species could degrade the habitat quality of sensitive communities, including wetlands, by competition with and suppression of native species.

Construction located in or near river reaches are expected to have high potential for impacts on special-status plant and animal species, habitat supporting biological resources, and sensitive natural communities. The surrounding habitat on riverbanks may include riparian vegetation and/or wetlands. Riparian vegetation may have to be removed to facilitate heavy equipment movement and wetlands also may be disturbed or permanently lost (e.g., direct removal, hydrological interruption) during construction activities. Construction activities in or near waterways could release sediment and possibly hazardous materials (e.g., oil or gas from construction equipment) into waterbodies, affecting water quality. Release of sediment can bury macroinvertebrates which are prey for fish and other aquatic species, coat or bury eggs from frogs and fish, and fill in pool habitat. Water quality impairments such as increased turbidity can negatively affect aquatic species and habitats.

Construction in or near the water can injure or kill special-status fish species. For example, if pile driving is needed to construct a cofferdam, it can create noise and vibration impacts harmful to fish. Stranding within cofferdams can occur if special-status fish species become trapped inside a dewatered area. Fish rescue in the dewatered area (seining, electrofishing) could injure or kill fish. Fish may also become entrained into pumps used during dewatering. Other construction equipment can create noise impacts harmful to fish. Construction activity that involves blasting could injure or

kill fish and wildlife due to the release of concrete particles to surface waters, and ground vibrations and noise from blasting could disturb terrestrial wildlife and injure or kill fish. In-water construction of facilities also can result in the loss of habitat for special-status aquatic species where the facilities are constructed through covering or removal of channel bottom substrates, removal of aquatic and/or riparian vegetation, and removal of access to aquatic habitat.

New or modified facilities could be sited and constructed within the boundaries of an adopted HCP; NCCP; other approved local, regional, or state HCP; or in areas covered by local policies or ordinances that protect biological resources. Siting and construction of new or modified facilities could conflict with general plan policies, zoning ordinances, or other requirements that address management of biological resources. Projects carried out by local agencies may be considered "covered activities" of adopted HCP or NCCP plans and, therefore, consistent. However, some new or modified facilities projects may not be covered activities that could conflict with these plans if the project precludes or potentially precludes implementation of the goals or objectives of the plans.

Impacts on biological resources associated with common construction activities would be potentially significant. The magnitude of construction impacts depends on the extent and duration of disturbance to existing habitat and species, and the extent of temporary and permanent habitat loss. Impacts can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-BIO-a-f: A (CMM-BIO-a–f). Mitigation can include seasonal work windows, preconstruction biological surveys, project design and siting to avoid and minimize impacts on sensitive habitat, and invasive species control measures. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-BIO-a–f: B–D can avoid or reduce additional impacts on biological resources associated with new and modified facilities. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for construction and operation of new and modified facilities are not known, impacts on biological resources cannot be determined with certainty at this time. Therefore, potential impacts on biological resources remain potentially significant.

Sections 7.6.1, *Terrestrial Biological Resources*, and 7.6.2, *Aquatic Biological Resources*, evaluate the operational effects on biological resources due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water recycling, water transfers, and agricultural and municipal conservation measures, and present applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Reservoir and points of diversion projects could have temporary and permanent effects on biological resources due to siting and construction (see *Common Construction*). The impacts on biological resources associated with reservoirs and points of diversion projects are related to the siting and size of the project and the scope and duration of construction. Construction of a large reservoir would take place over several years and would include major excavation activities potentially including blasting, tunneling, trenching, surface and groundwater dewatering, quarrying, and other construction activities. Many of the associated construction impacts can be mitigated through implementation of common construction mitigation measures. Operation of reservoirs and points of diversion could affect biological resources depending on the source of the water and how much flow is diverted away from the stream system. Extensive analysis is required before the initiation of construction because of potential long-term adverse effects on aquatic biological

resources. Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, details flow and ecosystem processes, including the effects of dams and altered flow regimes that negatively affect fish communities and the ecosystems they rely on.

It is expected that new reservoir projects would be located in natural landscapes and areas with a high potential for the occurrence of candidate, sensitive, or special-status plant and animal species; supporting habitat; and sensitive natural communities (including wetlands). Inundation of a large new reservoir would have the potential to result in the permanent loss of thousands of acres of wildlife habitat, including sensitive natural communities. Any existing habitat supporting candidate, sensitive, or special-status species within the footprint of a new reservoir would be completely replaced by aquatic lake habitat. There may also be adverse effects on aquatic species within the new reservoir footprint through inundation of existing aquatic habitats and disruption of surface hydrology. Large trees that provide nesting habitat could be killed by flooding required for reservoir creation, which could adversely affect migratory birds and conflict with applicable tree preservation policies or ordinances. Loss of riparian trees and related habitat could affect multiple candidate, sensitive, or special-status species.

Operation of new reservoirs could have varied direct and indirect effects on biological resources. Operation of new reservoirs would result in a change in the flow regime (timing and magnitude) and could alter water temperature downstream, which could result in impacts on candidate, sensitive, or special-status aquatic species. Impacts could include delaying or impeding migration or movement of special-status fish species in surface waters influenced by reservoir operation and loss of salmonid redds to riverbed scour and entombment in deposited sediment. Dams disrupt the flow of sediment and the capacity of the stream to convey sediment, which could affect downstream habitat or aquatic species sensitive to decreases in turbidity, for example. Reservoir operation may modify the operations of the CVP and SWP, which could affect candidate, sensitive, or special-status species if flows and/or water temperature in connecting streams or rivers are substantially affected. In addition, dams and altered flow regimes can reduce or eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter hydrodynamics, and alter scour and deposition. Flow changes in tributaries to the Delta could also affect flow and currents and could alter temperature and salinity gradients in the Delta. These flow changes could adversely affect candidate, sensitive, or special-status species; their habitats; and sensitive natural communities, including wetlands. Operation of a new reservoir could support the establishment and spread of invasive aquatic species if suitable conditions were created by the reservoir itself or by operation of the reservoir, and reservoir releases could facilitate the spread of those species to downstream aquatic habitats. New reservoirs could inadvertently create habitat for species that prey on, compete with, or displace special-status species. For example, installation of a dam and reservoir could improve habitat for bullfrogs, which prey on and compete with native frogs. New reservoirs could create mosquito habitat and require the application of pesticides for mosquito control, and aquatic herbicides may be required for invasive aquatic vegetation (as described in Section 7.22.2.8, *Hazards and Hazardous Materials*). Certain pesticides/herbicides can be toxic to aquatic and/or terrestrial species (e.g., pyrethroids are highly toxic to fish). For new reservoirs that include recreation opportunities, increased proximity of reservoir visitors to natural areas could cause wildlife to modify their movement patterns in avoidance of these areas. In addition, increased human activity could result in reduced use or avoidance of these areas by wildlife for breeding.

New on-stream reservoirs/dams would substantially interfere with the movement of native resident or migratory fish by cutting off access to headwater spawning and rearing habitat. New reservoir projects that include aboveground water conveyance facilities, such as canals, could interfere with

the movement of migratory wildlife species. New off-stream reservoirs would not likely directly block the movement of migratory fish species, although impingement and entrainment may occur at the point of diversion. Impingement or entrainment would not only interfere with the movement of native resident or migratory fish but also could adversely affect special-status fish species. Power transmission lines for new on- or off-stream hydropower reservoirs could adversely affect migratory and non-migratory birds. Collision with new transmission lines could cause injury or death of individuals from the collision impact or electrocution.

Modification of an existing reservoir would occur within the existing footprint of the reservoir and would therefore result in fewer impacts on biological resources relative to a new reservoir. Dredging for reservoir expansion could result in direct physical injury to aquatic species, including special-status species if present, although fish species would likely avoid areas actively being dredged. Some dredging may be required in river channels as part of construction of large points of diversion and could temporarily disrupt the movement of local and migratory fish species through increased turbidity or could result in direct injury. Dredging would temporarily alter habitat conditions for fish and other aquatic species through increases in turbidity and suspended sediment and by exposing fish directly to contaminants in sediment during suspension. Candidate, sensitive, and special-status species; their habitats; and sensitive natural communities could be affected in areas where dredged material is deposited.

New or changed points of diversion could affect special-status fish species and interfere with the movement of native resident or migratory fish during periods of diversion, if present. Special-status fish species and other aquatic species in the near vicinity of points of diversion could be impinged or entrained at the water diversion, which could result in injury or mortality, or could adversely affect fish migration. In addition, predation of special-status fish species could occur at larger points of diversion if there are areas near the point of diversion for predatory fish to aggregate.

Expected maintenance activities at new reservoirs, including recreation areas, and points of diversion could include general facility and ground maintenance (e.g., debris removal, vegetation control, rodent control) and facility repairs. Temporary in-water activities may be required for facility repairs or maintenance (e.g., removal of debris on fish screens). These activities, although limited in duration, could result in injury or mortality of special-status fish and wildlife species and habitat disturbance.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-BIO a–f: B could reduce impacts on biological resources associated with new or modified reservoirs and points of diversion. Large new and modified reservoir and diversion projects require extensive analysis and evaluation to ensure proper siting, design, construction, and functioning and to avoid impacts on biological resources. Operation must include releases or bypassing a portion of flows to preserve downstream ecological functions and/or to meet Delta water quality and flow objectives. Operation of new reservoirs and points of diversion would require consultation with and approval by state and federal wildlife and fisheries agencies to ensure that impacts on biological resources are avoided or minimized. New or modified reservoirs and points of diversion must be designed and operated to minimize impingement and entrainment effects on fish in compliance with applicable NMFS and USFWS design and operational criteria. Until mitigation measures are implemented, impacts remain potentially significant.

New or modified reservoirs and points of diversion can help facilitate water transfers. Sections 7.6.1, *Terrestrial Biological Resources*, and 7.6.2, *Aquatic Biological Resources* evaluate the effects of increased use of water transfers using existing infrastructure on biological resources, and present applicable mitigation measures to minimize or avoid these effects.

Groundwater Wells and Groundwater Storage and Recovery

Groundwater well projects, including those for groundwater storage and recovery, could result in effects on biological resources during construction (see *Common Construction*). Depending on the location, groundwater wells and groundwater storage and recovery projects could affect special-status species, conflict with local or regional plans, or affect wetlands. However, these facilities would be constructed in areas with porous substrates, well structures are typically small and unobtrusive, and the associated pipelines would be located underground. Groundwater well projects would likely occur in places that have been regularly disturbed by past or existing agricultural or urban land uses, and the project footprint for a single well would be relatively small. Similarly, groundwater storage and recovery would likely occur on previously disturbed lands such as agricultural fields. Therefore, construction impacts may be less substantial for these types of projects.

Once constructed, groundwater wells would require periodic inspection and maintenance. Well inspection and maintenance would not interfere substantially with the movement of native resident or migratory wildlife species or established wildlife corridors or impede the use of native wildlife nursery sites.

Operational effects on terrestrial and aquatic biological resources due to increased groundwater pumping and groundwater storage and recovery, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.6.1, *Terrestrial Biological Resources*, and 7.6.2, *Aquatic Biological Resources*, respectively.

Water Treatment Facilities

New water treatment facilities, including desalination facilities, could adversely affect biological resources due to siting and construction (see *Common Construction*). Modification of existing water treatment facilities to accommodate water recycling would have a lower potential to affect biological resources because construction-related facility modifications would occur within or relatively close to the footprint of an existing treatment facility. The recycled water distribution system would generally be located along the rights-of-way of existing roads and potentially in agricultural fields and other areas (e.g., parks, commercial campus landscapes, golf courses). Apart from agricultural fields, which can provide suitable foraging habitat for special-status raptor species such as Swainson's hawk (*Buteo swainsoni*) and white-tailed kite (*Elanus leucurus*), these other areas are expected to have a low potential for special-status plant and animal species, their habitats, or sensitive natural communities because they are typically located in relatively developed areas.

Operation of surface water treatment facilities could affect biological resources depending on the source of the water and how much flow is diverted away from the stream system for use. Impacts and mitigation measures would be similar to those described for new or modified reservoirs and points of diversion. Operation of intakes for surface water treatment facilities may result in impingement or entrainment of special-status fish and aquatic species and create conditions conducive to predation, as discussed for points of diversion. Subsurface intakes at an ocean desalination facility would not result in impingement or entrainment.

Desalination plant discharge-related effects on aquatic species can occur due to exposure to toxic concentrations of brine at the point of discharge. Salt, minerals, and other compounds produced as a byproduct of desalination are discharged from desalination facilities as hypersaline brine. Brine generated from desalination facilities may be double the salinity of ocean water. Discharge of brine from desalination facilities to surface water can adversely affect special-status fish species and other aquatic organisms near the discharge outlet. Because brine is denser than the receiving surface water, depending on the discharge method, the brine may settle on the seafloor and pose the greatest risk to benthic organisms. Studies have shown that exposure to the brine and other potentially toxic constituents in desalination effluent can have deleterious effects on bottom-dwelling marine life (Riera et al. 2011; Roberts et al. 2010). These effects include osmotic stress or shock, the potential formation of hypoxic or anoxic zones, endocrine disruption, compromised immune function, acute or chronic toxicity, and mortality. Some organisms may move away from areas with high salinity or hypoxia, which would change the structure of the local community (Roberts et al. 2010); but sessile organisms cannot move away from areas of impaired water quality and may experience more severe effects. Other organisms have physiological or behavioral changes that occur as a result of environmental cues like changes in salinity. In the ocean, adult fish, turtles, and mammals may avoid brine plume areas or would not experience adverse effects from brief exposure to higher salinity levels. Early fish life stages (i.e., eggs and larvae), would be more vulnerable than later life stages because early life stages are limited in swimming ability and are unable to avoid the brine discharge plume. Migratory fish like anadromous salmonids begin their lifecycle in fresh water and move into seawater as juveniles. Increases in salinity concentrations trigger morphological, biochemical, physiological, and behavioral changes in the fish to prepare them for their pelagic life stage (Björnsson et al. 2011). These fish also rely on lower salinity concentrations as a cue to adapt to freshwater conditions when returning to their nascent spawning habitat. Brine discharges into salmonid habitat have the potential to interfere with the normal salinity adaptations that occur in the fish (Roberts et al. 2010).

In addition to adverse effects from brine salinity, brine waste discharge may result in marine life mortality as a result of creating hypoxic or anoxic conditions or shearing stress from turbulent mixing. Because of the difference in density between brine and the ambient receiving water at the point of discharge, brine plumes can form a physical barrier that prevents adequate mixing of dissolved brine and causes hypoxia or anoxia in benthic organisms. Shear stress, which is the measure of friction or force from the discharge on an organism in the path of the discharge, can be lethal to marine life at certain velocities. This is a concern for facilities that discharge brine waste through multiport diffusers. Although this method rapidly dilutes the waste, the velocity of the brine waste at the point of discharge may result in marine life mortality. Organisms within a certain distance of the discharge would simultaneously be exposed to shearing stresses (when multiport diffusers are used) and toxic water conditions due to high salinity concentrations and/or other chemical constituents in the discharge. (SWRCB 2015b.).

Maintenance activities could include general facility and ground maintenance (e.g., debris removal, vegetation control, rodent control) and repairs. Temporary in-water activities may be required for facility repairs or maintenance. These activities, although limited in duration, could result in injury or mortality of special-status fish and wildlife species and habitat disturbance.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-BIO a–f: C would reduce impacts on biological resources associated with water treatment facilities. Operation of water treatment

facilities, including desalination facilities, would require consultation with and approval by state and federal wildlife and fisheries agencies to ensure that impacts on biological resources are avoided or minimized. Mitigation Measure 7.22 MM-WQ-a–j: D addresses potential hydrology and water quality impacts related to operation of water treatment facilities. In addition, project proponents of ocean desalination facilities must comply with the Ocean Plan to address effects associated with construction and operation of desalination facilities to minimize impacts on aquatic biological resources. In addition to regulatory compliance, mitigation would include ensuring that new overhead transmission lines are fitted with wildlife protective devices to prevent injury and mortality of birds; compensating for impacts on special-status species and sensitive habitats, and conducting environmental awareness training for reservoir personnel and contractors. Until mitigation measures are implemented, the impacts remain potentially significant.

Use of recycled water could increase incidental irrigation runoff, soil salinity, and saturate soils that may affect adjacent natural habitat and potentially sensitive species and plants. This would not significantly exceed current baseline conditions using community water sources, since salinity levels would be controlled and drainage channels are generally effective at capturing most runoff. Any discharge to surface waters would be regulated to comply with water quality objectives.

Operational effects on terrestrial and aquatic biological resources due to increased use of recycled water, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.6.1, *Terrestrial Biological Resources*, and 7.6.2, *Aquatic Biological Resources*, respectively.

Other Construction Projects

Construction of new boat ramps, stream gages and other monitoring devices, and water conservation projects requiring construction activities that result in ground disturbance (e.g., canal lining) could result in temporary and permanent effects on biological resources. Impacts can be mitigated through implementation of construction mitigation measures (see *Common Construction*).

Periodic maintenance for boat ramp extensions and replacement ramps would be required due to vehicle use, siltation, and gravel loss, for example. These maintenance activities may result in temporary water quality effects such as an increase in turbidity. Special-status terrestrial or aquatic species, sensitive natural communities, or federally protected wetlands would not be adversely affected because the area in which these activities would occur are already disturbed daily by boating and other recreational uses; therefore, these biological resources are unlikely to be present.

Canal lining or encasement could substantially reduce or eliminate water seepage from unlined canals that may have supported riparian and other sensitive natural communities or wetland vegetation adjacent to the canals, particularly in areas that are typically dry and do not support such habitat. Riparian and other sensitive natural communities and wetland vegetation could in turn provide quality habitat that supports a variety of special-status species. Once canal lining and encasement is complete, canal seepage would no longer be available as a water source and riparian and wetland habitat near the canal could be lost, potentially affecting sensitive plant and wildlife species. Loss of riparian habitat, including any large trees that provide nesting habitat, could adversely affect migratory birds and conflict with applicable tree preservation policies or ordinances. Loss of riparian trees could affect special-status animal species, such as cavity-roosting bats (e.g., pallid bat [*Antrozous pallidus*]) and ringtails (*Bassariscus astutus*).

Open canals may transect normal movement patterns of terrestrial wildlife and, as a drinking water source, can attract wildlife. Lining canals with concrete results in a steeper sideslope and faster flow

velocity compared to an unlined canal. These conditions could create a drowning risk to wildlife (including special-status species) attempting to drink from the canal or cross it. Open irrigation canals that are enclosed and buried could have a beneficial effect on terrestrial species migration and travel patterns because the original open canal, which may have been a migration barrier, would be buried as a pipe underground and the surrounding land revegetated. If an existing canal is modified to be an aboveground pipeline, it could interfere with an existing terrestrial migratory corridor.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-BIO-a–f: D could reduce impacts on biological resources associated with modification of unlined and/or open canals for the purpose of water conservation. This mitigation would include wildlife escape measures to avoid terrestrial wildlife drowning at lined canals as well as wildlife crossing measures for aboveground pipeline projects. Until mitigation measures are implemented, the impacts remain potentially significant.

Open irrigation canals may serve as a drinking water source to wildlife. If an existing open canal is encased to create an aboveground or belowground pipeline, this modification could result in the loss of a drinking water source for wildlife. However, this would be unlikely to result in a substantial adverse effect on a candidate, sensitive, or special-status wildlife species because it is likely that multiple sources of water would be within the area.

Maintenance of canals and stream gages and other monitoring devices would generally be minimal; they would occur periodically and likely involve a one- to two-person crew visiting the site once per month by automobile or boat. Maintenance activity could require repairs to constructed facilities but adverse effects on biological resources would not be expected because these activities would occur mostly in previously disturbed areas.

Mitigation Measures

7.22 MM-BIO-a–f: Mitigate impacts on biological resources

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction BIO Mitigation Measures (CMM-BIO-a–f)

1. **Regulatory Compliance:** Develop a mitigation and management plan in coordination with fish and wildlife agencies to implement all appropriate measures as required by ESA section 7 consultation and to satisfy any other local, state, and federal requirements for achieving no net loss of wetlands, riparian habitat, or other critical habitat or take of wildlife species of concern. The plan should be submitted to the local city/county environmental planning department, USACE, USFWS, CDFW, NMFS, applicable state or regional water board (e.g., as part of a Clean Water Act section 401 (33 U.S.C. § 1341) water quality certification application), and/or other oversight agencies as applicable for approval prior to its implementation if an impact on special-status species population(s) is determined to occur based on the biological assessment and evaluation of the final project site and design.
2. **Preconstruction Surveys:** Conduct preconstruction surveys (by a qualified biologist) for special- status species in accordance with USFWS, NMFS and CDFW (as applicable) survey methodologies and appropriate timing to determine presence and locations of

any special-status species and their habitats and to avoid, minimize, or compensate for impacts on special-status species in coordination with the appropriate resource agencies; demarcate the boundaries of construction buffers around sensitive habitats; and submit survey reports for approval according to applicable federal, state, and local agency guidelines. This may include hiring a qualified biologist to identify riparian and other sensitive natural communities, including wetlands, and/or habitat for special-status plants and animals. As part of preconstruction surveys, evaluate potential impacts on trees or other biological resources protected by local policies and ordinances and observe any permit requirements associated with these policies and ordinances. In addition, conduct a delineation of affected aquatic resource areas to determine the acreage of loss in accordance with current USACE methods.

3. **Avoid, Minimize, or Compensate for Impacts on Sensitive Natural Communities**: The following measures will be implemented to reduce impacts on sensitive natural communities.

    i. Avoid, minimize, or compensate for reduction in area and/or habitat quality of sensitive natural communities through implementation of the following.

    - Select project site(s) that would avoid sensitive natural communities.
    - Design, to the maximum extent practicable, project elements to avoid effects on sensitive natural communities.
    - Establish temporary construction buffers for wetlands, vernal pools, and other sensitive natural communities that could be affected by construction activities. A qualified biologist will determine the location of the buffer(s) prior to the start of construction. The outer edge of the buffer zones will be demarcated using flagging or temporary orange mesh construction fencing before initiation of construction activities and based on site-specific conditions, seasonal restrictions for wildlife, local planning department specifications, and resource agency requirements.
    - Replace, restore, or enhance on a "no net loss" basis, in accordance with USACE and the applicable regional water quality control board, wetlands and other waters of the United States and waters of the state that would be removed, lost, or degraded. In coordination with USACE and the regional water quality control board, a wetland mitigation and monitoring plan will be developed before any groundbreaking activity commences. Once the mitigation and monitoring plan is approved and implemented, mitigation monitoring will continue for a minimum of 5 years from completion of mitigation, or human intervention (including recontouring and grading), or until the performance standards identified in the approved mitigation and monitoring plan have been met, whichever is longer. Prior to commencement of any construction activities that could result in the permanent loss of wetlands, conduct a delineation of affected aquatic resources areas to determine the acreage of loss in accordance with current USACE and regional water board methods.
    - Compensate for unavoidable impacts to sensitive natural communities (other than waters of the United States or state) by restoring and/or preserving in-kind sensitive natural communities on site, or off site at a nearby site, or by

purchasing in-kind restoration or preservation credits from a mitigation bank that services the project site and that is approved by the appropriate agencies, in consultation with applicable regulatory agencies (at ratios that offset temporal loss of habitat value).

4. **Avoid, Minimize, or Compensate for Impacts on Special-Status Species:** The following measures should be implemented to reduce impacts on special-status species.

   i. Project Siting and Design: Site and design the project, in general, and construction footprint, in particular, to avoid, when possible, or otherwise minimize, impacts on special-status species and habitat occupied by special-status species (particularly critical habitat). Select project site(s) that would avoid habitats of special-status species (which may include foraging, sheltering, migration, and rearing habitat in addition to breeding or spawning habitat), and to the maximum extent practicable, (re)design project elements to avoid effects on such species.

   ii. Construction Schedule: To the extent feasible, schedule construction to avoid special-status species' breeding, spawning, or migration locations during the seasons or active periods that these activities occur. Construction will be allowed only if authorized by the appropriate state and federal resource agencies, and additional construction timing restrictions could be imposed by these agencies, to protect specific species. For example, all in-water construction activities where special-status species have the potential or are known to occur would be conducted during the allowable in-water work periods established by NMFS, USFWS, and CDFW.

   iii. Buffers: Establish buffers around special-status species habitats to exclude effects of construction activities. A qualified biologist will determine the location of the buffer(s) prior to the start of construction. The size of the buffer will be in accordance with USFWS, CDFW, and NMFS protocols, as applicable, for the applicable special-status species.

   iv. Nest Trees: Nest trees for special-status bird species will not be removed unless avoidance measures (e.g., establishing buffers between construction activities and active nests) are determined to be infeasible. If nest tree removal is necessary, remove the tree only after the nest is no longer active, as determined by a qualified biologist.

   v. Relocation of Special-Status Plants and Animals: As appropriate, relocate special-status plant and animal species (excluding state Fully Protected species, which cannot be authorized for relocation and must be fully avoided) or their habitats from project sites following USFWS, NMFS, and CDFW protocols (e.g., for special-status plant species, elderberry shrubs).

   vi. Compensation: Where impacts to special-status species are unavoidable, compensate for impacts by restoring or preserving in-kind suitable habitat on site, or off site, or by purchasing restoration or preservation credits (in compliance with CESA and the ESA) for affected state- or federally listed species from a mitigation bank that serves the project site and that is approved by the appropriate agencies, in consultation with the appropriate regulatory agencies (at ratios that offset the temporary loss of habitat value).

5. **Environmental Awareness Training:** Prior to the start of construction activities, all personnel will participate in mandatory worker environmental awareness training conducted by an agency-approved biologist or resource specialist. Construction personnel will be informed about the identification, potential presence, legal protections, avoidance and minimization measures, and applicable general protection measures for state- and federally listed species and associated habitats with potential to occur within or immediately adjacent to the project site. Construction personnel will be informed of the procedures to follow if these biological resources are disturbed during construction activities. For projects where the agency-approved biologist or resource specialist is not regularly on the project site, training may be provided via online/web-based meeting. For projects that may continue over an extended duration and require a large number of training events, a training video developed under the supervision of a qualified biologist or resource specialist may be used to train new personnel, as long as a biologist or resource specialist is available via phone to answer questions about the training or that may arise during construction.

6. **Incorporate Protection Measures for In-Water Construction:** Design in-water construction projects to avoid or minimize stranding of and direct injury to special-status aquatic species.

    i. Dewatering/Diversion: Any area to be dewatered will encompass the minimum area and time necessary to perform construction activities. Develop and implement a dewatering plan that describes proposed dewatering structures, design guidelines for contractors, and appropriate types of BMPs for the installation, operation, maintenance, and removal of those structures. Dewatering/diversion will be designed to avoid direct and preventable indirect mortality of fish and other aquatic species. Where feasible, dewatering/diversion will occur via gravity-driven systems. When pumping is necessary to dewater a work site, a temporary siltation basin and/or silt bags will be used to prevent sediment from reentering the wetted channel. Pump intakes will be covered with mesh per the requirements of current fish screening criteria to prevent potential entrainment of fish or other aquatic species that could not be removed from the area to be dewatered. Diverted flows must be of sufficient quality and quantity, and of appropriate temperature, to support existing fish and other aquatic life both above and below the diversion.

    ii. Cofferdams: Cofferdams may be installed if necessary to isolate the extent of the work areas. When feasible, construction of cofferdams will begin in the upstream area and continue in a downstream direction, allowing water to drain and fish and aquatic wildlife species to leave (under their own volition) from the area being isolated by the cofferdam, prior to closure. If pile driving (sheet piles) is required, vibratory hammers will be used, and use of impact hammers will be avoided. When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. All dewatering/diversion facilities will be installed such that natural flow is maintained upstream and downstream of project areas.

    iii. Fish and Aquatic Species Exclusion: Fish and other aquatic species will be excluded from occupying the area to be dewatered by blocking the stream channel above and below the area to be dewatered with fine-meshed block nets or screens while cofferdams and other diversion structures are being installed. Block net mesh will

be sized to ensure that aquatic species upstream or downstream do not enter the areas proposed for dewatering. Mesh will be no greater than 1/8-inch diameter. The bottom of the net must be completely secured to the channel bed. Block nets or screens will be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where aquatic species will be removed.

iv. Fish Capture and Relocation: Where potential in-water construction effects may result in take of special-status fish species, capture fish from the affected areas and relocate them to areas that would support their growth and development. Captured fish would be temporarily held in aerated coolers for transport to relocation sites. A fish capture and relocation plan will be developed and implemented for review and approval by appropriate agencies (e.g., CDFW, NMFS, USFWS, as applicable). The plan will describe the biologist qualifications, capture methods, capture and relocation work areas, and reporting requirements. Fish capture operations will occur at any project site where dewatering and resulting isolation of fish may occur; for example, when dewatering creates pools within the stream channel or when an enclosed area within a cofferdam is dewatered. Collection of fish from areas isolated by dewatering may occur by electrofishing, seine, dip net, throw net, minnow trap, and hand capture, or a combination of these. The appropriate collection method will be determined based on site conditions. If capture and relocation are not feasible or would not be the most protective approach to managing fish in the work area (e.g., dewatering not needed or appropriate; large, unconfined waterbody), other methods to protect covered fish species (e.g., timing restrictions around season and tide, bubble curtains) will be detailed in a plan and submitted for approval by the appropriate resource agencies.

v. Removal of Diversion and Barriers to Flow: Upon completion of in-channel construction activities, any diversions or barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate. Alteration of creek beds will be minimized; any imported material that is not part of the project design will be removed from streambeds upon completion of the project. When appropriate, cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than 1 inch per hour. Cofferdams in tidal waters will be removed during the lowest possible tide and in slack water to minimize disturbance and turbidity. Preproject flows must be restored to the affected surface waterbody upon completion of work at that location.

vi. In-Water Pile Driving: Develop a plan for pile-driving activities to minimize impacts on special-status species and submit it to relevant agencies for approval prior to the start of in-water pile-driving activities. The plan will describe the method with the least impacts on aquatic organisms and will identify the number, type, and size of piles; estimated sound levels caused by the driving; the number of piles that will be driven each day; qualifications of monitors; any other relevant details on the nature of the pile-driving activity; and the measures that will be implemented to minimize underwater sound pressure to levels below fish thresholds for peak pressure and accumulated sound exposure levels. Threshold levels for special-status fish under NMFS jurisdiction are established in the Fisheries Hydroacoustic Working Group's *Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities* (^FHWG 2008) and may be used as a guideline for special-status fish. Pile

driving will also follow the criteria outlined in the most recent version of the California Department of Transportation's *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish* (^Caltrans 2020). If thresholds are exceeded, sound dampening or attenuation devices will be implemented to reduce levels.

An agency-approved biologist will be on site during pile-driving activities to minimize effects on special-status species that could be present. If any stranding, injury, or mortality of special-status species is observed, federal and state wildlife agencies will be notified in writing (e.g., via email) within 24 hours, and in-water pile driving will cease until the applicable federal and/or state agencies provide guidance on how to proceed.

A silt curtain will prevent the release of a turbidity plume and trap sediment that may become suspended as a result of the pile driving. The silt curtain must restrict the surface-visible turbidity plume to the area of pile construction and must control and contain the migration of resuspended sediments at the water surface and at depth.

7. **Avoid or Minimize Impeding Access to Established Native Resident or Migratory Wildlife Corridors or Native Wildlife Nurseries for Fish or Wildlife Species during Construction:** Site the construction footprint to avoid or otherwise minimize impeding access to established native wildlife movement corridors or native wildlife nurseries. If impeding access cannot be avoided, provide alternative access to these areas through such means as culverts, overpasses, or underpasses, for example.

8. **Invasive Species Control Measures:**

   i. Follow guidelines in the CDFW *California Aquatic Invasive Species Management Plan* (^CDFW 2008), *Aquatic Invasive Species Disinfection/Decontamination Protocols* (^CDFW 2013), and/or *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (^Cal-IPC 2012), where relevant. Construction supervisors and managers will be educated on weed identification and the importance of controlling and preventing the spread of noxious weeds.

   ii. Construction material to be used in (or immediately adjacent to) streams and wetlands, such as seed mixes, mulch topsoil, sand, gravel, crushed stone, and rock, brought on the project site from an outside source will be free of invasive plant material.

   iii. Avoid the spread of aquatic invasive species (e.g., zebra/quagga mussels, New Zealand mudsnails, chytrid fungus) to and from the project area according to the current aquatic invasive species disinfection/decontamination protocols, such as *Aquatic Invasive Species Disinfection/Decontamination Protocols* (^CDFW 2013), *Aquatic Invasive Species Disinfection/Decontamination Protocols (Northern Region)* (^CDFW 2016a), or other similar protocols.

   iv. Consult with CDFW and local experts, such as the University of California Extension, county agricultural commissioners, representatives of county weed management areas, California Invasive Plant Council, and California Department of Food and Agriculture, to ensure that invasive plant species and populations are kept below preconstruction abundance and distribution levels.

v. Wash down all major construction equipment prior to entry into the project site in a manner that limits runoff, away from areas proximate to any stream/wetland resources.

vi. If invasive species are encountered, conduct appropriate treatment and removal methods. The preferred method is removal by hand followed by proper disposal. If hand removal is not effective, then herbicide/pesticide treatment may be necessary. Any herbicide spot treatment will be applied in accordance with approved herbicide treatment measures. Chemical use is restricted in accordance with approved application methods and BMPs designed to prevent exposure to nontarget areas and organisms. The use of any chemical considered for control of invasive species must be approved for use in California, adhere to all California Environmental Protection Agency Department of Pesticide Regulation (DPR) regulations, and be applied by a licensed applicator under all necessary state and local permits. A pest control advisor can ensure that legal, appropriate, and effective chemicals are used with appropriate methodologies. Aquatic pesticides will be applied in compliance with NPDES order(s), where applicable.

vii. Monitor the site for invasive plants after all construction activities have been completed and implement additional control activities if necessary.

9. **Avoid Vegetation Disturbance:** Minimize the amount of soil, terrestrial vegetation, emergent vegetation, and submerged vegetation (e.g., eelgrass and kelp in marine areas, submerged aquatic vegetation in brackish and freshwater areas) disturbed during project construction and completion. Disturbance to existing grades and native vegetation, the number of access routes, the size of staging areas, and the total area disturbed by the project will be limited to the extent of all temporary and permanent impacts as defined by the final project design. All roads, staging areas, and other facilities will be placed to avoid and limit disturbance to waters of the state and other aquatic habitats (e.g., streambank or stream channel, riparian habitat). When possible, existing ingress or egress points will be used, and/or work will be performed from the top of streambanks, from barges on the waterside of the stream or levee bank, or from dry gravel beds. Existing native vegetation will be retained as practicable, emphasizing the retention of shade-producing and bank-stabilizing trees and brush with greater than 6-inch diameter branches or trunks. Remove temporary access roads and decompact soils as necessary to support desired revegetation. Minimize vegetation disturbance and soil compaction by using low ground-pressure equipment with a greater reach or that exerts less pressure per square inch on the ground than other equipment.

10. **Staging Areas:** Where appropriate and practical, barges will be used to stage equipment and construct the project, while reducing noise, traffic disturbances, and effects on terrestrial vegetation. When barge use is not practical, construction equipment and project materials may be staged in designated upland staging areas. Existing staging sites, maintenance toe roads, and crown roads will be used for project staging and access to avoid affecting previously undisturbed areas. For projects that involve in-water work for which boats and/or temporary floating work platforms are necessary, buoys will be installed so moored vessels will not beach on the shoreline and anchor lines will not drag. Moored vessels and buoys will not be located within 25 feet of vegetated shallow waters.

11. **Revegetation Plan:** Develop and implement a revegetation plan if vegetation will be disturbed during construction. The revegetation plan will specify sites where revegetation will be implemented. Site contours will be returned to preconstruction conditions or designed to provide increased biological and hydrological functions. All temporarily disturbed areas will be decompacted and seeded/planted with the planting stock appropriate for the area, appropriate designs (e.g., plant arrangements that, when mature, replicate the natural structure and species composition of similar habitats), planting techniques, monitoring frequency, and success criteria (e.g., sapling trees no longer require active management). Where natural communities have been disturbed during construction, restore to similar or improved function. If an irrigation system is necessary for plant establishment, install and ensure that the system is operational prior to installation of plantings, or prior to any periods where the weather forecast may jeopardize successful establishment of plants. If erosion control fabrics are used in revegetated areas, they will be slit in appropriate locations as necessary to allow for plant root growth. Only non-monofilament, wildlife-safe fabrics will be used. All plastic exclusion netting placed around plantings will be removed after 2 years or sooner if practicable.
12. **Revegetation Monitoring and Reporting:** All revegetated areas will be maintained and monitored for a minimum of 2 years after replanting is complete and until success criteria are met to ensure the revegetation effort is successful. The standard for success is 60 percent absolute cover compared to an intact local reference site. If an appropriate reference site cannot be identified, success criteria will be developed for review and approval by the authorizing regional water board on a project-by-project basis based on the specific habitat affected and known recovery times for that habitat and geography. The project permittee will prepare a summary report of the monitoring results and recommendations at the conclusion of each monitoring year.
13. **Compliance with HCPs and NCCPs:**
    i. If the project site is within the planning area for any adopted HCP, NCCP, or similar conservation plan, consult CDFW and/or USFWS, as applicable, to identify any potential conflicts with the plan's goals, objectives, or conservation measures. Seek input regarding potential design features, conservation measures, or other mitigation strategies to avoid potential conflicts and achieve substantial conformance with the objectives of the HCP, NCCP, or similar conservation plan.
    ii. Comply with measures contained within an HCP or NCCP, as applicable. Consult with biologists who have training and are knowledgeable about HCPs or NCCPs in the region where the project is located.
14. **Construction WQ Mitigation Measures** (CMM-WQ-a–j)
15. **Avoid or Minimize Lighting and Glare Effects**: Minimize nighttime construction site lighting to minimize impacts on wildlife. If nighttime construction is necessary, all project lighting (e.g., staging areas, equipment storage sites, roadway, construction footprint) will be selectively placed and directed onto the roadway or construction site and away from aquatic habitats. Light glare shields will be used to reduce the extent of illumination into aquatic habitats. If the work area is located near surface waters, the lighting will be shielded such that it does not shine directly into the water. (See also

CMM-AES-a–d: 6 for additional mitigation for light and glare during construction and operation.)

16. **Dust Control Measures** (CMM-AQ-a–e: 3)
17. **Construction NOI Mitigation Measures: Noise-Reduction Measures** (CMM-NOI-a,b,d–f: 2) and **Vibration-Reduction Measures** (CMM-NOI-a,b,d–f: 3)
18. **Blasting Operations and Safety Plan** (CMM-GEO-a–e: 7) to reduce potential harm to special-status species from blast and pressure waves.

B. Reservoirs and Points of Diversion BIO Mitigation Measures

1. **Regulatory Compliance:** Consistent with California Fish and Game Code section 5937, cold water flows from reservoirs should be maintained and timed to provide for downstream temperatures at critical times of the year to ensure that fish below dams are kept in good condition. Additional regulatory authorities that protect cold water habitat include FERC license requirements, NMFS Biological Opinion requirements, regional water board basin plan requirements for the protection of beneficial uses, and State Water Board public trust authority. The project-specific environmental document will include an evaluation of a range of operating criteria that are consistent with updates to the Bay-Delta Plan. A water right application to appropriate water by permit with the State Water Board is required.
2. **Project Planning and Design**: Any new or modified reservoir and point of diversion would undergo extensive hydrologic modeling of operations and analysis of impacts on the aquatic ecosystem and fish species. Conduct feasibility studies to evaluate economic justification, environmental compliance, and technical standards. For a new reservoir, study alternatives including off-stream locations to avoid or minimize ecosystem disruptions (e.g., blocking migration and exchange of sediment and nutrients in the stream). Conduct and implement predation studies at intakes and other locations to provide information on predatory fish and predation rate to inform the project plan and design to avoid or reduce inadvertently creating habitat for species that prey on, compete with, or displace special-status species. The final design specifications will include any potential schedule constraints, including key fish spawning, bird nesting, or winter hibernation periods of species that could be affected by the project—particularly construction.
3. **Reservoirs and Points of Diversion WQ Mitigation Measures** (7.22 MM-WQ-a–j: B)
4. **Avoid or Minimize Impeding Access to Established Native Resident or Migratory Wildlife Corridors or Native Wildlife Nurseries for Fish or Wildlife Species**

    i. Protect habitat for migratory waterfowl and shorebirds by expanding existing wildlife refuges and management areas and establishing new ones in or near wetland areas used by migratory waterfowl and shorebirds. Manage these areas by establishing suitable vegetation, hydrology, and other habitat components to optimize the use by migratory waterfowl and shorebirds.

    ii. Protect, restore, and enhance connectivity of habitats, including but not limited to, wetland and riparian habitats that function as migration corridors for wildlife species. Acquire areas with potential to increase connectivity between existing habitats; protect these areas in perpetuity through the acquisition of conservation

easements, deed restrictions, or similar tools; and restore the habitat for wildlife species in these areas. Habitat restoration might be accomplished by establishing suitable hydrology or other physical conditions for desirable vegetation, planting desirable vegetation, fencing and managing grazing, and other means.

iii. Protect migratory pathways for migratory aquatic species such as salmon, steelhead, and sturgeon, including those that use Delta tributaries and floodplain habitats, by screening diversions and removing migration barriers.

iv. Avoid or minimize alteration of flow patterns and water quality effects that could disrupt migratory cues for migratory aquatic species by implementing water management measures and establishing programs to reduce water pollution. This includes protecting peak flows that provide critical habitat.

5. **Dredging Plan:** Develop and implement a dredging plan to avoid direct physical injury to aquatic species, including special-status species if present, and to avoid and reduce disrupting the movement of local and migratory fish species through increased turbidity areas.

6. **Minimize Intake Impacts on Fish:** Design and operate surface water intakes to minimize effects on fish. Comply with applicable NMFS and USFWS fish screen engineering design and operational criteria for the region where the project is located to minimize impingement and entrainment. Fish screens will be inspected and maintained regularly to ensure that they are functioning as designed and meeting applicable fish screening criteria. Screens will be visually inspected while in operation to ensure that they are performing properly. BMPs associated with fish screen maintenance and repair will be implemented to minimize effects on special-status fish species and to ensure that fish are not passively entrained into the diversion canal.

7. **Compensate for Impacts on Special-Status Species and Habitat**: Compensate for direct and indirect effects on special-status species habitat by restoring disturbed habitat or preserving occupied habitat, preferably in the vicinity of the affected area, at a minimum of 1:1 ratio. Retain a qualified biologist to assess habitat to be restored or preserved and to provide guidance on habitat restoration. Conduct monitoring at the preserved area to ensure that habitat conditions are maintained at baseline conditions or better. A qualified biologist will conduct monitoring of restored habitat to ensure that restored habitat conditions are maintained and to make adaptive management recommendations for habitat improvements.

8. **Recreation Management Plan:** Prepare a recreation management plan for a new reservoir project that includes recreational areas. The plan will include actions such as the installation of signage and exclusion fencing to avoid recreational (e.g., hiking and camping) disturbance of sensitive natural communities and/or special-status species habitat, if applicable. The goal of these actions will be to avoid and reduce disruption of sensitive habitats and vegetation, including special-status plant populations that were avoided during construction of recreational areas.

9. **Environmental Awareness Training:** An environmental awareness training program will be implemented to familiarize on-site employees (including maintenance employees) and contractors with the regulatory requirements and potential environmental concerns associated with operations and maintenance on site. This

program will include identification of sensitive natural resources and will discuss ways to avoid impacts on these resources.

10. **Reduce Bird Collisions with Overhead Power Lines:** Ensure that new overhead power lines and associated equipment are properly fitted with wildlife protective devices to isolate and insulate structures to prevent injury or mortality of birds. Protective measures will follow the guidelines provided in *Reducing Avian Collisions with Power Lines: The State of the Art* (Avian Power Line Interaction Committee 2012), or the current Avian Power Line Interaction Committee guidelines in place at the time the transmission lines are installed, and will include insulating hardware or conductors against simultaneous contact, using poles that minimize impacts on birds, and increasing the visibility of conductors or wires to prevent or minimize bird collisions.
11. **Maintenance Activities:** Comply with all applicable Construction BIO Mitigation Measures (CMM-BIO-a–f) and Herbicide and Pesticide Use (CMM-HAZ-a–h: 4) when conducting maintenance activities, especially for work on or near waterbodies.

C. Water Treatment Facilities BIO Mitigation Measures

1. **Reservoirs and Points of Diversion BIO Mitigation Measures (7.22 MM-BIO-a–f: B)**
2. **Water Treatment Facilities WQ Mitigation Measures (7.22 MM-WQ-a–j: D)**
3. **Desalination Facilities BIO Mitigation Measures:**
    i. Regulatory Compliance: In addition to consultation and compliance with fish and wildlife agencies, project proponents of ocean desalination facilities will comply with California Water Code section 13142.5(b) to minimize the intake and mortality of marine life. The new or expanded ocean desalination facility will use the "best available site, design, technology, and mitigation measures feasible." In addition, the project proponent will comply with the California Coastal Act through consultation with the California Coastal Commission and the local city/county planning department (as necessary) as part of the Coastal Development Permitting process.
    ii. Desalination Facilities WQ Mitigation Measures (7.22 MM-WQ-a–j: D4)
4. **Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures** (7.22 MM-WQ-a–j: C)
5. **Reduce Bird Collisions with Overhead Power Lines** (7.22 MM-BIO-a–f: B10)
6. **Maintenance Activities:** Comply with all applicable Construction BIO Mitigation Measures (CMM-BIO-a–f) and Herbicide and Pesticide Use (CMM-HAZ-a–h: 4) when conducting maintenance activities, especially for work on or near waterbodies.

D. Other Construction Projects BIO Mitigation Measures

1. **Wildlife Escape Measures:** Two types of wildlife escape could be used for lined canals: A standard method would be to construct escape ramps on the sidewalls of the canal at intervals of 1,000 feet or more. Because of the spacing, wildlife would be exposed to fatigue and injury attempting to escape while floating between ramps. Deflector cables might be needed to channel swimming wildlife to the ramp. Another method would be to develop slipform ridges while placing the concrete lining. The ridges typically would be placed at 18-inch intervals on both sides of the canal and protrude 1.5 inches from

the canal sideslope. Deflector cables would be added upstream from each drop structure to channel swimming wildlife to the sides of the canal.

2. **Wildlife Passage at Aboveground Pipelines:** Where aboveground pipelines may be constructed to replace unlined canals, design/construct pipelines to provide reasonable opportunities to wildlife for crossing under or over pipelines. Crossing placement will consider wildlife habitat corridors and attempt to maintain movement corridors for species expected to occur. Data sources, including preconstruction surveys (see CMM-BIO-a–f: 2), vegetation/topographical maps, and LIDAR (i.e., light detection and ranging remote sensing method) may inform these decisions and influence the location of the crossing(s).
3. **Avoid, Minimize, or Compensate for Impacts on Sensitive Natural Communities** (CMM-BIO-a–f: 3) (i.e., potential impacts on riparian and other sensitive natural communities or wetland vegetation due to the reduction or elimination of water seepage from unlined canals).

7.22.2.5 Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
V. Cultural Resources				
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5	☒	☐	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5	☒	☐	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	☒	☐	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries	☒	☐	☐	☐

Sections 7.7.2, *Environmental Setting*, and 7.7.3, *Regulatory Setting*, describe the cultural resources environmental and regulatory settings, respectively, and additional cultural resources regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Construction of new or modified facilities in areas where cultural resources (significant historical, archeological, or paleontological resources) may be present could result in a substantial adverse change in the significance of a historical or archaeological resource (as defined in 14 Cal. Code Regs., § 15064.5); directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or disturb human remains, including those interred outside of formal cemeteries. Construction activities could potentially damage an archaeological site or historic built environment resource, which could alter or diminish its significance under the National Register of Historic Places

(NRHP) or the California Register of Historical Resources (CRHR). Historical resources that could be affected include transportation-related features such as marine and riverine landings and water conveyance systems such as dams, ditches, and canals. Types of archaeological properties that could be affected include midden, mounds, and surficial artifact scatters. Impacts could result from ground-disturbing activities, such impacts on unknown buried or near-surface resources. Deep excavation at a construction site or construction projects sited on relatively undisturbed or undeveloped areas where excavation is required may have a greater potential to encounter as-yet unrecorded cultural resources. Changes in topography, hydrologic patterns, and soil movement may also degrade or otherwise affect near-surface archaeological or built environment resources. Other effects on cultural resources, albeit typically built environment resources, include damage from dust, which can alter the appearance of a historic resource making it difficult to see and potentially hiding historical information as the potential of dust interacting with an object's surface could cause damage or chemical alteration. In addition to dust, impacts on cultural resources from visual obstructions, whether they are temporary or permanent, could potentially diminish the resource's integrity.

Cultural resources also could be affected if construction enables access (by construction crews or the public) to sites that were not previously known or accessible, which could result in unauthorized removal or vandalism of cultural resources. Access to cultural resources during construction could be reduced and thereby prevent or impair visits to cultural resources by people with a religious or cultural connection to the resource. Impacts on historic built environment resources may also result from vegetation clearing, and generation of dust, and visual impacts from the presence of large-scale equipment, machinery, and vehicles, particularly if the affected cultural resources have an associated landscape or other visual component that contributes to their significance, such as a sacred landscape or historic trail. Additionally, construction activity, including pile driving, has the potential to cause vibration that could physically damage or alter nearby historic built environment resources or linear features.

Impacts on cultural resources associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-CUL-a–d: A (CMM-CUL-a–d). Mitigation would include preconstruction surveys, monitoring during construction, and avoidance. If avoidance is not feasible, data recovery and/or removal of the resource would minimize those impacts by recovering valuable archaeological data through conducting intensive subsurface investigations. In addition, as discussed in more detail below, implementation of Mitigation Measure 7.22 MM-CUL-a–d: B can avoid or reduce additional potentially significant impacts on cultural resources associated with new or modified reservoir projects. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, cultural impacts cannot be determined with certainty at this time. Therefore, potential impacts on cultural or paleontological resources remain potentially significant.

Reservoirs and Points of Diversion

Reservoir and point of diversion projects can range from small projects (e.g., simple relocation of an existing diversion structure) to large projects (e.g., constructing a new dam and reservoir). Depending on the type and size of the project, construction activities could take place over several years and would include major excavation activities, particularly for the dam and inundation footprint for new reservoirs, as well as tunneling, trenching, surface and groundwater dewatering,

quarrying, potentially demolition, and other activities. Many of the associated construction impacts for small reservoir and diversion projects can be mitigated through the implementation of common construction mitigation measures (see *Common Construction*). Cultural resources could be disrupted by ground disturbing activities as part of construction, as well as by operation of a new reservoir or of an existing reservoir where the footprint is expanded to increase storage.

For larger dam and diversion projects, extensive analysis and evaluation is required before any construction because of likely long-term significant impacts on cultural resources. New and expanded reservoir projects could permanently flood areas with buried or surficial historical, archaeological, or paleontological resources; unique geologic features; or human remains. Changes in reservoir levels due to ongoing operations could expose previously inundated cultural resources or human remains to increased wave action, erosion, and human activity (e.g., looting). Depending on several criteria, a dam may be considered a historical resource and eligible for listing on the CRHR and NHRP. A dam raise project could cause a substantial adverse change to a historical resource if the existing dam were recognized as such. If archaeological and/or paleontological resources exist in native soils below accumulated sediment in an existing reservoir, dredging as part of reservoir expansion, could directly adversely affect these cultural resources.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-CUL-a–d: B could reduce impacts on cultural resources associated with new or modified reservoirs. Project proponents for a dam raise project must determine whether the dam is eligible for listing in the CRHR. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including cultural resource impacts and opportunities. Postconstruction interpretive features to educate the public on the cultural and historical aspects of the project should be considered in preproject planning and feasibility studies. Monitoring during dredging for reservoir expansion to avoid encountering native sediments would minimize potential adverse effects on buried cultural resources. Until mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery

Construction of groundwater wells, including for groundwater storage and recovery projects, could affect cultural resources (see *Common Construction*) or result in the discovery of human remains. Groundwater wells would likely occur in places that have been regularly disturbed by past or existing agricultural or urban land uses, and the project footprint would be relatively small. Similarly, groundwater storage and recovery would likely occur on previously disturbed lands such as agricultural fields. As explained in Section 7.7, *Cultural Resources*, once constructed, operation of these projects would not result in substantial changes to or effects on cultural resources because there would not be new ground-disturbing activities.

Water Treatment Facilities

New water treatment facilities, including desalination facilities, could adversely affect cultural resources and human remains primarily due to siting and construction (see *Common Construction*). Modification of existing water treatment facilities to accommodate water recycling would have a lower potential to affect cultural resources because modifications would occur within or relatively close to the footprint of an existing treatment facility.

Operation of water treatment facilities, including desalination facilities, would involve no ground- or structure-disturbing activities and therefore would not adversely affect any known or as-yet unrecorded cultural resources, including built environment resources or human remains.

Mitigation Measures

7.22 MM-CUL-a–d: Mitigate impacts on cultural resources

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction CUL Mitigation Measures (CMM-CUL-a–d)

1. **Regulatory Compliance:** Conduct construction activities in compliance with all applicable federal, state, and local laws and regulations, including but not limited to, the National Historic Preservation Act (54 U.S.C. § 300101 et seq.); Antiquities Act (16 U.S.C. §§ 431–433); Archaeological Resources Protection Act (16 U.S.C. §§ 470ee–470mm); Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001 et seq.); CEQA and the State CEQA Guidelines (Pub. Resources Code, § 2100 et seq., §§ 21083.2–21084.1; Cal. Code Regs., tit. 14, § 1500 et seq.); Pub. Resources Code sections 5020–5029 and 5097 et. seq.; Health and Safety Code section 7050 et seq.; and any relevant local general plan.
2. **Preconstruction Surveys for Historical, Archaeological, and Paleontological Resources; Cultural Landscapes; and Traditional Cultural Properties:** Conduct cultural resources surveys, subsurface investigations, and other research to determine whether early Native American and post-contact-era archaeological resources, cultural landscapes, or traditional cultural properties in the project area are eligible for listing in the CRHR.
3. **Cultural Resources Management Plan:** Prior to the start of any ground-disturbing activities, a qualified archaeologist will be retained (per the Secretary of the Interior's Professional Qualification Standards) to prepare a comprehensive site-specific Cultural Resources Management Plan (CRMP). The purpose of the CRMP is to document the actions and procedures to be followed to ensure avoidance or minimization of impacts on cultural resources consistent with CEQA Guidelines section 15126.4(b), and to develop a detailed program of mitigation for direct and indirect impacts on cultural resources during project implementation.

   The CRMP will include, but is not limited to, the following measures.

   i. A description of the roles and responsibilities of cultural resources personnel, and the reporting relationships between project construction management and the mitigation and monitoring team, including lines of communication and notification procedures.

   ii. Prescribed actions to be taken in the event that cultural resources are inadvertently discovered during construction, or known resources are affected in an unanticipated manner.

   iii. Specific measures to be taken to avoid impacts on significant cultural resources, such as the designation of environmentally sensitive areas.

iv. Artifact collection, retention/disposal, and curation policies, including a statement that all cultural materials retained will be prepared in accordance with the requirements of an identified, qualified curatorial facility.

v. Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (36 C.F.R. pt. 67) in the event of relocation. If any historic buildings, structures, or levees are relocated or altered, the lead agency must ensure that any changes to significant buildings or structures conform to these standards.

vi. If eligible or significant resources cannot be avoided and would be affected by a project, complete appropriate documentation, archival practices, and communication with the Native American Heritage Commission and Native American community, depending on project-specific circumstances.

4. **Unanticipated Discovery Measures:** Construction will stop within a 50-foot radius of any archeological, paleontological, or historical resources discovered during construction activities, and treatment measures will be devised as needed. A qualified archaeologist or other qualified cultural or paleontological resources specialist will be brought on site within 24 hours of the discovery. If the specialist determines the find is significant, a full archaeological survey will take place. Construction activities in the area would resume once the survey is completed.

   If human remains are discovered and become exposed, follow procedures under Health and Safety Code, section 7050.5, and Pub. Resources Code, section 5097.9. If the human remains occur on lands owned and administered by a federal agency, the provisions of the Native American Graves Protection and Repatriation Act will apply.

5. **Oversight and Monitoring of Construction Activities:** Require a qualified professional cultural or paleontological resources specialist (per the Secretary of the Interior's Professional Qualification Standards) trained to identify paleontological, archaeological, and built environment resources in a construction setting during project ground-disturbing activities if significant cultural or paleontological resources are known to exist on the project site or if there is a high probability for significant cultural or paleontological resources to exist.

6. **Worker Cultural Resources Sensitivity Training:** A worker cultural resources sensitivity program will be implemented for the project. Prior to any ground-disturbing activity, an initial sensitivity training session will be provided to all project employees, contractors, subcontractors, and other professionals prior to their involvement in any ground-disturbing activities. The sensitivity program will address the cultural (Native American, archaeological, and paleontological) sensitivity of the project site; and a tutorial will provide information on how to identify these types of resources; appropriate behavior, worker access routes and restrictions, specific procedures to be followed in the event of an inadvertent discovery per the CRMP, and consequences in the event of noncompliance.

7. **Dust Control Measures** (CMM-AQ-a–e: 3)

8. **Construction NOI Mitigation Measures: Noise-Reduction Measures** (CMM-NOI-a,b,d–f: 2) and **Vibration-Reduction Measures** (CMM-NOI- a,b,d–f: 3)

9. **Construction Site Security** (CMM-HAZ-a–h: 7)

10. **Construction AES Mitigation Measures: Project Siting and Design** (CMM-AES-a–d: 1) and **Screen Construction Areas** (CMM-AES-a–d: 2)

B. Reservoirs and Points of Diversion CUL Mitigation Measures

1. **Historic Dams and Structures:** For reservoir expansion projects affecting an existing dam, determine whether the dam is eligible for listing in the CRHR treatment of historic dams and structures under Pub. Resources Code section 21084.1 and California Code of Regulations section 15064.5 subdivision (a). A cultural resource management strategy for recording and evaluating dams or structures will be conducted prior to any modifications. This includes a records search of the area; a field recordation of the dam and any associated historical structures on California Department of Parks and Recreation series 523 forms, specifically 523B (building, structure, or object) and/or 523E (linear resource); and submission of these materials and any nominating materials to the State Historical Resources Commission of the California Office of Historic Preservation.

2. **Project Planning**: Preproject planning for reservoir and dam projects requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility. A project design may provide opportunities for historic preservation such as leaving portions of an existing historic structure or avoidance altogether. Consider postconstruction interpretive features to educate the public on the cultural and historical aspects of the project.

3. **Coordination with General or Resource Management Plan**: Coordinate with relevant general plan (private land) or resource management plan (public land), including provisions for inventory, evaluation, research, and interpretation of cultural resources. Plans will contain site management measures, training for all operations and maintenance staff, and routine monitoring of known cultural resources. Implement any relevant Historic Properties Management Plan or CRMP to meet the requirements of section 106 of the NHPA for projects on federal lands, and to coordinate historic preservation reviews in conjunction with other aspects of a project.

4. **Monitoring of Dredging:** If dredging of reservoir sediment may exceed the depth of the historical flood deposits and encounter native sediment, dredging will be monitored by a qualified archaeologist and paleontologist. If this occurs and archaeological and/or paleontological materials are observed, dredging in proximity of the discovery will be diverted until a qualified archaeologist and/or paleontologist evaluates the discovery.

7.22.2.6 Energy and Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VII. Energy				
Would the project:				
a. Adversely affect the reliability of California's electric grid	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
b. Result in inefficient, wasteful, and unnecessary energy consumption	☒	☐	☐	☐
VII. Greenhouse Gas Emissions				
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	☒	☐	☐	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	☒	☐	☐	☐

Section 7.8.2, *Environmental Settin*g, describes the energy setting. Sections 7.10.2, *Environmental Setting*, and 7.10.3, *Regulatory Setting*, describe the GHG emissions environmental and regulatory settings. Additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Because of the connection between energy use and GHG emissions, these two resources are addressed together in this section. Note that energy and GHG emissions are analyzed independently in Sections 7.8, *Energy*, and 7.10, *Greenhouse Gas Emissions*, for changes in hydrology and water supply associated with the proposed Plan amendments. Section 7.8 addresses overall per-capita energy consumption, reliance on natural gas and oil, and renewable energy as a means of achieving the goal of energy conservation as identified in CEQA Appendix F, *Energy Conservation*. A more abbreviated and combined analysis is presented in this section for new or modified facilities.

New or modified facilities would result in energy consumption and GHG emissions primarily from construction activities. Total GHG emissions and the energy required for construction activities would depend on the size of the project; duration of construction activities; the types, quantities, and energy efficiency of equipment used; and the materials required for construction (e.g., gravel, cement). Depending on the location of the project sites and the corresponding applicable jurisdictional air quality management district or air pollution control district regulations, GHG emissions generated by construction activities could exceed adopted air district thresholds and thereby conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

The most common construction impact on energy would be related to the energy required to operate heavy construction equipment. Various types of fuel-consuming equipment would be necessary for actions such as excavating, grading, transporting materials, and transporting construction workers to and from the worksites. Construction equipment such as trucks or barges, earthmoving equipment, and power tools require the use of petroleum products and electricity to operate. These energy demands would be temporary (i.e., limited to the construction period) and would be greatly reduced when construction activities are complete. Although construction-related energy consumption would be limited to the construction period, these activities would cause

irreversible commitments of finite nonrenewable energy resources such as gasoline and diesel fuel and could result in inefficient, wasteful, and unnecessary energy consumption.

Construction activities requiring heavy construction equipment, haul trucks, and worker vehicles would generate GHG emissions due primarily to gasoline and diesel usage (i.e., fuel combustion). Electricity consumed during construction would also generate indirect GHGs. The primary GHG emissions generated by construction are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The production of cement for concrete is energy intensive and results in substantial GHG emissions (CO_2); global CO_2 emissions from cement production in 2018 accounted for approximately 4% of global emissions from fossil fuels (Andrew 2019). Construction activities could also result in removal of vegetation that acts to sequester GHGs. Depending on the project size and location, equipment required, and construction duration, GHG generation during construction could affect the state's ability to meet future GHG reduction goals and conflict with regional or local plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. Activities may not be consistent with policies that have not been adopted as rules or regulations. For example, it may not be feasible to use electric or alternatively fueled equipment, which could conflict with a specific county's climate action plan. In absence of a state plan through 2050 to address electric power sector emissions, new or modified facilities may also conflict with the state's long-term emissions reduction trajectory.

Energy and GHG impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-EN-b/GHG-a,b: A (CMM-EN-b/GHG-a,b). Mitigation can include using energy-efficient equipment and other GHG emission control measures, as well as applicable air emission reduction measures and traffic control measures. Mitigation measures for energy and GHG emissions impacts would help ensure the efficient use of energy during construction. CARB has developed various statewide programs and strategies to reduce emissions related to on- and off-road sources such as heavy-duty construction equipment and vehicles. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-EN-b/GHG-a,b: B–D can avoid or reduce additional potentially significant impacts related to energy use and GHG emission associated with new or modified facilities. If these mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, energy use and GHG emission impacts cannot be determined with certainty at this time. Therefore, potential impacts on energy and impacts related to GHG emissions remain potentially significant.

The energy use of construction equipment would not adversely affect the reliability of California's electric grid because construction electricity requirements are low compared to total use of electricity in the state and because much construction activity is powered directly by fossil fuel and, as such, does not require use of the electric grid.

Reservoirs and Points of Diversion

Construction of new or modified reservoirs or points of diversion would result in energy consumption and GHG emissions (see *Common Construction*). Reservoir and point of diversion projects can range from small projects, (e.g., simple relocation of an existing diversion structure) to large projects (e.g., constructing a new dam and reservoir). The potential impacts on energy and the emission of GHGs associated with these projects are related to the size of the project, as well as the magnitude and duration of construction.

Once constructed, electricity would be required for pumping water for conveyance, as well as for operation of administration and maintenance buildings, at a minimum at both on-stream and off-stream reservoirs. Electricity would also be required for operation of new larger points of diversion (e.g., for screen cleaners, pumps, lighting, supervisory control and data acquisition [SCADA] systems). Because electricity could be obtained from fossil-fueled electricity generating facilities, operations could result in a net increase in GHG emissions. Where possible, projects would likely incorporate hydropower facilities to help power operations and reduce or offset power needs from the regional electric transmission grid. Hydropower generation would be influenced by the timing of releases, movement of water, and seasonal operational decisions. Gasoline and diesel fuel would be used for operation and maintenance activities. In addition, at new reservoirs that include recreational opportunities, fossil fuel would be consumed for recreational boating, where permitted, and recreationists' vehicle trips.

Even with some hydropower facilities, reservoirs and points of diversion would require electricity and gasoline for water conveyance and facility maintenance, and therefore could result in GHG emissions through the use of electricity and fossil fuel for the life of the project, which could conflict with plans and policies to reduce GHG emissions. Operation of a new off-stream hydropower reservoir could result in a net increase in GHG emissions because electricity, which could be obtained from fossil-fueled electricity generating facilities, would be required for conveying water to and from the reservoir and other purposes. The magnitude of GHG emissions from these projects would increase with the size of reservoir/diversion and associated power requirements/energy consumption.

Fossil fuel would be required over the long term for facility operation and maintenance (e.g., facility vehicle operation, back-up generators) for new reservoirs and points of diversion, which would result in increased GHG emissions. In addition, at new reservoirs that include recreational opportunities, GHG emissions could occur from recreational boating, where permitted, and recreationists' vehicle trips.

GHG emissions, primarily CH_4, and CO_2, from an expanded (via a dam raise) reservoir or a new reservoir would also result from inundation and decomposition of organic matter within the reservoir. Inundation can increase sedimentation and decomposition due to longer water residence times, which can also result in GHG emissions. Multiple variables influence GHG emissions from reservoirs, including water quality and nutrient content, dissolved oxygen concentrations, carbon stock in the soil and flooded biomass, and/or transported by upstream rivers. (Ion and Ene 2021).

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-EN-b/GHG-a,b: B and C would reduce GHG emission impacts associated with reservoirs and point of diversion projects. This mitigation includes regulatory compliance with all applicable state and federal energy efficiency standards and implementation of a GHG reduction plan. Until mitigation measures are implemented, the impacts remain potentially significant.

The energy consumed in operation of a new or expanded reservoir or a large point of diversion project would not adversely affect the reliability of California's electric grid. Most large new or expanded reservoirs projects would be expected to generate hydropower and would typically release more water during summer to meet higher water demands and thereby generate more power during that time, when electricity demand is highest. The energy required to power even a

large point of diversion would be relatively minor compared to the total electricity generated in the state.

New or modified reservoirs and points of diversion can help facilitate water transfers. The operational effects of increased use of water transfers using existing infrastructure on energy and GHGs are evaluated in Sections 7.8, *Energy*, and 7.10, *Greenhouse Gas Emissions*.

Groundwater Wells and Groundwater Storage and Recovery

Construction-related energy consumption and GHG emissions of groundwater wells and groundwater storage and recovery projects would primarily result from the use of fossil fuels and fuel combustion in heavy equipment (e.g., truck-mounted drill rig, haul trucks, crane, backhoe), respectively (see *Common Construction*).

Operational effects related to energy consumption and GHG emissions due to groundwater pumping and groundwater storage and recovery, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.8, *Energy*, and 7.10, *Greenhouse Gas Emissions*. As discussed in those sections, operation of groundwater wells could generate indirect GHG emissions from electric-powered pumps and direct GHG emissions from fossil-fuel powered pumps.

Water Treatment Facilities

Construction of water treatment facilities would result in energy consumption and GHG emissions (see *Common Construction*). Smaller construction projects (e.g., modification of an existing WWTP to add recycled water treatment facilities) would require less extensive use of heavy construction equipment and thus would require less energy and would result in lower GHG emissions relative to a larger project such as a new desalination facility.

Advanced water treatment for drinking water, as well as wastewater treatment for nonpotable recycled water, is energy intensive; nearly all the energy consumed is electricity. The more advanced the treatment level, the greater the energy required for water treatment. The energy consumed and therefore GHGs generated during operation of an existing WWTP that has been modified for the production of recycled water would result in an incremental increase in energy consumption relative to that of the existing WWTP (see Table 7.8-5, in Section 7.8, *Energy*, for the incremental energy required for water recycling for nonpotable use by geographic region). Because of the electricity consumed during water treatment, operation of water treatment facilities results in primarily indirect GHG emissions (CO_2). In addition, water treatment facilities, particularly recycled water facilities, also produce direct GHG emissions (CO_2, CH_4, and N_2O) from biological processes used in the treatment of wastewater (Campos et al. 2016). Because of the potentially substantial total GHG emissions (direct and indirect), depending on the project location, operation of these types of new facilities could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Operation of desalination facilities requires substantial energy consumption. This energy is mainly used to pressurize the saline water prior to flowing through the reverse osmosis membrane. Energy use for desalination varies depending on the salinity of the source water; the higher the salinity, the more energy is needed to remove the salt to meet water quality standards. Accordingly, ocean desalination is more energy intensive than brackish water desalination. Direct GHG emissions from operation of a desalination facility are relative insignificant relative to potential indirect GHG emissions associated with the electrical energy needs of a desalination facility (SWRCB 2015b).

Facilities that rely on alternative energy sources (e.g., hydropower, solar photovoltaic power, wind, or biofuels) could be operated as carbon neutral. However, it is unlikely that these energy sources would be able to meet the demand for continuous operation (SWRCB 2015b). Because of the potentially substantial total GHG emissions (direct and indirect), depending on the project location, operation of a desalination facility—particularly ocean desalination—could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-EN-b/GHG-a,b: B and D would reduce GHG emission impacts associated with water treatment facilities. This mitigation includes regulatory compliance with all applicable state and federal energy efficiency standards and implementation of a GHG reduction plan. New projects should be located to reduce conveyance distances where possible and should use gravity rather than pumps. Existing water treatment facilities should efficiently monitor and fix leaks in the distribution system and improve the efficiency of operating equipment. Until mitigation measures are implemented, the impacts remain potentially significant.

The overall increased electrical load due to operation of a new water treatment facility would be small compared to the existing local electrical demand and is unlikely to affect the reliability of California's electric grid. Further, operation of water treatment facilities would not result in inefficient, wasteful, or unnecessary consumption of energy because these facilities would provide reliable potable and nonpotable water to meet existing demand in affected areas.

Operational effects related to energy consumption and GHG emissions due to increased groundwater pumping (as might occur if groundwater were used as a water source for new drinking water treatment plants) and increased use of recycled water, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.8, *Energy*, and 7.10, *Greenhouse Gas Emissions*, respectively.

Other Construction Projects

Construction of new or modified boat ramps, stream gages and other monitoring devices, and canal lining and encasement projects would result in energy consumption and GHG emissions due primarily to the use of heavy construction equipment. The magnitude and duration of construction activities required for these types of projects are anticipated to be relatively limited. Accordingly, relative to larger construction projects, the energy consumption and associated GHG emissions would be substantially lower. Canal lining and encasement projects in California range in size from 1- to 2-mile canal segments to segments stretching over 30 miles. Large canal lining and canal encasement projects would have higher construction-related GHG emissions. Impacts can be mitigated through implementation of construction mitigation measures (see *Common Construction*). Once constructed, the energy consumed by these projects would be relatively minor (e.g., lighting for boat ramps), as would GHG emissions. Intermittent vehicle emissions may occur due to periodic monitoring and maintenance, which would produce low levels of GHG emissions not substantially different from baseline conditions.

Mitigation Measures

7.22 MM-EN-b/GHG-a, b: Mitigate energy and GHG emissions impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction EN/GHG Mitigation Measures (CMM-EN-b/GHG-a,b)

1. **Regulatory Compliance:** Comply with the legislative mandates of the State of California for the reduction in statewide GHG emissions, including Senate Bill 32 and Executive Order (EO) S-3-05 and EO B-55-18. Comply with any relevant regional or local plan, policy, or ordinance addressing GHG emissions.
2. **GHG Emission Reduction Measures:** Construction BMPs and onsite measures to reduce GHG emissions will be implemented and will include, but not be limited to, the following.
    i. Preserve known GHG sinks to the extent feasible and limit GHG sources as a component of project design.
    ii. Implement the most recent applicable air quality management district guidance and local air district controls to reduce criteria pollutant emissions and to minimize GHG emissions.
    iii. Use electric or hybrid-electric off-road construction equipment and vehicles instead of diesel-powered. Use vehicles that use alternative fuels.
    iv. Design and construct the project to be energy-efficient according to Cal. Code Regs., title 24, Part 6 (*Energy Efficiency Standards for Residential and Nonresidential Buildings*).
    v. Use at least 10 percent of building materials that are locally manufactured.
    vi. Divert and recycle or salvage non-hazardous construction and demolition waste.
    vii. Minimize the amount of concrete for paved surfaces and use a low-carbon concrete option.
    viii. Minimize tree removal and mitigate indirect GHG emissions increases that occur due to vegetation removal, loss of sequestration, and soil. When onsite preservation is not feasible, replace onsite trees, or contribute to a mitigation program providing carbon storage. Implement a tree-planting program to sequester an amount of GHG emissions equal to direct emissions produced during construction. Develop the program per the principles of CARB's *Compliance Offset Protocol Urban Forest Projects* (^CalEPA and CARB 2011).
    ix. When generators must be used, consider use of alternative fuels, such as propane or solar.
    x. Minimize idling time by requiring that equipment be shut down after 5 minutes when not in use (Cal. Code Regs, tit. 13, § 2485). Provide clear signage that posts this requirement for workers at the entrances to the site.
    xi. Maintain all construction equipment in proper working condition and perform all preventive maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules will be detailed and clearly posted for workers prior to commencement of construction.

xii. Implement a tire inflation program on each jobsite to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives onsite and every 2 weeks for equipment that remains onsite. Check vehicles used for hauling materials offsite weekly for correct tire inflation.

xiii. Develop a project-specific ride share program to encourage carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.

xiv. Reduce electricity use in temporary construction offices by using high-efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business, wherever feasible.

3. **Construction AQ Mitigation Measures: Regulatory Compliance** (CMM-AQ-a–e: 1), **Emission Reduction Measures** (CMM-AQ-a–e: 2), and **Minimize Construction-Related Traffic and Equipment Use** (CMM-AQ-a–e: 7)

B. Regulatory Compliance: Adhere to all applicable state and federal energy efficiency standards, including title 24, part 6 of the California Code of Regulations (*Energy Efficiency Standards for Residential and Nonresidential Buildings*). Entities that implement actions requiring increased operation of stationary source equipment (e.g., diesel pumps) will comply with all applicable local policies and regulations regarding air quality. (See also CMM-EN-b/GHG-a,b: 1 [*Regulatory Compliance*].)

C. Reservoirs and Points of Diversion EN/GHG Mitigation Measures

1. **Regulatory Compliance** (7.22 MM-EN-b/GHG-a,b: B)

2. **Project Design:** Design project to minimize energy consumption. For example, locate project to reduce conveyance distances where possible and use gravity rather than pumps. Where pumps are required, use energy-efficient pumps to transport water. The U.S. Department of Energy standards for energy-efficient equipment in 10 Code of Federal Regulations (C.F.R.) 431.462 (*Energy Efficiency Program for Certain Commercial and Industrial Equipment,* subpart Y. *Pumps*) establishes energy efficiency standards for clean water pumps. Where feasible, incorporate hydropower facilities to power the energy needs of conveyance pumping and delivery, as well as building maintenance.

3. **GHG Reduction Plan:** Prepare and implement a GHG reduction plan for project construction and operation. The purpose of the plan is to document direct and indirect GHG emissions due to project construction and operation and the net incremental emissions required to be offset to achieve net carbon neutrality for the project. The plan will include a commitment to incorporate all available feasible energy efficiency, recovery and conservation technologies. The plan will also include a detailed description of the GHG emissions footprint for all operational components of the project based on manufacturer energy usage specification data for each piece of equipment and the most current power system emissions factor available for GHG emissions based on the energy portfolio of the project's electricity provider. Construction- and operations-related GHG emissions will also be analyzed to determine whether these emissions would exceed applicable air district thresholds.

The reduction plan will include GHG mitigation strategies sufficient to offset project construction and operations (including maintenance) GHG emissions and ensure compliance with state and local plans to reduce GHG emissions. GHG mitigation strategies for construction would include, but not necessarily be limited to, those identified in CMM-EN-b/GHG-a,b: 2 (*GHG Emission Reduction Measures*). Additional GHG mitigation strategies for project construction, operation, and maintenance would include, but not necessarily be limited to, the following (or equivalent) measures.

i. Minimize the energy demand: Operate the project through implementation of reasonable and feasible design/energy efficiency measures.

ii. On-site renewable energy use: conduct an analysis to optimize on-site renewable energy use to further reduce GHG emissions based on site layout, environmental factors, and viable technology available.

iii. Renewable power purchase: procure renewable energy from off-site sources within California.

iv. Renewable energy certificates: procure and retire renewable energy certificates for projects or activities located in California.

v. Carbon offsets: If, after analyzing and requiring all reasonable and feasible on-site mitigation measures for avoiding or reducing greenhouse gas-related impacts, the lead agency determines that additional mitigation is required, the agency will consider additional off-site mitigation. The project proponent could, for example, procure and retire carbon offsets in a quantity necessary to achieve net carbon neutrality for the project. Consideration will be given to whether a mitigation ratio should be greater than 1:1 to reflect any uncertainty about the effectiveness of the offset.

4. **Vegetation Removal:** Remove existing vegetation within reservoir inundation footprint prior to inundation (7.22 MM-WQ-a–j: B8ii).

D. Water Treatment Facilities EN/GHG Mitigation Measures

1. **Regulatory Compliance** (7.22 MM-EN-b/GHG-a,b: B)

2. **GHG Reduction Plan** (7.22 MM-EN-b/GHG-a,b: C3)

3. **Project Siting and Design**: Through project siting and design, implement energy efficiency measures for new water and wastewater treatment measures including the following. Consider additional measures identified in *Energy Efficiency in Water and Wastewater Facilities: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs* (^USEPA 2013).

i. Locate project to reduce conveyance distances and use gravity rather than pumps, where feasible. Where pumps are required, use energy-efficient pumps to transport water. The U.S. Department of Energy standards for energy-efficient equipment in 10 C.F.R. 431.462 (*Energy Efficiency Program for Certain Commercial and Industrial Equipment,* subpart Y*. Pumps*) establishes energy efficiency standards for clean water pumps.

ii. Consider decentralized facilities to reduce energy costs of conveyance.

iii. Promote efficient use of water in the community served by the treatment facility.

iv. Fix leaks in distribution system.

v. Install SCADA software to increase the efficiency of process monitoring and operating control.

vi. For WWTPs, improve efficiency of aeration equipment, including system controls, energy efficient blowers, and diffuser technologies.

7.22.2.7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VI. Geology and Soils				
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
ii. Strong seismic ground shaking	☒	☐	☐	☐
iii. Seismic-related ground failure, including liquefaction	☒	☐	☐	☐
iv. Landslides	☒	☐	☐	☐
b. Result in substantial soil erosion or the loss of topsoil	☒	☐	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse	☒	☐	☐	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property	☒	☐	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water	☒	☐	☐	☐

Section 7.9.2, *Environmental Setting*, describes the geology and soils setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Depending on the location, construction of new or modified facilities could expose people or structures to potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure (including liquefaction) or landslides; result in substantial soil erosion or the loss of topsoil; be located on a geologic unit or soil that is unstable or would become unstable due to the project and would potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; be located on expansive soil; or be located on soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems. Construction actions that involve ground disturbance could potentially affect, or could be affected by, the geology and soil environment. Construction projects could occur in areas known to have seismic activity or experience landslides or could be located on expansive soil or on a geologic unit or soil that is unstable or would become unstable due to construction. Common construction activities in and of themselves would be unlikely to expose structures to potential substantial adverse effects related to rupture of a known earthquake fault or other seismic activity. However, workers could be exposed to seismic and geologic hazards during the construction period depending on project location, although the potential risk would be temporary and short-term. Any structures constructed as part of a project could be exposed to risk of loss due to rupture of an earthquake fault or seismic activity. If structures were built on soils prone to liquefaction, they could be damaged or destroyed during an earthquake.

Construction activities could occur in areas underlain by soft or loose soils, where high groundwater or seepage may be present and on sloping grounds. Areas of unstable soils with the potential for lateral spreading, subsidence, liquefaction, or collapse. For example, in areas of unstable soils, with the potential for lateral spreading, subsidence, liquefaction or collapse, heavy and/or tall equipment could sink, tip over, and/or be difficult to handle. Such unsafe working conditions would potentially expose people or structures to risk of loss, injury, or death. Construction of projects on deep organic soils could eventually result in structural damage due to subsidence. Construction activities like excavation and grading near unstable slopes could trigger a landslide, which could result in substantial adverse effects on people or existing structures.

Ground disturbance as part of construction, including grading and excavation, heavy equipment traffic, and changes to surface runoff patterns during construction could expose geologic materials or soil, destabilize the material, and cause soil erosion or loss of topsoil.

Siting projects on expansive soil (as defined in Table 18-1-B of the 1994 Uniform Building Code) could create risks to property through structural damage to buildings or roads. Expansive soils are susceptible to swelling and shrinking during rain events and to subsequent drying, which can cause building foundations to crack.

Onsite wastewater treatment system (OWTS; septic system) tanks are not typically installed for use during construction. Rather, wastewater generated by construction is usually limited to that generated by construction personnel, which is typically accommodated by portable toilets emptied into municipal sewage or septic systems offsite. However, for projects that include installation of an OWTS, improper siting of this system could result in adverse environmental impacts. Soils incapable of supporting the wastewater load to a septic system would result in daylighting of wastewater at the ground surface.

Construction of new or modified facilities that require blasting could trigger landslides on unstable slopes and expose construction workers or members of the public to the risk of injury or death.

Geology and soils impacts associated with common construction activities and siting would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-GEO-a–e: A (CMM-GEO-a–e). Mitigation can include designing project construction to prevent erosion and sedimentation; implementing soil and erosion control BMPs for all stages of construction and operation (as applicable) as part of a site-specific SWPPP; and implementing site-specific geologic and geotechnical investigations to address the potential for liquefaction, subsidence, groundshaking, and slope failure. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-GEO-a–e: B–D can avoid or reduce additional potentially significant impacts on geology and soils associated with new or modified facilities. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, impacts cannot be determined with certainty at this time. Therefore, potential impacts on geology and soils remain potentially significant.

Reservoirs and Points of Diversion

Effects related to geology and soils associated with the siting and construction of reservoirs and points of diversion could occur (see *Common Construction*). If water storage and diversion facilities are not properly sited and designed, lateral spreading, subsidence, liquefaction, or collapse could occur; and dams, intake structures, and other related constructed facilities could fail. Dams, points of diversion, and other constructed facilities (e.g., water conveyance pipelines) located near active faults could be damaged or fail if exposed to surface fault rupture or strong seismic ground shaking. Seismic-related ground shaking can cause vibrations in dams, dam foundations, and appurtenant structures. Structural distortions in a dam foundation can result from fault movements. Failure of a dam could result in injury or loss of life and uncontrolled releases of water, flooding, and disruption of water supply deliveries. Dams, points of diversion, and other constructed facilities could be susceptible to liquefaction and lateral spread if underlain by unstable geologic unit(s) or soil. Operation of a new reservoir could result in the formation of surface springs and seeps in adjacent areas due to leakage. This could result in the creation of areas of unstable soils and could result in landslides, lateral spreading, subsidence, liquefaction, or collapse. Considering that reservoirs draw people to an area for recreation, structural failures and landslides would place not only the surrounding community at risk but also nearby recreationists. Where reservoir storage capacity may be increased by increasing the height of an existing dam, the potential area of effect would extend to the entire reservoir perimeter and its higher elevation. The new dam elevation would have potential to increase landslides along the perimeter due to repeated soil saturation and draining as the reservoir levels fluctuate.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-GEO-a–e: B would minimize or avoid geology and soils impacts associated with reservoir and point of diversion projects. This mitigation measure includes conducting site-specific geotechnical investigations for dam foundations and reservoir rim and feasibility studies to evaluate geologic site conditions (e.g., slope stability) prior to construction. This mitigation measure also includes adhering to applicable design and operating guidelines and requirements for dam embankments, foundations, abutments, and appurtenant facilities and includes implementing a sediment management and monitoring plan. Until mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery

Groundwater well development and groundwater storage and recovery projects could result in impacts related to geology and soils primarily if site-specific conditions are not considered prior to construction (see *Common Construction*).

Improper siting of a groundwater extraction well or injection well could subject the well and/or associated facilities (e.g., conveyance infrastructure for groundwater extraction wells) to seismic and geologic hazards. Soil liquefaction occurs primarily in areas saturated with high groundwater levels and cohesionless soils (e.g., sandy or coarse-grained) (Jackson 2020; Chung and Rogers 2013). If a groundwater extraction or injection well were located in an area susceptible to liquefaction, the well and associated facilities (e.g., any conveyance infrastructure) could be damaged during a seismic event. Similarly, if either passive or active recharge projects were sited in an area with poorly consolidated geologic materials, recharge could create a shallow water table, making the area prone to liquefaction. If groundwater wells and/or associated water conveyance infrastructure were located in an active fault zone, an earthquake of sufficient magnitude could cause structural damage to these facilities but would be unlikely to result in injury or loss of life for people present.

Once operational, new passive groundwater storage and recovery projects have the potential to result in substantial soil erosion and/or the loss of topsoil if recharge water diverted from surface water sources is applied to the recharge area at a rate that is too high (i.e., high-flow velocity) or in a volume that is too large such that applied water cannot percolate into the underlying aquifer fast enough and runoff results.

These impacts would be potentially significant. Implementation of project siting and design measures and site-specific geotechnical investigations could reduce impacts related to geologic and seismic hazards. In addition, as discussed in more detail below, implementation of Mitigation Measure 7.22 MM-GEO-a–e: C would avoid or reduce the potential for erosion and/or loss of topsoil due to operation of passive groundwater storage and recovery projects. Further, as part of this mitigation measure, wells would be designed to meet DWR's well standards, which would reduce the potential for structural damage to groundwater wells due to seismic hazards. Until mitigation measures are implemented, the impacts remain potentially significant.

Section 7.9, *Geology and Soils*, evaluates the operational effects on geology and soils due to increased groundwater pumping and groundwater storage and recovery and presents any applicable mitigation measures to minimize or avoid these effects.

Once constructed, groundwater wells would not expose people to substantial adverse effects (including the risk of loss, injury, or death) from earthquake fault rupture, strong seismic ground shaking, seismic-related ground failure, or landslides. Groundwater supply wells extract groundwater at depth and do not exacerbate potential effects related to earthquakes, ground shaking, liquefaction, or landslides; groundwater extraction generally occurs below the depth where liquefaction, ground shaking, and landslides could be affected.

For passive groundwater storage and recovery, recharge, water can be kept in canals and agricultural fields to allow water to percolate into an underlying aquifer. Siting of agricultural canals would avoid areas known to have an earthquake fault, experience strong seismic ground shaking, experience seismic-related ground failure, or experience landslides. Additionally, changing the volume of water in a canal or on agricultural land would not affect or be affected by any seismic hazards or landslides. Surface water flows that could result in soil erosion would not be released

into the canals or agricultural fields, and the water released would be of an appropriate volume and timing to allow for groundwater recharge. Therefore, erosion and runoff are unlikely to occur. Once operational, agricultural canals and fields would not expose people to substantial adverse effects (including the risk of loss, injury, or death) from earthquake fault rupture, strong seismic ground shaking, seismic-related ground failure, or landslides because the canals would not draw people to earthquake areas or geologic hazard locations not already frequented. Although modification of these facilities could take place in areas where potential geologic hazards exist, these modifications to existing infrastructure would not draw people to earthquake areas or geologic hazard locations not already frequented.

Water Treatment Facilities

Potential impacts related to soil and erosion from construction of water treatment facilities are described above (see *Common Construction*).

Depending on the location, water treatment facilities (including desalination plants) can be affected by rupture of a fault, strong seismic shaking, or seismic-related ground failure/liquefaction, or landslides. Locating new treatment facilities on or near an Alquist-Priolo Earthquake Fault Zone or an area prone to either strong ground shaking or ground failure could result in failure or collapse of the structure. Moreover, locating a new water treatment plant in an area with expansive soils could result in cracked or shifting foundations and other structural damage. Surface fault rupture, strong ground shaking, or ground failure could result in substantial damage to water conveyance pipelines associated with water treatment facilities (including desalination and recycled water treatment facilities), which in turn, could cause damage nearby non-project facilities (e.g., as a result of flooding). Much of the coast of California is seismically active; potential risks include soil erosion, significant ground motion, liquefaction, and landslides. Many coastal areas are underlain by formations of low strength where precipitation-induced landslides are frequent in the coastal hills and bluffs. Accordingly, improper siting of ocean desalination facilities could expose people or structures to potential substantial adverse effects. These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-GEO-a–e: D requires consultation with the California Coastal Commission during the design and siting phases for ocean desalination projects. Until mitigation measures are implemented, the impacts remain potentially significant.

Drinking water treatment plants that include groundwater wells could result in the impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*).

Other Construction Projects

Potential geology impacts associated with the siting and construction of other construction projects are described above (see *Common Construction*).

Once constructed, stream gages and canal lining would not expose people to substantial adverse effects (including the risk of loss, injury, or death) from earthquake fault rupture, strong seismic ground shaking, seismic-related ground failure, or landslides because they would not draw people to earthquake areas or geologic hazard locations not already frequented. Except for occasional routine maintenance, stream gage operations do not require people to be present at these facilities.

Mitigation Measures

7.22 MM-GEO-a–e: Mitigate geology and soils impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction GEO Mitigation Measures (CMM-GEO-a–e)

1. **Regulatory Compliance:** Comply with existing federal, state, and local geotechnical regulations; water quality regulations; building codes (including the current approved version of the International Building Code and the California Building Standards Code); standards; specifications; zoning; and the site-specific recommendations of a geotechnical study prepared for the project.
2. **Project Siting and Design:**
    i. Locate projects away from areas with unsuitable soils or steep slopes.
    ii. During preliminary project design, a detailed site-specific geotechnical investigation of the project area will be performed/prepared by a certified engineer. The geotechnical investigation will include, but not necessarily be limited to, assessment of liquefaction potential, bearing strength of soils, and seismic hazards (including fault displacement). Based on results from the geotechnical investigation, project design measures will be developed and incorporated into the final project design to address any adverse geologic, seismic and/or soil conditions (e.g., expansive soils). The geotechnical investigation will follow industry standard of practice and use American Society for Testing and Materials standards, where applicable.

        Design measures will conform to applicable design codes, guidelines, and standards. At a minimum, the investigation will evaluate the soil potential for expansion, lateral spreading, subsidence, liquefaction, or collapse.
    iii. The lead agency will ensure that findings/recommended design measures from the site-specific geotechnical investigation are incorporated into project design and siting to avoid potential adverse seismic effects and adverse soil conditions. The lead agency will ensure that the design specifications are properly executed during construction.
3. **Assurance of No Fault Traces:** A licensed practitioner will certify that no fault traces are present within the footprint of any building intended for human occupancy to be constructed within the Alquist-Priolo Special Studies Zone.
4. **Geology and Soils Management Measures:** Design, implement, and maintain site-specific measures as recommended by a qualified geotechnical professional in areas susceptible to landslides, lateral spreading, subsidence, liquefaction, or collapse.
    i. Implement ground improvements such as soil compaction and excavation and disposal of liquefiable soils.
    ii. Implement structural improvements, such as berms or dikes, to prevent large lateral spreading.
    iii. Stabilize areas susceptible to landslides with buttress fills or other appropriate measures.

iv. Install special drainage devices and water injection wells.

v. Monitor groundwater level to ensure stable soil conditions.

5. **Construction WQ Mitigation Measures**: **Regulatory Compliance** (CMM-WQ-a–j: 1) and **Erosion Control, Sedimentation Control, and Soil Stabilization Measures** (CMM-WQ-a–j: 3)

6. **Septic System Management Measures**: Mitigate impacts associated with soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

   i. Comply with all provisions of the state's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (^SWRCB 2012), as implemented by the applicable regional water board or local county agency in which construction and operation of a septic system is proposed. The design, site evaluation, siting, construction, installation, and operation of the OWTS will be required to comply with all applicable minimum standards.

   ii. Comply with all provisions of the applicable codes for the county or counties in which construction and operation of a septic system is proposed, including the design and installation of septic systems.

   iii. Comply with Health and Safety Code sections 117400–117450, and any other applicable county code regarding cleaning septic tanks, chemical toilets, cesspools, and seepage pits.

7. **Blasting Operations and Safety Plan:** Prior to construction, a blasting operations and safety plan will be prepared and will identify BMPs to be implemented prior to, during, and following any blasting activities to minimize the potential for blasting-related hazards. These BMPs include the following.

   i. The transport and use of explosives for blasting will be conducted according to applicable regulations (e.g., Cal. Code Regs, title 8, article 115, *Transportation of Explosives*, and article 116, *Handling and Use of Explosive Materials in Blasting Operations*) and permits.

   ii. Implement measures to avoid potential hazards related to flyrock, such as the following.

      - Accurately measure the burden for each blast hole and be aware of the true burden for each hole along the free faces.
      - Use adequate stemming and stem through incompetent zones. Use crushed stone for stemming.
      - Place primer lower in the hole, increase delays between rows, reduce burden in back rows.

   iii. Implement measures to minimize fugitive dust due to blasting operations, such as the following**.**

      - Conduct blasting on calm days when wind conditions are suitable (e.g., no strong winds blowing toward sensitive receptors). Wind direction with respect to the nearby residences and other receptors will be considered.

- Wet ground prior to blasting.
- Install wind fence(s) for control of windblown dust.

iv. Implement safety measures to prevent personal injury and fire related to the use of explosives. At a minimum, these measures will include the following.

- Limit blasting activities to daylight hours.
- Notify occupants of nearby buildings, stores, residences, places of business, and places of public gathering at least 48 hours in advance of blasting.
- Use a signaling system to alert workers of an impending blast.
- Do not locate explosive materials where they may be exposed to flame, excessive heat, sparks, or impact.
- Conduct all blasting work in compliance with all pertinent fire prevention laws.

v. Avoid blasting in potential rockslide/landslide areas and consult with a geologist prior to blasting in such areas.

vi. Implement BMPs to reduce short-term noise and vibration impacts.

8. **Protect Agricultural Soils** (CMM-AG-a-e: 4)

B. Reservoirs and Points of Diversion GEO Mitigation Measures

1. **Regulatory Compliance:** Comply with existing regulatory requirements for the design and construction of new dams or the modification of existing dams. Under California Water Code, Division 3, Chapter 5, Article 1 (New Dams and Reservoirs or Enlargements of Dams and Reservoirs), applicants must provide DWR, Division of Safety of Dams (DSOD) information about the location, type, size, height, storage capacity, and hydrologic conditions related to the dam.

2. **Project Siting and Design for New or Modified Reservoirs:** Dam foundations, abutments, and appurtenant facilities will adhere to applicable design and operating guidelines and requirements, which include the following.

i. ASTM International C33 (2018) (standard specifications for aggregate for filters and drains and aggregate use in structural concrete).

ii. DSOD Emergency Drawdown Criteria (DWR 2018).

iii. DSOD standards and design review requirements for jurisdictional dams (DWR 2018).

iv. International Building Code (IBC) (2018). Chapter 16, *Structural Design*.

v. USACE 1997 Tunnels and Shafts in Rocks, EM-2-1110-2901.

vi. USACE 2000 Roller-Compacted Concrete, EM 1110-2-2006.

vii. USACE 2003 Slope Stability, EM 1110-2-1902.

viii. USACE 2005 Stability Analysis of Concrete Structures, EM 1110-2-2100.

ix. USACE 2018 Hydrologic Engineering Center, HEC-HMS Hydrologic Modeling System, Version 4.3.

x. Reclamation 1987 Design of Small Dams.

xi. Reclamation 1989 Flood Hydrology Manual, First Edition.

xii. Reclamation 2011 Design Standards No. 13, Embankment Dam Design Standards, Chapter 4, *Static Stability Analysis Phase 4* (Final).

xiii. Reclamation 2011 Design Standards, No. 13, Embankment Dam Design Standards, Chapter 5, *Protective Filters Phase 4* (Final).

xiv. Reclamation 2016 USBR Design Standards No. 6, Hydraulic and Mechanical Equipment, Chapter 12, *Trashracks and Trashrack Cleaning Devices*.

xv. Reclamation 1989 Flood Hydrology Manual.

3. **Geotechnical Investigations for Dam Foundation and Reservoir Rim:** For new reservoirs, conduct geotechnical investigations, including a seismic hazards study, for reservoir dam(s) and reservoir rim to provide project-specific recommendations for the engineering and final design of all facilities. The investigations for the dam(s) would include geologic reconnaissance and mapping, assessing subsoil and foundation conditions and behavior, physical tests to measure in place the properties and behavior of foundation materials at the dam or reservoir site, and fault trenching. *In situ* testing would also be conducted and would include downhole geophysics, packer testing, and dilatometer use. Piezometers would be installed at select locations to collect data on groundwater depth. These investigations will be adequately distributed over the potential dam site. In addition, laboratory testing of foundation material will be performed and may include, but not necessarily be limited to, tests such as direct shear, unconfined and triaxial compression, sliding friction, tensile strength, natural and dry density, moisture content, grain-size analysis, and consolidation. An analysis of site-specific probable and credible seismic acceleration values, in accordance with current applicable standards of care, will be performed to provide for suitable project design. In addition, as part of the geotechnical investigations the potential for seeps and springs to develop in areas adjacent to the proposed improvements will be identified and quantified, and appropriate mitigation will be developed and implemented to control seepage. Mitigation of such seepage could include, without limitation, additives to concrete that reduce its permeability, construction of impervious liner systems, and design and construction of subdrainage (passive control) or dewatering systems (active control). Geotechnical investigations for the reservoir rim would include geologic mapping, geophysical investigations, borings, and *in situ* testing (including downhole geophysics and packer testing). The objective of the investigations related to the reservoir rim would be to evaluate seepage and stability. Hydrogeological/geotechnical investigation will be performed by a licensed professional engineer or geologist.

4. **Feasibility Studies:** Evaluate geologic site conditions, including slope stability of the abutments and upstream embankment slopes; streambank stability, determination of the erosion resistance of the dam abutments and foundation for flood flows, subsurface explorations for the design of potential diversion channels or tunnels, and estimation of foundation permeability and groundwater levels for dewatering the site excavations. Potential earthquake loadings and seismic stability will be considered for the retention of any large tower-like structures. Incorporate into engineering designs and construction any special accommodations for geological resources and worker safety.

Design the reservoir drawdown rate to avoid inducing any potential landslides along the reservoir margins or a slope failure of an embankment dam. Proceed with project if feasibility analysis verifies that constructing or operating a project will not result in unacceptable consequences.

5. **Sediment Management and Monitoring Plan:** A sediment management and monitoring plan will be required to provide for the natural erosion, or handling and disposal, of both coarse- and fine-grained materials where the impoundment contains large quantities of sediment. During, and for an appropriate period following reservoir drawdown, potentially unstable areas within a reservoir footprint will be monitored for slope instability. If slope failure is observed, an exclusion zone will be established around the unstable area and the areas will be monitored. Slope stabilization measures will be implemented as appropriate. Potential impacts can be offset through appropriate actions such as engineering structural slope improvements (e.g., drilled shafts or other structural elements that could be installed to resist slope movement) and revegetation of affected areas. The plan must provide for removal and/or remediation of unstable or expansive soils as appropriate.

C. Groundwater Wells and Groundwater Storage and Recovery GEO Mitigation Measures

1. **Project Design for Passive Recharge**: To avoid soil erosion during fill and/or due to overflow of passive recharge facilities (e.g., recharge ponds, infiltration basins), project design elements will include, but not necessarily be limited to, the following.
   i. Consideration of site conditions, including soils (e.g., soil texture or classification should be conducive to infiltration), seasonal high groundwater elevation, and topography.
   ii. Design recharge pond, infiltration basin, spreading grounds or equivalent to completely drain between fill events.
   iii. Include energy dissipators at inlet and outlet.
2. **Regulatory Compliance** (7.22 MM-WQ-a–j: C3) for groundwater wells.

D. Water Treatment Facilities GEO Mitigation Measure

1. **Coordination with the California Coastal Commission:** During project siting and design phases, project managers will consult with the California Coastal Commission to help anticipate and avoid any geologic hazards.

7.22.2.8 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VIII. Hazards and Hazardous Materials				
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	☒	☐	☐	☐
c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	☒	☐	☐	☐
d.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	☒	☐	☐	☐
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area	☒	☐	☐	☐
f.	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area	☒	☐	☐	☐
g.	Impair implementation of or physically interfere within an adopted emergency response plan or emergency evacuation plan	☒	☐	☐	☐
h.	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	☒	☐	☐	☐

Section 7.11.2, *Environmental Setting*, describes the hazards and hazardous materials setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Depending on the location, construction of new or modified facilities could emit hazardous emissions or require the handling of hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school; be located on a hazardous materials site and create a significant hazard to the public or the environment; or be located within an airport land use plan or within 2 miles of a public or public use airport, or in the vicinity of a private airstrip, and result in a safety hazard for people residing or working in the project area. In addition, construction projects could impair implementation of or physically interfere with an adopted emergency response plan or

emergency evacuation plan or expose people or structures to a significant risk of loss, injury or death involving wildland fires.

Construction activities could require the transport, use, or disposal of hazardous materials (e.g., fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, paint, paint thinner); therefore, project construction could result in accident conditions involving the release of hazardous materials, which could result in a significant hazard to the public or the environment. Most heavy construction equipment requires petroleum products such as fuel, oil, and hydraulic fluid for effective operations. Equipment refueling is required daily for most heavy construction equipment, and oil and hydraulic fluid changes and replenishment are required periodically. Generally, service trucks deliver these types of hazardous fluid onsite where fuel and oil transfers occur. Onsite refueling and equipment maintenance could result in the accidental release of hazardous materials. In addition, if equipment is not properly maintained or if onsite construction-related hazardous materials are improperly stored, leakage and inadvertent spills could occur, respectively.

Construction activities also could include excavation. Excavation could disturb areas with existing soil or groundwater contamination or could occur on an unrecorded hazardous material site. Where construction projects may require demolition of existing structures, adverse impacts could result if construction activities inadvertently dispersed contaminated material into the environment, such as asbestos or lead-based paint from existing building materials or stored liquid paints, solvents, and household or industrial-strength maintenance chemicals and cleaners, which could adversely affect construction workers or others in the vicinity of the construction activity or the environment. In addition, construction activities on a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese site) could also spread existing soil or groundwater contaminants if the activity includes substantial excavation. Further, existing underground infrastructure (e.g., natural gas pipelines, utility lines) within a project area could be encountered during excavation and could result in hazards to the public or environment if damaged. In areas where *Coccidioides* fungus is endemic, disturbance of soils containing *Coccidioides* spores may expose workers and people adjacent to the construction site to these fungal spores in fugitive dust, as discussed in Section 7.22.2.3, *Air Quality*.

Additional construction-related hazards may result from the use of explosives. Construction could require the use of explosives in blasting to break up bedrock within the project footprint. Blasting could pose a hazard to project construction workers as well as the public. The fragments of rock thrown and scattered during blasting, known as “flyrock,” can be cast thousands of feet from a blast and can result in injuries and fatalities (OSMRE n.d.). The presence of explosive materials on a project site could increase the risk of fire during construction. If a project were adjacent to or relatively close to wildlands, people or structures could be exposed to a substantial risk of property loss, personal injury, or death due to a wildland fire.

Some new or modified facilities may include installation of underground or aboveground storage tanks (USTs and ASTs, respectively) for bulk fuel storage. Faulty installation or inadequate operation and maintenance of USTs or ASTs may result in the release of fuel, which could result in surface water and groundwater contamination or other adverse effects (including the potential for fire and explosion). In addition, improper siting, construction, or maintenance of public restrooms could expose the public to raw sewage, which would be a public health hazard. Similarly, for projects that include installation of a septic system, improper siting of this system could result in daylighting of wastewater at the ground surface.

Construction activities could occur within 0.25 mile of a school. The release of hazardous material, potentially exposing school children and staff, could result if materials became air-borne, (e.g., gases, asbestos particles) or could occur through ignition of flammable liquids or vapors. Construction could also expose school occupants within 0.25 mile of the construction and haul corridors to the potential of accidental hazardous materials spills.

Depending on their location, construction activities have the potential to temporarily impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan by impairing the access of emergency response services to a location or interfering with emergency evacuation by rerouting traffic during construction, for example (see discussion in Section 7.22.2.16, *Transportation and Traffic*). Although some construction projects may not directly conflict with an adopted emergency response plan or emergency evacuation plan, these projects could create a situation that requires additional need for emergency service providers due to accidental releases of hazardous materials, worksite fires, and vehicular accidents due to construction-related changes in traffic, for example.

Construction could involve the use of electrical or gas-powered equipment, and flammable materials (e.g., fuels and solvents) and could involve activities that could start a wildfire, depending on the project location. For example, solvents used on site for maintenance of heavy equipment could be inadvertently ignited by sparks from equipment/machinery or lit cigarettes of construction crew members if proper safety measures were not implemented. In addition, fires could be caused by other construction-related activities, including welding or parking and starting heavy equipment or vehicles on dry grass. If a project were adjacent or relatively close to wildlands, people or structures could be exposed to a substantial risk of property loss, personal injury, or death due to a wildland fire resulting from these types of construction hazards.

Airspace safety hazards occur when project components, such as buildings or construction equipment, encroach on the airspace of an airport runway. Construction occurring in proximity to an airport or a private airstrip that requires the use of equipment with a vertical reach of 200 feet or more (e.g., a tower crane) or a helicopter could result in a safety hazard for people residing or working in the project area. A helicopter may be used in construction as an "aerial crane" to lift and place heavy loads (e.g., rooftop unit installations) and transport cargo more efficiently. Helicopters may also be used in utility construction projects in "stringing" transmission lines.

Construction could create new disease vector habitat that could pose a significant public health hazard. Mosquitoes require standing water to complete their growth cycles, and any body of standing water that remains undisturbed for multiple days can be a potential mosquito breeding site. Stagnant ponded water could be created at construction sites following a rainstorm. Ponding areas that do not dry for several days can potentially create temporary mosquito habitat if water ponding occurred when ambient temperatures are relatively warm (i.e., spring through fall). In addition, to comply with stormwater permit requirements, construction contractors may create drainage ditches and subsequent retention ponds to prevent stormwater runoff from entering nearby waterbodies, which could also provide breeding habitat for mosquitoes. Mosquito control may require application of pesticides.

Hazards and hazardous materials impacts associated with siting and common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-HAZ-a–h: A (CMM-HAZ-a–h). Mitigation of construction-related hazards and hazardous materials impacts can include preparation of environmental site assessments,

preparation and implementation of an emergency response plan, a fire prevention and management plan, and a spill prevention and response plan. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-HAZ-a–h: B–H can avoid or reduce additional potentially significant hazards or hazardous materials impacts associated with new or modified facilities. If these mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, impacts related to hazards cannot be determined with certainty at this time. Therefore, the potential impacts related to hazards and hazardous materials remain potentially significant.

Water quality control and flood risk are evaluated in Section 7.22.2.9, *Hydrology and Water Quality*.

Reservoirs and Points of Diversion

Reservoir and point of diversion projects can range from small projects (e.g., simple relocation of an existing diversion structure) to large projects (e.g., constructing a new dam and reservoir). Hazards and hazardous materials associated with these projects are related to the size of the project, as well as the magnitude and duration of instream construction required. Depending on the type and size of the project, construction activities could take place over several years and would include major excavation activities—particularly for the dam and inundation footprint for new reservoirs, as well as tunneling, trenching, surface water and groundwater dewatering, quarrying, potentially demolition, and other activities. Many of the associated construction impacts for small reservoir and diversion projects can be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

For larger dam and diversion projects, extensive analysis and evaluation are required before any construction occurs because of likely long-term significant impacts associated with hazards and hazardous materials. New or modified reservoir and diversion projects could result in prolonged construction-related impacts consisting of an increase in traffic on narrow rural roads from commuting workers, hauling of large equipment, and disposal of wastes. Construction-related footprint excavation or expansion, increasing the height of a dam, or building a new dam would potentially be the period of highest construction intensity and therefore would require the largest workforce and number of worker vehicle trips and haul truck trips. This additional traffic could temporarily result in interference with an adopted emergency response plan or emergency evacuation.

Dredging may be required for expansion of an existing reservoir and for construction of new points of diversion. This could involve removal of contaminated sediment, which could accidentally be released to areas and surface waters outside the reservoir in the process of upland placement for drainage/dewatering, for example (see Section 7.22.2.9, *Hydrology and Water Quality*). If not suitable for use, dredged sediment may require transport to and disposal in a hazardous waste disposal facility.

Operation of reservoir facilities and some points of diversion could require the use of petroleum-based lubricants for lubrication of machinery and other potentially hazardous materials, such as solvents and paints for ongoing facility maintenance. These types of materials are not acutely hazardous if used properly and would likely not be used or stored on site in large volumes. Chemical control of mosquitos and invasive terrestrial or aquatic vegetation in new reservoirs, if required, could result in the accidental release of herbicides or pesticides and exposure of the application crews and general public (including schools within 0.25 mile) to herbicides. Misuse or an

accidental spill of an herbicide or pesticide could also adversely affect aquatic and terrestrial species and habitat, as well as water supplies, depending on the amount and type of chemical spilled, the location of the spill, weather conditions, and emergency response time (e.g., cleanup). Once constructed, some projects may require the use of hazardous materials for operations and maintenance (e.g., herbicide control of invasive weeds as part of landscape maintenance, pesticide for control of mosquitoes). Improper use or storage of herbicides could result in exposure of the application crews and general public (including children, for sites located within 0.25 mile of a school) to toxic chemicals.

As discussed in Section 7.22.2.9, *Hydrology and Water Quality*, HABs (e.g., cyanobacterial blooms) may form in new reservoirs, particularly during the initial filling. Cyanobacterial blooms can release toxins (cyanotoxins) that are hazardous to humans and are therefore a concern for recreational waters and municipal and domestic water supplies (specifically drinking water). In addition, the relatively abundant organic carbon from newly inundated soils and vegetation in a new reservoir or in newly inundated areas in an expanded reservoir (e.g., by increasing dam height) can stimulate bacterial methylation of mercury that may be present in soils from atmospheric deposition or naturally mercury enriched areas, for example. Because mercury is bioaccumulative, tissue methylmercury levels in reservoir fish and potentially in fish downstream of the reservoir may increase measurably. Bioaccumulation would be greatest in larger, older piscivorous fish (i.e., top predators). Consumption of these fish would result in exposure to mercury.

Reservoirs constructed close to an airport could potentially create a safety hazard for people (e.g., recreationists) by placing them in proximity to hazards associated with airport operations. Although the highest concentration of aircraft accidents occurs within approximately 1,500 feet of the end of a runway, a significant number occur within an area extending about 2 miles beyond the runway end (Caltrans 2011). Reservoirs near airports could also be a source of light or glare that may interfere with airport operations. In addition, construction of a reservoir in proximity to an airport could indirectly adversely affect aircraft safety by increasing the potential for collisions between aircraft and waterfowl attracted to the open water of the reservoir. This could create a potential safety hazard for people residing or working in or near the project area.

New reservoirs, reservoirs with an expanded footprint, and new points of diversion could create conditions favorable to mosquitos, which could lead to increased transmission of mosquito-borne diseases (e.g., West Nile virus). Generally, waterbodies with poor circulation, continual slow-changing water levels, and higher temperatures provide favorable mosquito breeding habitat. Relatively shallow surface water, as may occur at a reservoir shoreline or at surface sedimentation/drying basins, which may be required by large surface water intakes, can provide suitable breeding habitat for mosquitos. Dense vegetation and slow-moving water, as can occur around the shoreline of a reservoir, can increase the numbers of mosquitoes produced. Sedimentation basins may be constructed at large diversions; depending on the design (e.g., water depth and circulation), these basins may provide suitable breeding conditions for mosquitoes.

New reservoirs may be located near wildlands. Recreationists at new reservoirs may cause an increased risk for wildfire in the area, particularly where use of fire pits and grills are permitted. Cars at new reservoirs could also contribute to wildfire risk; hot exhaust pipes and mufflers can ignite dry grass or brush with sustained contact. In addition, maintenance activities could involve the use of electrical or gas-powered equipment (e.g., for landscape maintenance) and flammable materials such as fuels, which could start a wildfire. Thus, new reservoirs may indirectly expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-HAZ-a–h: B–F would minimize or avoid potentially hazardous impacts on the public or environment from reservoir projects and points of diversion. Mitigation would include appropriate storage of hazardous materials; implementation of a hazardous materials accidental spill response plan; implementation of a wildfire prevention plan; ensuring project compatibility with airport land use compatibility plans for new reservoirs within 2 miles of a public airport; and implementation of mosquito control measures, including safe pesticide application. In addition, the spill prevention, response, and cleanup procedures (CMM-HAZ-a–h: A1) would minimize potential hazardous materials impacts on stormwater related to accidental spills and leaks. Implementation of Mitigation Measure CMM-GEO-a–e: 7 would ensure regulatory compliance related to the transport and use of explosives for blasting and would minimize potential hazards related to blasting for construction of new reservoirs. Mitigation Measure 7.22 MM-WQ-a–j: B provides for mitigation for potential water quality impacts from reservoirs and points of diversion. Until mitigation measures are implemented, the impacts remain potentially significant.

A new reservoir could flood a roadway designated in an emergency response plan or evacuation plan. An existing reservoir undergoing modifications would already be included in these plans. These plans are updated on an ongoing basis, and sufficient time would be available to address changes to the plans for a new or modified reservoir. Therefore, new or modified reservoirs would not likely interfere with an emergency response plan or evacuation plan.

Groundwater Wells and Groundwater Storage and Recovery

Potential hazards posed to the public or environment due to construction of agricultural or municipal groundwater wells and associated distribution systems would involve earthmoving or excavation and drilling that could require the use or transport of hazardous materials, generate dust, or disturb existing unknown soil or groundwater contaminations (see *Common Construction*). Groundwater well development sites generally would be smaller than other water supply facilities (e.g., reservoirs, water treatment facilities). Accordingly, construction timeframes would be shorter, ground disturbance would be relatively limited, and likely smaller quantities of potentially hazardous materials would be present onsite as part of construction.

Groundwater well maintenance may require the use of hazardous materials, with the potential for accidental release of these materials into the environment. Operation of new municipal groundwater wells may use a disinfection system, which could require routine transport, use, and storage of hazardous materials such as chlorine gas, sodium hypochlorite, or ammonia. These chemicals are commonly used by water purveyors to disinfect groundwater prior to release in the distribution system to aid in compliance with safe drinking water standards. Operation and maintenance of municipal groundwater wells could result in localized spills of these chemicals if improperly handled or stored. Depending on the location of new municipal groundwater wells, these hazardous materials could be used within 0.25 mile of a school; municipal groundwater wells would likely be within urban and suburban areas to serve existing water users. Similarly, groundwater storage and recovery projects that treat surface water and inject the water into the aquifer could use water treatment chemicals, such as hypochlorite, which may also be stored on site. Operation of a new municipal groundwater well could require on-site treatment and removal of water pollutants (e.g., arsenic) through use of granular-activated carbon (GAC) filters, for example, which could require transportation and potentially disposal of hazardous waste. Both municipal and

agricultural groundwater wells may require the use of diesel-powered pumps. Diesel fuel, hydraulic oil, and other potentially hazardous materials would be used in conjunction with these pumps.

Standing water in groundwater recharge ponds or spreading basins could attract mosquitos as these areas could provide breeding habitat for these insects. This could ultimately result in increased transmission of mosquito-borne diseases (e.g., West Nile virus) in the area.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-HAZ-a–h: B–D and G1 would minimize or avoid potentially hazardous impacts on the public or environment related to the storage and use of hazardous materials in the operation of municipal groundwater wells, as well as the potential for an increase in vector-borne diseases related to groundwater recharge ponds and spreading basins. Mitigation Measure 7.22 MM-HAZ-a–h: A1 includes measures for the safe transport, use, and disposal of hazardous materials, which would also reduce or avoid any related hazardous materials impacts during operation and maintenance. Mitigation Measure 7.22 MM-WQ-a–j: C addresses water quality control for groundwater wells and groundwater storage and recovery. Until mitigation measures are implemented, the impacts remain potentially significant.

Water Treatment Facilities

Potential hazards posed to the public or environment from construction of water treatment facilities are described in *Common Construction*. In addition, operation of water treatment facilities would require the transport, use, storage, and disposal of hazardous or potentially hazardous chemicals such as liquid chlorine or chlorine gas, liquid sodium hypochlorite, ammonia, and sodium hydroxide. These hazardous materials are commonly used by water treatment facilities during the treatment process to comply with effluent discharge standards; they are considered corrosive and represent inhalation, ingestion, and contact hazards. Further, for facilities including reverse osmosis treatment, reverse osmosis membrane cleaning chemicals would be stored on site. These chemicals are used to remove organic and inorganic substances that foul membranes; they include sodium hydroxide (high pH) and hydrochloric acid or sulfuric acid (low pH), respectively. Given that water treatment and reverse osmosis membrane cleaning chemicals are used regularly at water treatment facilities, these chemicals are typically stored in large, potentially "reportable" quantities on site (Health and Safety Code, title 27, division 20, chapter 6.95, section 25503.5). In addition, water treatment chemicals, paints, paint thinner, lubricating oils, solvents, diesel fuel (for emergency backup electricity generators), compressed oxygen gas, and herbicides may be stored on site for use in operation and maintenance of the facility or facility grounds. Improper storage or use of any on-site hazardous materials or improper transport or disposal of hazardous materials related to operation of new or modified water treatment facilities could result in adverse effects on the public or environment via inadvertent release. Improper onsite access/service road design for new water treatment facility projects could result in chemical delivery truck accidents and the consequent release of hazardous materials. Hazardous waste may be generated as part of the water treatment process (e.g., potentially spent GAC filters, depending on the source water), which would require disposal at an approved facility. Because water treatment facilities could be located in urban and suburban service areas and therefore could be sited within 0.25 mile of a school, school occupants could be exposed to hazardous materials (e.g., accidental release of chlorine gas).

If the new or modified water treatment facility was located adjacent to wildlands, improper storage or use of chemicals or use of some equipment could expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Improper storage or use of flammable or

combustible chemicals or incompatible chemicals may present a fire or explosion and/or fire risk. In addition, maintenance activities could involve the use of electrical or gas-powered equipment (e.g., for landscape maintenance), which could potentially start a wildland fire, depending on the location of the facility.

Water treatment facilities generate solid waste in the form of water treatment sludge and sewage sludge,[3] respectively. WWTPs also produce "biosolids," which is treated sewage sludge that meets the USEPA's pollutant and pathogen requirements for land application and surface disposal (USEPA 2022). Biosolids can be managed in several ways, including disposal in a sanitary landfill or a dedicated biosolids landfill, incineration, and landfill cover. In some cases, biosolids can be used as a soil amendment for agriculture, silviculture, and land reclamation; for example, depending on the concentrations of certain pollutants including heavy metals (i.e., arsenic, cadmium, copper, lead, mercury, nickel, selenium, zinc) and pathogens, pursuant to 40 C.F.R Part 503 (SWRCB 2004) .

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-HAZ-a–h: B–D and H would minimize or avoid potentially hazardous impacts on the public and environment related to water treatment facilities. Mitigation would include appropriate storage of hazardous materials, implementation of a hazardous materials accidental spill response plan, implementation of a wildfire prevention plan, safe and appropriate use of herbicides and pesticides, implementation of a Hazardous Materials Business Plan, and appropriate design of onsite access and service roads to ensure the safe transport of hazardous materials to the treatment facility. In addition, Mitigation Measure 7.22 MM-WQ-a–j: D addresses water quality impacts, including the use or disposal of sewage sludge. Until mitigation measures are implemented, the impacts remain potentially significant.

Drinking water treatment plants that include groundwater wells could result in the impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*).

Other Construction Projects

Potential hazards posed to the public or environment from construction of new or modified boat ramps, stream gages and other monitoring devices, and irrigation canal lining projects would be primarily associated with construction. These impacts and mitigation measures to avoid or minimize potential impacts are described in *Common Construction*. The smaller scale of boat ramp projects as well as stream gage and other monitoring device projects would mean shorter construction timeframes, fewer heavy construction vehicles, and use of smaller quantities of potentially hazardous materials relative to larger projects like new or modified reservoirs, new water treatment facilities and desalination facilities.

Long-term impacts from new or modified boat ramps, stream gages, or canal lining and encasement projects would not be expected to create a significant hazard to the public or environment from routine use of hazardous materials. Operation of boat ramps would include automobile and motorized boat and other watercraft usage, and routine use of hazardous materials would not be required for boat ramp operation. Maintenance and repair of boat ramps would be necessary periodically due to vehicle use, siltation, and gravel loss, for example. Heavy equipment may be required to facilitate some maintenance activities (e.g., gravel supplementation). Most heavy

[3] "Sewage sludge" refers to the solids separated during municipal wastewater treatment (USEPA 2022).

construction equipment requires petroleum products such as fuel, oil, and hydraulic fluid for effective operation. However, refueling and maintenance of this construction equipment onsite would likely not be required because maintenance activities such as gravel supplementation could be completed in a day. Hazardous materials such as paint and chlorine may be used during maintenance of some stream gages (e.g., for the stilling well/gage house). Large quantities of these types of materials would not be required for maintenance, and it is unlikely that these hazardous materials would be stored onsite because this type of maintenance would be periodic. Therefore, substantial spills would not occur, and these activities would not create a significant hazard to the public or the environment.

Operation of new or modified boat ramps would attract recreationists and could therefore expose them to wildland fires if the ramps are adjacent to wildlands, as noted for *Reservoirs and Points of Diversion*. Periodic maintenance and calibration of stream gages and other monitoring devices would be required and could occur during summer when vegetation is generally dry. Potential fire hazards related to maintenance include hot vehicle exhaust systems of maintenance vehicles, fuel-powered equipment, and grinding and welding activities, if required. This impact is potentially significant. Mitigation Measure 7.22 MM-HAZ-a–h: E includes BMPs to minimize wildfire risk related to maintenance vehicles and the use of welding equipment and fuel-powered equipment. Until mitigation measures are implemented, the impacts remain potentially significant.

Mitigation Measures

7.22 MM-HAZ-a–h: Mitigate hazards and hazardous materials impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction HAZ Mitigation Measures (CMM-HAZ-a–h)

1. **Measures for Transport, Use, or Disposal of Hazardous Materials:**

   i. Regulatory Compliance: Comply with all federal, state, and local plans, policies, ordinances, and permit requirements related to the handling, storage, transport, disposal, and accidental spill response for hazardous materials, including the Hazardous Waste Control Law, Cal/OSHA, and Asbestos National Emission Standards for Hazardous Air Pollutants for asbestos removal and disposal for demolition operations.

   ii. Hazardous Materials Storage: All hazardous materials will be stored in secondary containment in a clearly identified and protected area, and all hazardous materials brought onsite will have a Material Safety Data Sheet, that will be made readily available to employees and other personnel at the construction site.

   iii. Spill Prevention and Response Plan: Develop and implement a spill prevention and response plan that will comply with all governmental approvals and applicable local, state, and federal laws and regulations. The plan will include detailed procedures to prevent and respond to hazardous materials spills during construction of the project. At a minimum, the plan will include provisions for immediate response, containment, and cleanup of a spill, including excavation and disposal of contaminated soil at an approved disposal site, and notification

responsibilities. Materials needed for potential cleanup activities will be kept on site.

iv. Procedures for Hazardous Waste Generation and Disposal: Hazardous waste generated at work sites, such as contaminated soil, will be segregated from other construction spoils and properly handled, hauled, and disposed of at an approved disposal facility by a licensed hazardous waste hauler in accordance with state and local regulations. The contractor will obtain permits required for such disposal. The accumulation and temporary storage of hazardous waste will not exceed 90 days. Asbestos encountered as part of demolition activities will be disposed of according to the requirements of both the federal Clean Air Act and Cal/OSHA (Cal. Code Regs., tit. 8, subch. 4, art. 4, § 1529).

v. Procedures for Hazardous Materials Use near Streams: Storage, use, or transfer of hazardous materials in or near wet or dry streams will be consistent with Fish and Game Code section 5650 and/or with the permission of CDFW.

vi. Waste Management and Material Control Measures (CMM-WQ-a–j: 4)

2. **Project Siting**:

i. Avoid locating project construction areas within 0.25 mile of an existing or proposed school whenever feasible. If not feasible, provide preconstruction notification to schools within 0.25 mile of construction sites, alerting them of potential uses of hazardous materials and anticipated construction schedule.

ii. Avoid locating projects on potentially contaminated sites and hazardous materials sites (including sites on the most recent Hazardous Waste and Substances Sites [Cortese] List).

iii. Prior to beginning construction, project proponents will confirm utility/infrastructure locations through consultation with utility service providers, preconstruction field surveys, and services such as Underground Service Alert to ensure that underground utilities are not affected.

3. **Demolition Measures:**

i. Characterize and separate hazardous materials from structures before demolition and ensure that such materials are disposed of at an approved disposal site according to applicable regulations. Implement proper handling and disposal procedures for potentially hazardous materials, such as solvents and household or industrial-strength maintenance chemicals and cleaners in buildings to be demolished.

ii. As applicable, a Cal-OSHA-certified lead-based paint contractor will prepare a site-specific lead hazard control plan with recommendations for the containment of lead-based paint materials during demolition activities, for appropriate disposal methods and locations. Containers suspected of, or confirmed as, containing lead-based paint will be separated from other building materials during the demolition process. Separated paint will be classified as a hazardous waste if the lead content exceeds 1,000 parts per million and will be disposed of in accordance with applicable regulations.

iii. Hazardous waste, including contaminated soil, generated at demolition sites will be handled, hauled, and disposed of at an appropriately licensed disposal facility under appropriate manifest by a licensed hazardous waste hauler.

4. **Herbicide and Pesticide Use:** Any chemical considered for control of invasive species must adhere to all regulations, be approved for use in California, adhere to all DPR regulations, and be applied by a licensed applicator under all necessary state and local permits. A pest control advisor can ensure that legal, appropriate, and effective chemicals are used with appropriate methodologies. Aquatic pesticides will be applied in compliance with NPDES order(s), where applicable.

5. **Hazardous Materials and Worksite Safety Training:** Provide hazardous materials and work site safety training for construction workers in accordance with local, state, and federal requirements, including but not limited to the Occupational Safety and Health Act, title 9 of C.F.R. and California Code of Regulations title 8.

6. **Emergency Response Plan:** The project proponent will develop and implement an emergency response plan. The emergency response plan will include descriptions of procedures to be implemented to help prevent emergency incidents, to ensure preparedness if these incidents occur and to provide a systematic and orderly response to emergencies through coordination with emergency response agencies. The emergency response plan will be posted and readily accessible on site and will be coordinated, as applicable, with a traffic management plan (CMM-TRA-a,b,d–f: 2), fire prevention and management plan (CMM-HAZ-a–h: 9), and spill prevention and response plan (CMM-HAZ-a–h: 1iii).

7. **Construction Site Security:** To ensure adequate construction site security where equipment, chemicals, or hazardous conditions may be present, implement the following.

   i. Fence project construction site and install and enable motion-detecting lights.

   ii. Provide 24-hour on-site security personnel. Security personnel will serve as the first line of defense against criminal activities and nuisances at construction sites. Private patrol security operators hired to provide site security will have the appropriate licenses from the California Bureau of Security and Investigative Services. Individual security personnel will have, at a minimum, a security guard registration license that meets the California Bureau of Security and Investigative Services requirements for training and continuation training as required for that license. All security personnel will also receive environmental training similar to that of on-site construction workers so that they understand the environmental conditions and issues (e.g., hazardous conditions, cultural resources present) associated with the various areas for which they are responsible at a given time. At a minimum, the project construction site will be fenced**.**

8. **Construction near Airports:** Where construction occurs within an airport land use plan area, within 2 miles of a public airport or public use airport, or within the vicinity of a private airstrip, the following BMPs will be implemented, at a minimum, to avoid safety hazards for people residing or working in the project area.

   i. Follow applicable requirements of any relevant airport land use compatibility plan relevant to the proposed project site or area.

ii. If proposed construction is within 2 miles of a private airstrip, coordinate with that airport to ensure that construction activities do not introduce air safety hazards.

9. **Fire Prevention and Management Plan:** A fire prevention and management plan will be developed to address fire prevention and response methods, including fire prevention and management/suppression measures. Coordinate with local, state, and federal fire suppression agencies, as applicable, in development of the plan. The fire prevention and management plan will, at a minimum, require the following BMPs be implemented.

    i. Identify and adhere to local laws, ordinances, and building codes related to fire prevention and protection, burning, welding, and other potentially hazardous activities that could increase the potential for fires in general and for wildland fires; obtain any necessary permits; and adhere to permit conditions.

    ii. Clear or wet areas of construction and demolition (as applicable) containing dried vegetation to prevent wildfires in high-risk areas.

    iii. Prohibit smoking, open flames, or welding in on-site refueling or service areas.

    iv. Maintain an adequate number of fire extinguishers and other tools and equipment that can be used for fighting fire on site and ensure that personnel are trained in their use.

    v. If refueling is done on site, turn off vehicle engines during refueling.

    vi. Equip all construction vehicles and machinery with functional spark arresters and/or mufflers, where applicable.

    vii. Maintain a water tender during extensive welding and cutting operations.

    viii. If the project includes blasting activities, include special precautions to minimize the risk of fire related to any explosive materials on the project site.

10. **Asbestos Control Measures** (CMM-AQ-a–e: 5)

11. **Valley Fever Control Measures** (CMM-AQ-a–e: 4)

12. **Blasting Operations and Safety Plan** (CMM-GEO-a–e: 7)

13. **Septic System Management Measures** (CMM-GEO-a–e: 6)

14. **Mosquito Control Measures:** Eliminate standing water to reduce mosquitoes at a construction site. Avoid leaving containers that can accumulate water in an uncovered or upright position. This includes wheelbarrows, drums, buckets, cans, tarps, and other containers. Create holes to drain water from containers. Fill in potholes and other areas where water is likely to accumulate. Routinely remove garbage and other debris. Implement CMM-HAZ-a–h: 4 if pesticide is applied.

15. **Installation and Operation of Underground and Aboveground Storage Tanks:** Conduct design, siting, construction, and operations activities in compliance with all applicable federal, state, and local laws and regulations, including but not limited to, International Fire Code, National Fire Protection Association (NFPA) codes (NFPA 30, 30A, 303), Uniform Fire Code (Articles 52 and 79), California Fire Code (Cal. Code Regs., tit. 19, div. 1), NPDES (40 C.F.R. pt. 122), U.S. Coast Guard requirements for transferring

oil or hazardous materials (33 C.F.R. pt. 154), and USEPA spill prevention control and countermeasure plan requirements (40 C.F.R. pt. 112).

16. **Installation and Maintenance of Plumbing in Public Restrooms:**

    i. Design, site, and construct restroom facilities in compliance with all applicable state and local laws and regulations, including but not limited to, California Plumbing Code (Cal. Code Regs., tit. 24, pt. 5) and applicable municipal code related to sanitary sewer connections.

    ii. Public restrooms and associated infrastructure will be regularly maintained to ensure that toilets and sewage lines are functioning properly at all times.

B. Hazardous Materials Storage: Hazardous material storage areas, including temporary storage areas, will be equipped with secondary containment sufficient in size to contain the volume of the largest container or tank. Incompatible materials will not be stored together.

C. Hazardous Materials Accidental Spill Response Plan: Develop and implement a hazardous materials accidental spill response plan that will outline methods, materials, and responsibilities for the response to, and clean-up of, an accidental hazardous material spill on site. At a minimum, the plans will include provisions for immediate response, containment, and cleanup of a spill, including excavation and disposal of contaminated soil and notification responsibilities. Materials needed for potential cleanup activities will be kept on site. In the event of a spill, hazardous waste will be disposed of in accordance with applicable federal, state, and local laws and regulations at approved facilities.

D. Hazardous Materials Training: Provide annual hazardous materials training for employees in accordance with local, state, and federal requirements, including but not limited to, the state and federal Occupational Safety and Health Act. Personnel training will include management, awareness, and handling of hazardous materials and hazardous wastes; recognition of existing or potential hazards resulting from accidental spills or other releases; and implementation of evacuation, notification, and other emergency response procedures.

E. Wildfire Prevention Plan: For projects located in areas designated as Very High or High Fire Hazard Severity Zones, prepare and implement a site-specific wildfire prevention plan that, at a minimum, includes the following measures.

1. **Signage:** Install and maintain fire restriction and fire danger signage in locations visible to the public.
2. **Parking Restriction:** Restrict parking to cleared areas away from dry vegetation.
3. **Vegetation Maintenance:** Perform regular vegetation clearance in critical locations to reduce wildfire intensity and rate of spread.
4. **Fire Fighting Equipment:** Provide site operations and maintenance staff with access to a fire extinguisher and other tools and equipment that can be used for fighting fire onsite and will be trained in the use proper use of firefighting equipment.

F. Reservoirs and Points of Diversion HAZ Mitigation Measures

1. **Reservoirs and Points of Diversion WQ Mitigation Measures** (7.22 MM-WQ-a–j: B)
2. **Handling, Storage, and Disposal of Dredged Material** (CMM-WQ-a–j: 4vi)

3. **Hazardous Material Storage** (7.22 MM-HAZ-a–h: B)
4. **Hazardous Materials Accidental Spill Response Plan** (7.22 MM-HAZ-a–h: C)
5. **Hazardous Materials Training** (7.22 MM-HAZ-a–h: D)
6. **Wildfire Prevention Plan** (7.22 MM-HAZ-a–h: E)
7. **Air Safety Mitigation:** For new reservoir projects located within 2 miles of a public airport, implement the following.
    i. Follow applicable requirements of any applicable Airport Land Use Compatibility Plan.
    ii. Implement measures to reduce wildlife attractants near airports and private airstrips, including the following.
        - Avoid creating hazardous wildlife attractants within a distance of 10,000 feet of an Airport Operations Area.
        - Maintain a distance of 5 statute miles between the farthest edge of the Airport Operations Area and hazardous wildlife attractants.
8. **Mosquito Control:** Coordinate with the applicable mosquito and vector control or abatement district regarding ongoing control of larvae and adult mosquitoes. BMPs to be implemented may include the following.
    i. Implement monitoring and sampling program to detect early signs of localized increase in mosquito population at project facilities.
    ii. Use biological agents such as mosquito fish (*Gambusia affinis*) to limit larval mosquito populations.
    iii. Use larvicides and adulticides, as necessary. If larvicides and adulticides are required, prepare a monitoring program for review by fish and wildlife agencies to evaluate potential effects related to application of these pesticides on macroinvertebrates and covered fish species. Pesticide use for mosquito abatement will be conducted by a trained and certified vector control pesticide applicator. Only pesticides approved by both USEPA and DPR will be used.
    iv. If pesticide use is required, minimize public exposure to pesticide-treated areas by posting notices adjacent to treatment areas and at public access points for the day of treatment.
9. **Blasting Operations and Safety Plan** (CMM-GEO-a–e: 7)

G. Groundwater Storage and Recovery HAZ Mitigation Measure

1. **Mosquito Control** (7.22 MM-HAZ-a–h: F8)

H. Water Treatment Facilities HAZ Mitigation Measures

1. **Hazardous Materials Business Plan:** Prepare a Hazardous Materials Business Plan that will provide for safe storage, containment, and disposal of chemicals and hazardous materials used in reportable quantities (Health & Saf. Code Div. 20, Ch. 6.95 §§ 25500–25547.8, Article 1). The plan will include a description of the facility, including a site map; an inventory of applicable hazardous materials used and stored onsite, including hazardous materials safety data sheets; and an emergency response and employee training plan. The plan will be submitted to the local Certified Unified Program Agency for approval prior to project construction, and annually thereafter.
2. **Design of On-Site Access and Service Roads:** On-site access and service roads would be designed to minimize transportation hazards and would incorporate the following design features.
    i. On-site access roads would be designed with a minimum width of 24 feet, and service roads would be designed with a minimum width of 16 feet.
    ii. The facility site plan would be designed such that all transport vehicles would have looped access and would not be required to back up at any point during delivery of chemicals. A minimum 60-foot turning radius would be allowed for truck deliveries.
    iii. Onside roadways would provide service access to all sides of the water treatment facility, and chemical delivery would be located away from the center of general operations and visitors.
    iv. Truck traffic would be separated from employee and visitor traffic to the maximum extent possible.
3. **Measures for Transport, Use, or Disposal of Hazardous Materials** (CMM-HAZ-a–h: 1) for operation and maintenance
4. **Herbicide and Pesticide Use** (CMM-HAZ-a–h: 4) for maintenance
5. **Hazardous Materials Storage** (7.22 MM-HAZ-a–h: B)
6. **Hazardous Materials Accidental Spill Response Plan** (7.22 MM-HAZ-a–h: C)
7. **Hazardous Materials Training** (7.22 MM-HAZ-a–h: D)
8. **Wildfire Prevention Plan** (7.22 MM-HAZ-a–h: E)
9. **Water Treatment Facilities WQ Mitigation Measure** (7.22 MM-WQ-a–j: D)
10. **Groundwater Storage and Recovery HAZ Mitigation Measure** (7.22 MM-HAZ-a–h: G)

I. Other Construction Projects HAZ Mitigation Measure

1. **Wildfire Prevention Plan** (7.22 MM-HAZ-a–h: E)

7.22.2.9 Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IX. Hydrology and Water Quality				
Would the project:				
a. Violate any water quality standards or waste discharge requirements	☒	☐	☐	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)	☒	☐	☐	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site	☒	☐	☐	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site	☒	☐	☐	☐
e. Create or combine runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff	☒	☐	☐	☐
f. Otherwise substantially degrade water quality	☒	☐	☐	☐
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map	☒	☐	☐	☐
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows	☒	☐	☐	☐
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
j.	Inundation by seiche, tsunami, or mudflow	☒	☐	☐	☐

Sections 7.12.1.2, *Environmental Setting* and 7.12.2.2, *Environmental Setting*, describe the surface water and groundwater setting, respectively. Additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Construction activities have the potential to violate water quality standards or waste discharge requirements (WDRs) or otherwise substantially degrade water quality. Construction activities may lower local groundwater through dewatering and substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river in a manner that could result in substantial erosion, siltation, or flooding on or off site. Depending on the location and type of project, structures could be placed within a 100-year flood hazard area; implementation of the project could expose people or structures to a significant risk of loss, injury, or death involving flooding; and the project could be subject to inundation by seiche, tsunami, or mudflow.

All construction activities have the potential to contribute polluted runoff and sediment to nearby waterbodies, potentially violating water quality standards or otherwise degrading water quality. Construction sites can generate stormwater runoff that can negatively affect the quality of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment; however, pH and other non-visible pollutants are also of concern. Excess sediment can reduce the amount of sunlight reaching aquatic plants, clog fish gills and thereby interfere with respiration, smother aquatic habitat and spawning areas, and impede navigation in waterways. Sediment also transports other pollutants such as nutrients, metals, oils, and greases.

In-water construction can cause temporary sediment disturbance and resuspension, which may cause increased turbidity, siltation, and bioavailability of sediment-associated pollutants. Dredging and excavation are two types of in-channel activities that are likely to cause increased turbidity. Dredging typically refers to removal of sediment to increase channel depth, often for navigation, but also potentially for creating geomorphic changes. Excavation typically refers to removal of sediment in shallower water (^USACE 2020), often for structure placement or maintenance. Other types of in-channel activities that could increase movement of sediment include breeching levees, pile driving, and placement or removal of structures. Construction-related release of ponded surface water (e.g., by use of sheet-pile barriers or check dams) could also affect surface water quality. Ponded water could have elevated temperature, turbidity, or construction contaminants and could affect water quality when it is discharged to a surface waterbody.

Another type of in-water construction activity that could affect water quality is the placement of fill. This may include placement of temporary gravel berms, cofferdams, or other structures to provide construction access and isolate work areas from water; and permanent placement of structures or material, such as soil (for recontouring), rocks, wood, or gravel. Placement of fill can cause turbidity to increase and, depending on the type of fill, can introduce contaminants. Fill can also affect channel hydraulics, potentially causing erosion and sedimentation. If the quantity of fill is large, or if it is

placed in an instream location that may already be somewhat constricted, it could increase the likelihood of flooding.

Construction could also result in accidental release of pollutants, which could adversely affect water quality. Construction pollutants can enter storm drains or streams directly or indirectly. Pollutants from construction activities include petroleum products (e.g., fuel, oil and grease from vehicles and equipment), paving materials such as concrete and asphalt (e.g., accidental discharge of concrete wash water or wet concrete into a waterway can increase pH), other materials used or stored on site (e.g., paint, adhesives, solvents), and project waste (e.g., litter, debris, hazardous and liquid waste). The use of herbicides to control invasive plant species during and after construction could affect water quality and violate water quality standards if improperly applied or stored.

Untreated groundwater used to control dust at construction sites could deposit dissolved salts on the ground's surface, which could ultimately enter nearby surface water. In addition, if improperly stored, contaminated dredged material or other materials could be stockpiled in storage or disposal areas within a construction site and reintroduced to waterways through erosion. Weathering of spoils could cause leaching and oxidation, thereby releasing chemicals into the water.

Construction activities that involve blasting, as well as saw-cutting, and hydraulic hammering, for example, could release concrete dust and other particles into surface waters, which could violate water quality standards and/or affect aquatic resources. Fugitive dust from blasting may cause a temporary increase in turbidity in nearby surface waters depending on proximity to blast and dust generated. In crystalline bedrock, blasting may also cause turbidity in, as well as the introduction of metals and other contaminants to, groundwater by loosening sand and rock particles, silt, and chemical precipitates that line subsurface fractures (^NHDES 2010). In addition, blasting materials such as explosives and detonators may not be fully combusted during blasting, which may result in the release of soluble substances to groundwater (^NHDES 2010).

Some new or modified facilities may include installation of USTs or ASTs for bulk fuel storage and/or construction and maintenance of public restrooms (e.g., recreation facilities at new reservoirs). Faulty installation or inadequate operation and maintenance procedures may result in the release of fuel from UST and ASTs, which could result in surface water and groundwater contamination. Improper siting, construction, or maintenance of restrooms could result in the release of raw sewage, which could adversely affect groundwater and surface water quality. Septic systems are not typically installed for use during construction. However, for projects that include installation of septic systems, improper siting of these systems could result in adverse water quality effects. If a septic system is not working properly, depending on its location, it can contaminate nearby surface water or groundwater with excess nutrients and pathogens.

Localized degradation of groundwater quality could result from temporary, short-term construction activities such as building temporary access roads and other temporary facilities. If hazardous materials were to be discharged to the land surface or surface waters during this work, they could seep into underlying aquifers. If the discharge volume was large enough and/or the water table was high, the hazardous materials could degrade local groundwater quality to a sufficient degree to impair its continued use.

Water quality could be affected by dewatering. In some cases, groundwater may accumulate in excavated areas. If the groundwater is of poor quality and is discharged to a surface waterway, surface water quality could become degraded by increased turbidity, dissolved solids, nutrients,

metals, or other constituents. The volume of groundwater dewatering associated with construction of new or modified facilities would likely have minimal effect on groundwater supplies.

Construction could substantially alter drainage patterns of a project site and thereby cause erosion or siltation, or flooding, onsite or offsite. Erosion and runoff could occur at any construction site because stormwater runoff occurs on all land surfaces. Actual alterations of drainage patterns would depend on the type of construction activity and site-specific hydrologic and hydraulic factors. Land grading; placement of dredged or excavated material; constructing structures, roads, and earthen embankments; and stockpiling construction materials could create physical barriers to flowing stormwater runoff (drainage), which could redirect runoff and potentially contribute to flooding onsite and offsite. In addition, construction activities could change the on-site land slopes across which drainage flows, which could alter the flow rates, directions, water surface elevations, or velocities of runoff that enters or originates on the construction site.

Activities such as grading, vegetation removal, soil compacting, or paving could increase land surface imperviousness (inability to be penetrated by water) and decrease precipitation losses to soil infiltration. Impervious surfaces can affect water quality by creating surfaces where pollutants, such as petroleum products from vehicles, can accumulate and later be washed into waterways, causing polluted runoff. Impervious surfaces can affect hydrology by preventing rainwater from absorbing into the soil and thus increasing runoff and reducing groundwater recharge. Increased runoff can cause increases in local flooding, erosion, and exceedances of the capacity of stormwater drainage systems. Construction of some new or modified facilities could add relatively large areas of impervious or semi-impervious surfaces. For example, paved or concrete areas such as roads and parking lots, and large buildings and other structures would likely be necessary for new water treatment facilities, desalination facilities, new points of diversion, and new reservoirs. If facilities are located in areas with characteristics such as steeply sloped areas or moderately to highly erodible soils, increased impervious surfaces may be more likely to cause erosion.

If infrastructure is placed in a location where substantial movement of flood flows could occur, such as new diversion infrastructure located in a channel or a new water treatment facility located adjacent to an un-leveed channel, the structure could impede or redirect flood flows. Placement of structures in 100-year flood hazard areas could result in exposure to property loss, but exposure to injury or death is unlikely.

The susceptibility of a project to a seiche, tsunami, or mudflow depends on location. A seiche is a large standing wave that forms in a semi- or fully enclosed body of water (e.g., lake or reservoir) and can be caused by seismic activity or strong winds and a rapid change in atmospheric pressure (USGS n.d.; NOAA n.d.). Tsunamis are large waves that form in oceans and seas, typically because of an earthquake, landslide, or volcanic eruption. If new or modified facilities were sited near reservoirs and within 1 mile of the coastline, these projects could be subject to inundation by seiches and tsunamis, respectively. Mudflows typically occur in steep terrain and may or may not be the result of an earthquake. Siting a project in an area subject to mudflows could result in inundation of the project by a mudflow. However, the new or modified facilities in and of themselves would not change the conditions that create these natural hazards.

Impacts on hydrology and water quality associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-WQ-a–j: A (CMM-WQ-a–j). The magnitude of construction impacts depends on the extent, location, and duration of construction. Common mitigation or BMPs to avoid, minimize, or offset

potential hydrologic and water quality effects may include preconstruction surveys and analysis, preparation and implementation of site-specific SWPPPs, turbidity compliance monitoring, preproject drainage and flood conveyance studies, and erosion control measures. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-WQ-a–j: B–D can avoid or reduce project-specific potentially significant impacts on water resources from new or modified facilities. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, impacts on water quality cannot be determined with certainty at this time. Therefore, potential hydrologic and water quality impacts remain potentially significant.

Sections 7.12.1, *Surface Water,* and 7.12.2, *Groundwater*, evaluate the environmental effects of increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, as well as applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Reservoir and point of diversion projects can range from small projects (e.g., simple relocation of an existing diversion structure) to large projects (e.g., constructing a new dam and reservoir). The impacts on hydrology and water quality associated with these projects are related to the size of the project, as well as the magnitude and duration of instream construction required. Depending on the type and size of the project, construction activities could take place over several years and would include major excavation activities—particularly for the dam and inundation footprint for new reservoirs, as well tunneling, trenching, surface and groundwater dewatering, quarrying, potentially demolition, and other activities. Many of the associated construction impacts for small reservoir and diversion projects can be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

For larger dam and diversion projects, extensive analysis and evaluation is required before any construction because of likely long-term significant impacts on hydrology and water quality. Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, details flow and ecosystem processes, including the effects of dams and altered flow regimes that negatively affect water quality. Dams and altered flow regimes can reduce or eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter temperatures to the detriment of coldwater species, and alter salinity gradients and circulation patterns in the Delta. Importantly, the purpose of the proposed Plan amendments is to restore a more natural hydrologic flow regime to protect the ecosystem that supports fish and wildlife beneficial uses. This is needed largely to mitigate existing and ongoing impacts from existing dams and diversions. Any new or modified water supply project would undergo extensive hydrologic modeling of operations and analysis of impacts on the aquatic ecosystem and fish species, water quality, surface water, and water supply to ensure that that any new dam or diversion structure does not exacerbate existing problems and/or create additional water quality problems in the Bay/Delta watershed.

Hydromodification, including flow regulation, dredging, and construction of dams, provides important infrastructure for human activity such as flood control and water supply; however, hydromodification is also a major source of water quality impairment (^USEPA 2007). New or modified reservoirs and points of diversion reduce stream flows, which could injure water right holders, alter water quality, affect surface water-groundwater interactions, and affect groundwater

recharge. Changes in flows could alter water temperature, dissolved oxygen, conditions associated with HABs and growth of invasive aquatic vegetation, and Delta salinity, as well as dilute contaminants. Potential benefits of changes in streamflow include reductions in peak winter flow, which would reduce large-scale movement of substrate and potentially contaminated sediment. Changes also could reduce floodplain inundation, potentially reducing formation of methylmercury. Some dams can prevent further expansion of invasive species.

Lower flows could reduce the longitudinal extent of cool temperatures downstream of reservoirs and result in less dilution of contaminants that might enter the waterway downstream. The sources of contaminants vary by watershed but may include agricultural and urban runoff, municipal wastewater, and runoff from natural areas. Changes in streamflow could affect instream chemical constituent concentrations due to changes in instream dilution, potentially affecting the ability of a waste discharger or drinking water provider to comply with WDRs and/or water quality standards.

Reservoirs influence the temperature and chemical composition of water in the reservoir and receiving water downstream of the new dam. During periods of low reservoir storage, coldwater supply at the bottom of the reservoir may become depleted, and the temperature of water released from the reservoir may increase. HABs, growth of invasive aquatic vegetation, and methylation of mercury may continue to occur even well after the period of initial filling. HABs may be most likely during conditions of low storage when nutrients may be more concentrated. HABs could affect recreational use of the reservoir and drinking water quality if the reservoir was a source for drinking water and cyanobacteria and cyanotoxins were released downstream in sufficient concentrations. Increased concentrations of methylmercury in algae and fish have been associated with high fluctuations in reservoir water surface elevation (SWRCB 2017) and with lower levels of primary productivity.

Reservoirs increase mercury methylation and bioaccumulation (SWRCB 2017). Mercury is converted to the more toxic and bioavailable methylmercury when anaerobic conditions are present (^Central Valley Water Board 2010). The relatively abundant organic carbon from newly inundated soils and vegetation in a new reservoir can stimulate bacterial methylation of mercury that may be present in soils from atmospheric deposition or of naturally mercury enriched areas, for example, or in water diverted to reservoir storage. Mercury methylation in new reservoirs can result in aqueous methylmercury concentrations up to approximately three times the long-term average for several years following initial filling of the reservoir (SWRCB 2017). The aqueous methylmercury concentration in a reservoir is a major determinant of the reservoir's fish tissue methylmercury concentration; elevated fish tissue methylmercury in new reservoirs persists for 10 to 20 years for non-piscivorous fish, and up to 35 years for piscivorous fish (SWRCB 2017).

Some water quality concerns such as HABs and formation of methylmercury may be greatest during initial filling of a new reservoir or initial filling of new areas within an existing reservoir that has been modified to increase storage (e.g., by increasing dam height). During the initial filling, nutrient concentrations are likely to be fairly high due to inundation of soils and vegetation within the reservoir footprint. High nutrients combined with potentially warm reservoir water temperatures in late spring through summer could create conditions conducive to HABs. Cyanobacterial blooms can release toxins (cyanotoxins) that are hazardous to humans and are therefore a concern for recreational and municipal and domestic water supply (specifically drinking water) beneficial uses. High nutrient levels and elevated water temperature would also be expected to support the growth of aquatic vegetation, including invasive aquatic vegetation. In addition, elevated nutrient levels in

releases from a reservoir that has been newly inundated could contribute to excessive plant and algal growth downstream.

Aquatic invasive species (AIS) can be introduced inadvertently to reservoirs through recreational boat use. For example, Brazilian waterweed (*Egeria densa*) fragments can attach to boat propellers or trailers and zebra mussels (*Dreissena polymorpha*) can attach to boat hulls and be transported between waterbodies. AIS could become established in new reservoirs and be released downstream. AIS can affect surface water beneficial uses in multiple ways, including reducing oxygen levels, altering turbidity, and displacing native aquatic species.

In addition to sediment impacts from construction, reservoirs can affect channel erosion, sedimentation, and morphology because of long-term changes in the sediment balance. Sediment may accumulate at the bottom of a new reservoir or in an expanded reservoir due to the reduced velocity of water entering a reservoir as well as shoreline erosion. Expansion of a reservoir would result in a larger shoreline area, which would be subject to erosion by seasonal fluctuation in water levels as well as wave action. Sediment accumulation at the bottom of a reservoir may contribute to anoxic conditions and reduced water quality at the bottom of a reservoir. The capture of sediment behind a dam reduces a sediment supply to downstream waterways, affecting habitat and altering the balance between erosion and sedimentation.

Expansion of a reservoir through dredging would entail removing sediment from an existing reservoir and depositing the sediment elsewhere for disposal or use. Dredging could result in water quality impacts both within the reservoir and downstream in receiving waters. Dredging would mobilize sediment and temporarily cause excessive turbidity within the reservoir from sediment resuspension in addition to downstream, if reservoir releases occurred during, or closely following, dredging operations. These increases may temporarily exceed water quality objectives for suspended sediment and turbidity.

Dredged sediments may contain contaminants (e.g., mercury and other metals, polychlorinated biphenyls, polyaromatic hydrocarbons) in concentrations that may violate water quality standards or otherwise degrade reservoir and downstream water quality if mobilized. Dredging may result in the indirect, temporary, and short-term reduction of dissolved oxygen in the water column as a result of the suspension of anoxic organic matter in sediment. Suspension of this organic matter results in a temporary increase in chemical and biological oxygen demand in the water column (USACE 2015). Dredged material has the potential to affect surface water and groundwater due to spillage, erosion, or other discharge (e.g., leachate from dredged material) resulting from on-land management methods. These methods can include short-term placement of dredged material during off-loading or re-handling, discharge of effluent from confined disposal facilities[4] as part of the dewatering process, or long-term storage of dredged material prior to final disposal. Discharge of effluent from a confined disposal facility could alter the existing drainage pattern of the site and result in erosion, and consequent sedimentation and turbidity in nearby surface waters. If dredged sediment is contaminated, effluent discharge could contaminate nearby surface water or groundwater. Dewatered dredged material could be temporarily stockpiled onsite and reintroduced to waterways through stormwater runoff if improperly stored and contained. Rainfall events may also leach contaminants from dewatered, stockpiled dredged material and introduce them to nearby surface water or groundwater via runoff. For example, accumulation of salts can develop on the

[4] A "confined disposal facility" is a diked disposal structure constructed in upland or nearshore areas, or at island containment areas (USACE 2015).

surface of dredged material, and certain metal contaminants may also become dissolved by rewetting stockpiled dredged material (USACE 2015).

If recreation was accommodated at a new reservoir, groundwater could be used as a potable source or for use in restrooms; this use could seasonally (i.e., during the summer recreational season) lower groundwater levels. However, if this were to occur, it would be temporary and would not be expected to substantially deplete groundwater in the area. Reservoir expansion would not require long-term extraction of groundwater as part of operations or maintenance. For new or modified reservoirs, groundwater may be recharged from surface water in the inundated area of the reservoir. Depending on potential changes in the surface water hydrology downstream of new or modified reservoirs and baseline surface water-groundwater interactions, groundwater recharge may be affected at certain times of year and in some water-year types. The largest potential effect on downstream groundwater recharge would likely occur in floodplain areas, such as bypasses, that were inundated during the rainy season by water that has now been captured behind a new or modified dam.

New or modified reservoir projects would alter the existing drainage pattern of the project area in a manner such that erosion and siltation may occur onsite due to capture of sediment behind the reservoir dam and erosion along the shoreline. However, reservoirs tend to reduce downstream erosion by reducing peak winter flows. The capacity of existing stormwater drainage systems would not be affected by operation of new or modified reservoirs unless the drainage system is in the reservoir footprint. It is likely that new reservoir projects would be located in rural areas with no formal existing stormwater management system.

Dams generally reduce downstream flooding. However, flooding (including flooding as a result of the failure of a levee or dam) related to reservoir operations could occur in several ways. Once constructed, the reservoir area would provide storage to minimize major floods downstream of the dam. Off-stream reservoirs would reduce flooding associated with local drainages in the reservoir footprint and could reduce flooding in the source-water stream by diverting water during high flows. During construction of a dam raise, if the water level were to increase to unsafe levels while the outlets and spillway were nonoperational, overtopping and flooding could occur. If improperly designed or constructed, a new or modified dam could fail, causing flooding. In the unlikely event of dam failure via surface fault rupture or other means of structural compromise, widespread flooding could occur downstream of the dam. However, as described in Section 7.22.2.7, *Geology and Soils*, new or modified dams would be designed to conservative standards with a low potential for failure.

Flood control rules would be developed for new or modified reservoirs to provide sufficient storage space to contain inflow during high runoff events and prevent use of emergency spillways. Reservoir releases are generally limited to flows that can be contained by downstream levees, although in some instances of very high inflows, required reservoir releases may exceed downstream levee capacities. Any such exceedances would likely be less than what would occur in the absence of the new or modified reservoir.

If facility pipelines associated with reservoirs and points of diversion were constructed through or under levees, that construction could compromise the integrity of the levee and cause flooding that, depending on the location, could expose people or structures to a risk of loss, injury, or death.

Impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-WQ-a–j: B–D would minimize hydrology and water quality impacts associated with new or modified reservoirs and points of diversion. A water right

application to appropriate water by permit with the State Water Board is required. Consideration of such an application is a discretionary action that requires a determination that unappropriated water is available, a review of potential impacts on public trust resources, and a determination that the appropriation of water is in the public interest. Large new and modified reservoir and diversion projects require extensive analysis and evaluation to ensure proper siting, design, construction, and functioning and to avoid impacts on surface water and groundwater, as well as impacts related to flooding (see Mitigation Measures 7.22 MM-WQ-a–j: 8 and 7.22 MM-GEO-a–e: B2 and B3). Operation must include releases or bypassing a portion of flows to preserve downstream ecological functions and/or to meet Delta water quality and flow objectives. The State Water Board and regional water boards have authority under existing law to include permit requirements for nonpoint-source discharges and applicants for dredging activities to control contaminants (Mitigation Measure 7.22 MM-WQ-a–j: B). Reservoir dredging would conform to dredging permits and a dredging plan (Mitigation Measure 7.22 MM-WQ-a–j: B11). Additional mitigation measures include methylmercury management for new reservoirs, HABs management for new reservoirs, management of aquatic invasive species and planning and construction timing for a dam raise project to avoid flooding (Mitigation Measures 7.22 MM-WQ-a–j: B8–10). Because the precise location and magnitude of activities required for implementation of new or modified reservoirs and points of diversion are not known, impacts on water quality cannot be determined with certainty at this time. Therefore, potential hydrologic and water quality impacts remain potentially significant.

New or modified reservoirs and points of diversion can help facilitate water transfers. The environmental effects of increased use of water transfers using existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (under *Other Water Management Actions*).

Groundwater Wells and Groundwater Storage and Recovery

New groundwater wells and groundwater storage and recovery projects could result in hydrology and water quality impacts related to construction. Most hydrology and water quality impacts related to construction of these projects could be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

It is important that wells and groundwater storage and recovery projects be located in areas suitable for the project purpose and in a manner that does not exacerbate any existing groundwater quality problems. If new groundwater wells are not appropriately sited or properly designed/constructed, contaminants could be introduced into the groundwater. For example, if a groundwater well was located close to a feedlot, a septic leach field, or solid waste disposal site, the groundwater from that well may be contaminated due to those adjacent land uses. Further, if the space between the well casing and the wall of the drilled hole is not sealed, that space (the annular space) can become a pathway for the movement of pollutants and poor-quality water (DWR 1991). Construction of a well at a site with expansive soils at the surface could damage the well seal or uppermost pipe. A damaged well seal or pipe could allow surface runoff to enter the well, potentially contaminating it. In addition, groundwater quality could be adversely affected by well drilling. Specifically, the drilled wellbore could provide a subsurface pathway for groundwater contamination and drilling fluids may released during the drilling process, which could cause groundwater contamination.

If multiple aquifer zones of varying water quality are cross-connected, new wells in these areas could cause a general degradation of groundwater quality. For example, in areas underlain by

Corcoran clay that forms a barrier between the upper and lower aquifer systems, head differences between the upper and lower aquifer systems could drive vertical flow through boreholes and wells that penetrate the clay layer (Stanislaus County Department of Environmental Resources 2018). Depending on the initial water quality of existing wells and the location of new groundwater wells, this could be a rare occurrence that could be lessened by prohibiting construction of composite wells that occur in both shallow and deep aquifer systems.

Occasional well maintenance would be conducted on new wells but would not involve ground-disturbing activities. Maintenance may include pump inspection and water sampling, which may involve pumping and backwashing water. As discussed in Section 7.22.2.8, *Hazards and Hazardous Materials*, groundwater well operation and maintenance may require the use of hazardous materials (e.g., chlorine gas or sodium hypochlorite for water disinfection); therefore, there would be the potential for accidental release of these materials into the environment. Effluent from backwashing could temporarily reduce the water quality of receiving waterbodies, but effects would likely be minimal.

Impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measures 7.22 MM-WQ-a–j: C would minimize potential impacts on water quality from siting and construction of new groundwater wells. Until mitigation measures are implemented, the impacts remain potentially significant.

Operational effects on hydrology and water quality due to increased groundwater pumping and groundwater storage and recovery, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.12.1, *Surface Water,* and 7.12.2, *Groundwater*.

Water Treatment Facilities

New or modified water treatment facilities could affect water quality by contaminating surface water and/or degrading groundwater. The potential for this to occur would be due, in large part, to construction activities, which may result in erosion, stormwater runoff, the accidental introduction of chemicals to surface water or groundwater through accidental spills, and other potential effects. In addition, it is possible that new or modified water treatment facilities would be in a 100-year flood hazard area because these facilities are often located adjacent to rivers and streams so they can divert or discharge water. Modifications to existing facilities are unlikely to cause flooding-related effects, but new water treatment facilities could impede or redirect flood flows or experience flood-related damage because of their location. These impacts can be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

Water treatment facilities remove contaminants from water using a variety of chemical, physical, and biological methods. All treatment processes generate waste that is highly regulated under various permits depending on whether waste is discharged to water or land. Water treatment facilities could violate standards or WDRs if discharges do not comply with all regulations pertaining to water quality standards and regulations to prevent degradation of water quality in receiving waters. For example, the water treatment process generates sludge, which is a mixture of solids; the composition of sludge is site specific and can include a mixture of solids such as source water organic matter, microorganisms, metals, radionuclides, and other organic and inorganic constituents (USEPA 2011). Sludge can be dried onsite in drying beds and then transported off site to a permitted landfill. Sediment or chemicals could be released from the sludge into surface water or groundwater if the sludge was not controlled carefully from the point of generation through disposal.

New drinking water treatment plants that include groundwater wells could result in the impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*).

Seawater and brackish water desalination facilities use many of the same chemicals and generate similar waste streams to conventional treatment plants with a water intake and waste discharges. Salt, minerals, and other compounds produced as a byproduct of desalination are discharged as hypersaline brine that, in high enough concentrations, could degrade water quality and adversely affect the beneficial uses of the receiving waters. Waste discharges from desalination facilities have the potential to form dense, non-buoyant plumes that settle, spread along the seafloor, and have negative impacts on marine life. (SWRCB 2015b.)

In addition, desalination facilities may use subsurface or open water intakes for source water diversions. Operation of surface water intakes can result in significant intake and mortality of all forms of marine life from impingement and entrainment. Depending on placement, use of subsurface intakes for desalination could cause or increase saltwater intrusion into local freshwater aquifers or change groundwater flow in the vicinity if removal of large volumes of water from an on-shore coastal aquifer hydraulically connected to a freshwater aquifer results in lowering the water levels in nearby existing freshwater supply wells in the area (WateReuse Association 2011).

As discussed in Section 7.22.2.8, *Hazards and Hazardous Materials*, maintenance of a water treatment facility requires storage and use of chemicals (e.g., coagulants, flocculants, chlorination agents and biocides) as part of the water treatment process. The accidental release of these chemicals could be transported off site by stormwater to surface water, which could adversely affect surface water quality as well as groundwater quality.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-WQ-a–j: D would avoid or minimize potential adverse effects on surface water and groundwater quality. Regulatory compliance, including applicable discharge permits and implementation provisions for desalination, would avoid or minimize potential adverse effects on surface water and groundwater quality and reduce impacts on the water quality of receiving waters and associated beneficial uses. Mitigation measures also include groundwater well requirements (if applicable), sludge management/handling, and development and implementation of a Hazardous Materials Business Plan prior to the start of operations. Until the mitigation measures are implemented, impacts remain potentially significant.

Operational effects on hydrology and water quality due to increased groundwater pumping (as might occur in brackish desalination or if groundwater was used as a water source for new drinking water treatment plants) and increased use of recycled water, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.12.1, *Surface Water,* and 7.12.2, *Groundwater*, respectively.

Other Construction Projects

Water quality impacts from new or modified boat ramps, stream gages and other monitoring devices, and water conservation projects requiring construction activities that result in ground disturbance (e.g., canal lining) would be associated with construction activities. Impacts can be mitigated through implementation of construction mitigation measures (see *Common Construction*). Once constructed, these projects would not violate water quality standards or WDRs or otherwise substantially degrade water quality because these structures would not discharge contaminants to

surface water or groundwater such that beneficial uses were adversely affected. Periodic maintenance for these types of projects, for example to calibrate or clear debris from a stream gage, would not result in any additional water quality impacts.

The potential operational effects of water conservation on water quality, as well as applicable mitigation measures to minimize or avoid these effects, are evaluated in Sections 7.12.1, *Surface Water*, and 7.12.2, *Groundwater*.

Mitigation Measures

7.22 MM-WQ-a–j: Mitigate impacts on hydrology and water quality

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction WQ Mitigation Measures (CMM-WQ-a–j)

1. **Regulatory Compliance:**

   i. Obtain and comply with all necessary permits and regulations related to waste discharge, including but not limited to, regional water board waste discharge requirements. For construction and land disturbance activities on sites larger than 1 acre, comply with State Water Board Order No. 2022-0057-DWQ (Construction General Permit), which regulates stormwater discharges from construction sites. This permit requires development of a SWPPP, which includes preconstruction and postconstruction BMPs to limit the discharge of pollutants in stormwater runoff. The BMPs would address all land- and water-based construction activities; excavation, grading, placement/removal of in-channel material; hazardous materials and waste containment and disposal procedures; and spill prevention, response, and cleanup procedures. The plan also would describe BMP inspection, monitoring, and maintenance procedures.

   ii. Obtain Clean Water Act section 404 permit and 401 water quality certifications, if necessary.

   iii. Obtain a dewatering permit from the regional water board, if necessary. Implement other BMPs as determined necessary by the regulating entity (city, county, or other state agency).

   iv. Water use must be pursuant to a valid water right.

   v. Comply with California Building Code or other applicable state and local regulations to adhere to building standards.

2. **Project Siting and Design:**

   i. Preproject assessment, planning, and design activities could include geomorphic surveys and topographic/bathymetric surveys (including evaluation of susceptibility to mudflow).

   ii. Locate projects away from areas with unsuitable soils or steep slopes.

   iii. Avoid siting roads and other permanent features near streams. New road construction will be outside of waters of the state.

iv. Avoid locating structures in a 100-year flood hazard area, to the extent feasible. If structures must be placed in a 100-year flood hazard area, perform analysis to determine whether the structure could substantially impede or redirect flood flows. If so, determine whether redesign could improve flood conveyance. To mitigate exposure to loss due to flooding, purchase flood insurance and strengthen levees if appropriate (e.g., if nearby levees are weak or project work will directly affect a levee).

v. Avoid locating projects in areas subject to seiche or tsunami.

vi. Limit any construction activities within a floodplain but above the ordinary high-water line to those actions that can adequately withstand high river flows without resulting in inundation of and entrainment of materials in flood flows.

3. **Erosion Control, Sedimentation Control, and Soil Stabilization Measures:**

i. Minimize Potential for Erosion through Project Design: Evaluate the project site and upgradient and downgradient areas for erosion potential. Locate projects away from areas with unsuitable soils or steep slopes. During construction, maintain vegetation to minimize or prevent loss of topsoil. Remove vegetation only when necessary and make every effort to conserve topsoil for reuse in revegetation of disturbed areas.

ii. Stabilize and Revegetate Disturbed Soil: Stabilize and revegetate all disturbed soil surfaces before the beginning of the rainy season. Establish native and annual grasses or other vegetative cover on construction sites immediately upon completion of work causing disturbance.

iii. Erosion Control BMPs: Implement measures to prevent soil or sediment loss. Implement general erosion control measures, such as use of hydraulic mulch, straw, polyacrylamide, temporary and permanent seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, earth dikes, drainage swales, and velocity dissipation devices. Other standard measures include prevention of runoff from construction equipment wash-down areas; installation of sediment basins and traps in conjunction with grading operations; development of slope drains; stabilization of streambanks; and installation of silt fences, gravel bag berms, sandbag barriers, storm drain inlet protection, and check dams. Monitor measures for effectiveness and maintain measures throughout the construction operations and between construction seasons.

iv. Perimeter Controls: Implement erosion control measures for the construction site perimeter, installing silt fences or placing straw wattles below slopes. Place gravel bags, silt fences, and other erosion containment along the edge of all work areas to contain particulates prior to contact with receiving waters.

v. Turbidity BMPs: Apply BMPs to minimize turbidity for construction activities in or adjacent to channels, such as the use of silt curtains, cofferdams, environmental dredges, erosion control on all inward levee slopes, and various levee-stabilization techniques—including revegetation for long-term construction sites. Apply bank stabilization BMPs, as needed, for any in-channel construction, such as maintenance of a 100-foot vegetative or engineered buffer between the construction zone and

surface waterbody. Implement turbidity monitoring during construction to maintain compliance with basin plan water quality objectives.

vi. Construction Timing: Limit any construction activities within an area of the ordinary high-water line of drainages and lakes to the dry season.

4. **Waste Management and Material Control Measures:**

i. Staging and Stockpile Management: Staging, storage, and stockpiling will occur on access roads or other previously disturbed upland areas, such as developed areas, paved areas, parking lots, areas with bare ground or gravel, and areas clear of vegetation, to avoid aquatic habitats and limit disturbance to surrounding habitats. Construction stockpiles will be covered to prevent blow-off or runoff during weather events, and concrete and scrap drywall and stucco materials will be covered when stored outside and potentially exposed to rain.

ii. Equipment Maintenance and Materials Storage: Vehicle traffic will be confined to existing roads and the proposed access route(s). All machinery must be in good working condition, showing no signs of fuel or oil leaks. Oil, grease, or other fluids will be washed off at designated wash stations, prior to equipment entering the construction site. Inspect and evaluate daily during construction for the potential of fluid leakage. No equipment refueling or fuel storage will take place within 100 feet of a body of water. All fuel and chemical storage, servicing, and refueling will be done in an upland staging area or other suitable location (e.g., barges) with secondary containment to prevent spills from traveling to surface water or drains. Project proponents will establish staging areas for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit and will be located in upland areas and at least 100 feet from bodies of water as site-specific circumstances allow. Fluids will be stored in appropriate containers with covers and properly recycled or disposed of offsite. Machinery stored on site will have pans or absorbent mats placed underneath potential leak areas.

iii. Hazardous Materials Management and Spill Response Plan: Prepare and implement a hazardous materials management and spill response plan to ensure that any hazardous materials are stored at the staging area(s) with an impermeable membrane between the ground and hazardous material and that the staging area is designed in such a way as to prevent the discharge of pollutants to groundwater and runoff water. Use and store hazardous materials, such as vehicle fuels and lubricants, in designated staging areas located away from stream channels and wetlands according to local, state, and federal regulations, as applicable. Contaminated sediments would need to be contained and transported to a waste disposal facility engineered and permitted for contaminated sediment. In the event of an accidental spill of hazardous materials, stop work, follow the spill response plan, and arrange for repair and cleanup by qualified individuals of any fuel or hazardous waste leaks or spills. (Wat. Code, § 13271.) Notify regulatory agencies within 24 hours of any leaks or spills. Properly contain and dispose of any unused or leftover hazardous products off site. Implement measures for transport, use, or disposal of hazardous materials (CMM-HAZ-a–h: 1).

iv. pH Control for In-Water Concrete Use: A dewatering plan, if applicable, will be submitted and approved by State and/or regional water boards for in-water concrete use. Avoid concrete pours during rainy weather and treat pH-impaired stormwater from construction sites in a filter or settling pond or basin, with additional natural or chemical treatment if necessary. Poured concrete will be excluded from contact with surface water or groundwater during initial curing. Confine concrete washing and spoils dumping to a designated location.

v. Trash: All refuse, debris, unused materials, and supplies that cannot reasonably be secured will be removed daily from the project work area and deposited at an appropriate disposal or storage site. All construction debris will be removed from the project work area immediately upon project completion. During project activities all trash will be properly contained within sealed containers, removed from the work site, and disposed of daily.

vi. Handling, Storage and Disposal of Dredged Material: For construction involving dredging, handling, storage, and disposal of dredged materials in accordance with permit requirements. Dredge permits are issued pursuant to several acts and regulations, including section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.) and section 404 of the Clean Water Act. Permits are issued by the regional water board, California State Lands Commission, CDFW, USACE, and USEPA. Other agencies that may participate in the permit process include NMFS and USFWS. Measures will include sediment sampling and testing prior to dredging to assess sediment quality to determine whether any additional precautions are needed for dredging operations, disposal, or beneficial reuse due to the presence of contaminants. Permits will incorporate mitigation strategies to prevent release of contaminants that could degrade water quality.

5. **In-Water Placement of Materials, Structures, and Operation of Equipment:** Material used for bank stabilization will minimize discharge sediment or other forms of waste to waters of the state. Where feasible, construction will occur from the top of the streambank or on a ground protection mat underlain with filter fabric. All materials placed in streams, rivers, or other waters will be nontoxic. Any combination of wood, plastic, cured concrete, steel pilings, or other materials used for in-channel structures will not contain coatings or treatments or consist of substances toxic to aquatic organisms (e.g., zinc, arsenic, creosote, copper, other metals, pesticides, petroleum-based products) that may leach into the surrounding environment in amounts harmful to aquatic organisms.

6. **Stream-Crossing, Culvert, and Bridge Projects:** Design stream-crossing, culvert, and bridge projects to avoid or minimize water quality impacts. Design guidelines may include, but not be limited to the following.

i. Stream-crossing projects will consider storm-proofing measures presented in the *Handbook for Forest, Ranch, and Rural Roads: a Guide for Planning, Designing, Constructing, Reconstructing, Upgrading, Maintaining, and Closing Wildland Roads* (^Weaver et al. 2015) and any subsequent editions.

ii. Bridges and culverts will be designed to adequately convey flow and materials (e.g., 100-year flood). Culverts will conform to design guidelines for conveyance of the 100-year peak flow and associated sediment and wood. If a bridge/culvert is

designed to convey less than the 100-year design flow, the project will demonstrate how the smaller culvert avoids excessive erosion/ sedimentation, headcutting, or habitat impacts.

iii. Road and stream-crossing structures will comply with current NMFS and CDFW fish passage guidelines and utilize stream simulations following NMFS Stream Simulation Design to inform project design. Structures will be designed to provide passage for all life stages of native fish species.

iv. Avoid placement of rock slope protection within the bankfull width of the stream except for the minimum necessary for protection of bridge abutments and pilings, culverts, and other stream-crossing infrastructure.

v. Drivable wet crossings will be appropriately armored on the downstream side to reduce potential for scouring.

7. **Groundwater Protection Measures:** During construction of any project that requires dewatering of groundwater resulting in a negative effect on nearby well yields, implement the following measures.

i. Install sheet piles to reduce the area influenced by shallow groundwater level declines.

ii. If sheet piles are not an option and domestic well fields are affected temporarily, truck in water to satisfy the well-user's needs.

iii. If sheet piles are not effective and the impact on the well yield is substantial such that trucking in water is not economically feasible, deepen the affected well or install a new, deeper well.

iv. Water used for construction must be pursuant to a valid water right, and recycled water will be used during construction where available (CMM-UT-a,c,f,g: 2).

8. **Drainage and Flood Protection Measures:**

i. Prepare a drainage or hydrology and hydraulic study for design of drainage-related features, such as new on-site drainage systems or new cross drainage facilities. Prepare the study in accordance with applicable standards of the Federal Emergency Management Agency, USACE, DWR, and the appropriate reclamation district, flood control agency(ies), county, and city. Design subsequent drainage features in accordance with the final study and with the applicable standards of the Federal Emergency Management Agency, USACE, DWR, and applicable flood protection agency. Based on the results of the study, design considerations could include arranging the length of any stockpiles or other construction features in the direction of the floodplain flow to maximize surface flows under flood flow conditions.

ii. Provide cross drainage, replacement drainage paths and facilities, and enlarged flow paths to reroute drainage around, under, or over the project facilities and to restore the function of any affected existing drainage or flow paths and facilities.

iii. Incorporate measures into overall drainage design that maximize infiltration/permeability and trap sediment and pollutants in stormwater runoff.

iv. Provide temporary drainage bypass facilities to reroute drainage around, along, or over the facilities and construction sites. Design the temporary bypass facilities in accordance with the results and recommendations of a drainage or hydrology and hydraulic study; temporary facilities will be in place and fully functional until long-term facilities are completed.

v. Provide on-site stormwater detention storage at construction and project facility sites to reduce project-caused short- or long-term increases in drainage runoff. Design the storage space placement and capacity based on the drainage or hydrology and hydraulic study.

vi. At instream construction sites that might reduce channel capacity, perform hydraulic studies to evaluate channel capacity and the likelihood of flooding. If necessary, modify project design or install setback levees or bypass channels to maintain channel capacity and to mitigate hydraulic impacts. Where low channel velocities might result from construction, implement a sediment management program to maintain channel capacity.

9. **Construction GEO Mitigation Measures: Blasting Operations and Safety Plan** (CMM–GEO-a–e: 7) to reduce discharges of fugitive dust, soil and other matter into surface waters and **Septic System Management Measures** (CMM-GEO-a–e: 6).

10. **Construction BIO Mitigation Measures** (CMM-BIO-a–f)

11. **Construction HAZ Mitigation Measures: Herbicide and Pesticide Use** (CMM-HAZ-a–h: 4), **Installation and Operation of Underground and Aboveground Storage Tanks** (CMM-HAZ-a–h: 15), and **Installation and Maintenance of Plumbing in Public Restrooms** (CMM-HAZ-a–h: 16)

B. Reservoirs and Points of Diversion WQ Mitigation Measures

1. **Project Planning:** Utilize the P*rinciples, Requirements and Guidelines for Water and Land Related Resources Implementation Studies* (CEQ 2013; CEQ 2014) or other appropriate planning guidance to maximize economic, environmental, and recreational benefits of a project; promote more transparent and informed decision-making; and reduce costs. Any new or modified reservoir and points of diversion would undergo extensive hydrologic modeling of operations and analysis of impacts on the aquatic ecosystem and fish species, water quality, surface water, and water supply.

2. **Feasibility Studies:** Prior to expansion or constructing a new reservoir and/or point of diversion, conduct feasibility studies to evaluate economic justification, environmental compliance, and technical standards. Conduct geomorphic surveys, topographic/ bathymetric surveys (including evaluation of susceptibility to mudflow), seismic studies, geotechnical investigations, and sediment sampling and testing. Perform hydrologic, groundwater, water temperature and other applicable water quality modeling. For a new reservoir, study alternatives including off-stream locations to avoid or minimize ecosystem disruptions (blocking migration and exchange of sediment and nutrients in the stream). Proceed with project only if analyses verify that constructing or operating a project will not result in unacceptable environmental consequences to water quality and legal users of water.

i. Water Availability Analysis: In determining the amount of water available for appropriation, the State Water Board must take into consideration the public interest and the relative benefit to be derived from all beneficial uses of the water concerned (including irrigation, municipal, industrial, recreation, and preservation and enhancement of fish and wildlife resources) and the water quality needed to protect beneficial uses (including preservation of some portion of peak flows for ecosystem processes). The project-specific environmental document will include an evaluation of a range of operating criteria that are consistent with updates to the Bay-Delta Plan, including bypass flow criteria that achieve inflows and outflows of 55 percent of unimpaired flow, with a range of 45 to 65 percent under the proposed Plan amendments and/or voluntary implementation plan.

ii. Design Criteria: If the project is determined to be feasible, develop design criteria to minimize environmental impacts. For example, for reservoirs, design the reservoir outlets at multiple elevations to provide flexibility for the depth of releases to limit the release of cyanotoxins and to control water temperature downstream of the reservoir. Reservoir outlets will be designed to safely convey flood flows that could exceed reservoir storage capacity.

3. **Regulatory Compliance:** New or modified reservoir and diversion projects must be developed and implemented in consultation with, and subject to approval from, multiple state and federal agencies. These include the State Water Board, regional water board, and DSOD (See also 7.22 MM-GEO-a–e: B1) for jurisdictional dams; fisheries agencies, including CDFW, NMFS and USFWS, USACE; and the Central Valley Flood Protection Board.

   i. Water Right Approval from State Water Board: A water right application to appropriate water by permit with the State Water Board is required. Consideration of such an application is a discretionary action that requires a determination that unappropriated water is available, a review of potential impacts on public trust resources, and a determination that the appropriation of water is in the public interest.

   ii. Water Quality Certification: Section 401 of the Clean Water Act (33 U.S.C. § 1341) requires any applicant for a federal license or permit for an activity that may result in any discharge to waters of the United States to obtain certification from the state that the project will comply with the applicable water quality requirements, including water quality standards promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Clean Water Act section 401 directs that certifications will prescribe effluent limitations and other conditions necessary to ensure compliance with the Clean Water Act and with any other appropriate requirements of state law, which includes the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.). Since reservoir and point of diversion projects involve water rights, the application for a Water Quality Certification should be submitted to the State Water Board, which will coordinate with the applicable regional water board on its processing.

   iii. Reservoir owners and operators are subject to existing regulatory requirements intended to protect water quality in reservoirs and streams below reservoirs. Consistent with California Fish and Game Code section 5937, coldwater flows from

reservoirs should be maintained and timed to provide for downstream temperatures at critical times of the year to ensure that fish below dams are kept in good condition. Additional regulatory authorities that protect coldwater habitat include FERC license requirements, NMFS biological opinion requirements, regional water board basin plan requirements for the protection of beneficial uses, and State Water Board public trust authority.

iv. Encroachment Permit: An encroachment permit from the Central Valley Flood Protection Board will be required if a project requires any construction to occur in or near a regulated stream, in a designated floodway, or on any federal flood control project levee to include the area 10-feet landward of the landside levee toe. Review and endorsement of the project may be required by local maintaining agencies (e.g., reclamation districts), which have the responsibility to maintain project levees (Federal Flood Control Project).

4. **Reservoir Operations and Management Plan:** Develop and implement a reservoir operations and management plan that, at a minimum, incorporates measures to protect and maintain water quality; prevent impacts on instream flows (7.22 MM-WQ-a–j: B5); and manage water operations, including addressing bypass flows and flood control (7.22 MM-WQ-a–j: B6) during reservoir operation. Water quality management measures will address methylmercury (7.22 MM-WQ-a–j: B8), HABs (7.22 MM-WQ-a–j: B9), and aquatic invasive species, as well as dissolved oxygen, water temperature, and other applicable water quality constituents (7.22 MM-WQ-a–j: B7) to minimize downstream water quality effects.

5. **Prevent Impacts on Instream Flows:** If operation of a new or modified reservoir and/or points of diversion could result in hydrology impacts (e.g., by reducing peak flows or reducing flows at certain times of year), the reservoir operations and management plan would include reservoir releases to prevent such impacts. This could include releases to meet Delta water quality and flow objectives or bypassing a portion of flows to preserve downstream ecological functions.

6. **Develop Flood Control Rules:** Hydrologic studies will be performed to determine how much flood control space should be reserved in the reservoir in preparation for and throughout the runoff season. These rules will protect new or modified dams from being overtopped and reduce the likelihood of downstream flooding due to high reservoir releases.

7. **National Management Measures to Control Nonpoint Source Pollution from Hydromodification:** Implement National Management Measures to Control Nonpoint Source Pollution from Hydromodification, including Management Measure 3: Erosion and Sediment Control for the Construction of New Dams and Maintenance of Existing Dams, Management Measure 4: Chemical and Pollutant Control at Dams, and Management Measure 5: Protection of Surface Water Quality and Instream and Riparian Habitat (^USEPA 2007). This guidance document provides detailed management practices to apply for each management measure appropriate to the source, location, and climate of a specific project.

8. **Methylmercury Management for New Reservoirs:** The reservoir owner or operator will implement actions to reduce the in-reservoir production of methylmercury to avoid exceeding applicable fish tissue water quality objectives protecting beneficial uses

(including applicable provisions of the State Water Board's Statewide Mercury Control Program for Reservoirs).

i. Select a reservoir site in a watershed with few or no historical mercury, gold, or silver mines; mercury mineralized zones; or other naturally mercury-enriched areas. If the reservoir site is in a watershed with historical mine sites, (a) remediate actively eroding mine sites and mining waste upstream of the site; and (b) conduct comprehensive soil mercury monitoring of reservoir inundation area and cap or remove contaminated soils prior to filling the reservoir.

ii. Conduct controlled burns or otherwise remove existing vegetation within the reservoir inundation footprint prior to initial filling of the new reservoir.

iii. Do not stock high trophic-level fish species.

iv. Implement active reservoir water chemistry and fisheries management to prevent or reduce methylmercury production by means proven feasible and effective. These methylmercury control actions will be informed by methods proven to be effective at other mercury-impaired reservoirs . Implement ongoing monitoring, including aqueous and fish tissue methylmercury, to assess the effectiveness of the control actions.

9. **Harmful Algal Bloom Management for New Reservoirs:** The reservoir owner or operator will implement a water quality monitoring program and HABs action plan to minimize the potential for adverse effects on in-reservoir and downstream beneficial uses. The plan will include visual monitoring for HABs and water quality monitoring for cyanobacteria and cyanotoxins if HABs are suspected. Monitoring will occur monthly or more frequently if HABs are suspected or confirmed. Monitoring for HABs will begin with the initial filling of the reservoir.

   During monitoring, if the presence of cyanobacteria is confirmed, reservoir water samples will be taken for laboratory analysis for cell density and the presence of cyanotoxins (specifically *microcystins, anatoxin-a*, and *cylindrospermopsin*) to determine whether the trigger levels for posting public advisory signs for planktonic (water column) and benthic HABs have been met per the guidance of the California Water Quality Monitoring Council (California Water Quality Monitoring Council 2023). The reservoir operator will coordinate with the State Water Board and the applicable regional water board regarding posting advisory warning signs corresponding to the "Caution," "Warning," or "Danger" trigger level (as applicable based on cell density and cyanotoxin concentration).

   Incorporate reservoir design features, such as release from lower elevation outlet ports to avoid high concentrations of cyanotoxins being released downstream of the reservoir. If HABs become a consistent problem near the reservoir outlet(s), additional measures may be implemented such as oxygenation of the hypolimnion to reduce the release of bottom-sediment nutrients. Reducing reservoir nutrients may reduce the potential for the formation of HABs and/or the production of cyanotoxins at concentrations exceeding the trigger levels.

10. **Construction Timing for a Dam Raise Project:** To avoid potential flooding during construction of a dam raise project, construction will occur during a prolonged period of low storage levels such that there would be no risk of overtopping, or the reservoir will

be drawn down to accommodate additional storage during construction of the dam raise.

11. **Dredging Plan:** For projects that involve dredging, develop and implement a dredging plan to ensure that contaminated sediments are contained and transported to a waste disposal facility engineered and equipped to receive contaminated sediment. Dredge permits are issued pursuant to several acts and regulations, including section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.) and section 404 of the Clean Water Act. Permits are issued by the regional water board, California State Lands Commission, CDFW, USACE, and USEPA. Other agencies that may participate in the permit process include NMFS and USFWS. Measures will include sediment sampling and testing prior to dredging to assess sediment quality to determine whether any additional precautions are needed for dredging operations, disposal, or beneficial reuse due to the presence of contaminants. Permits will incorporate mitigation strategies to prevent release of contaminants that could degrade water quality.
12. **Project Siting and Design for New or Modified Reservoirs** (7.22 MM-GEO-a–e: B2)
13. **Geotechnical Investigations for Dam Foundation and Reservoir Rim** (7.22 MM-GEO-a–e: B3)

C. Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures

1. **Well Siting:** Wells must be sited away from septic systems and other pollutant sources in a location where routine maintenance and testing can be performed on a regular schedule. New wells will not be located in groundwater basins already experiencing overdraft unless coordinated with existing SGMA plans or other managed recharge programs. In addition, new wells should not be sited where multiple aquifer zones of varying water quality are cross-connected, particularly in areas underlain by Corcoran clay.
2. **Groundwater Monitoring:** Perform a preproject survey of groundwater wells within the pumping influence area of the intake(s) and assess groundwater elevation and water quality in those wells to establish baseline data. Once the pump is operating, continue monitoring these wells to evaluate whether pumping is causing a measurable and consistent drawdown of local groundwater wells that is distinguishable from seasonal groundwater level fluctuation or measurable changes in groundwater quality. If it is determined that groundwater levels or water quality are being adversely affected by project pumping, the project proponent will coordinate with the well owner(s) to arrange for an interim water supply and begin developing a mutually agreed upon course of action to repair or deepen the affected well(s), restore groundwater yield by improving well efficiency, provide long-term water supply replacement, or construct a new well.
3. **Regulatory Compliance:**
    i. Implement DWR's California Well Standards (Bulletin 74-90), including future updates, as applicable at the time of project implementation. Well construction will be performed by contractors licensed in accordance with the provision of the Contractor's License Law (Chapter 9, Division 3, of the Business and Professions Code) unless exempted by that act.

ii. For recharge using surface water, a water right is required to capture stream flows, including peak storm events, for groundwater recharge and later beneficial use.

iii. New groundwater wells require an appropriative or overlying groundwater right and must be coordinated with existing SGMA plans or other managed recharge programs.

iv. Comply with applicable city or county ordinance establishing groundwater well siting, construction, and maintenance standards.

v. Obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of wells.

vi. For new municipal wells, comply with drinking water standards (CCR title 22, division 4).

vii. Comply with any applicable NPDES permit for low or limited threat discharges that are issued by the regional water boards for well construction dewatering, including dewatering of excavated material, and disposal of water used for pump testing.

D. Water Treatment Facilities WQ Mitigation Measures

1. **Regulatory Compliance:** Obtain and comply with all necessary permits and regulations related to waste discharge. Discharges to surface water require an NPDES permit that includes technology-based and, where appropriate, water quality-based effluent limitations. Discharges of waste to groundwater or land require WDRs. For drinking water treatment plants, comply with drinking water standards (maximum contaminant loads), in title 22 of the California Code of Regulations. For recycled water, comply with Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW).

   The use and disposal of biosolids will comply with land application and disposal requirements in 40 C.F.R. part 503. Sludge or biosolids that are disposed of in a municipal solid waste landfill or used as daily landfill cover will meet the applicable requirements of 40 C.F.R. part 258. Obtain and comply with WDRs for the land application of biosolids as a soil amendment. New sludge treatment and storage facilities must comply with the requirements of the Water Code and title 27 of the California Code of Regulations.

2. **Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures** (7.22 MM-WQ-a–j: C) (i.e., well siting, groundwater monitoring, and regulatory compliance, if applicable).

3. **Hazardous Materials Business Plan** (7.22 MM-HAZ-a–h: H1), as applicable.

4. **Desalination Facilities WQ Mitigation Measures:**

   i. Comply with the Ocean Plan to ensure the protection of beneficial uses.

   ii. Intakes: Use subsurface intakes unless evaluation determines not feasible. Subsurface intakes will not cause or increase saltwater intrusion into local freshwater aquifers or change groundwater flow in the vicinity. Surface intakes must be screened with a 1.0 millimeter or smaller slot screen when withdrawing seawater or utilize equally protective method of preventing entrainment. Minimize impingement by limiting the through-screen velocity to 0.15 meters per second (0.5 feet per second).

iii. Outfall: Discharges will not result in dense, negatively buoyant plumes that result in adverse effects due to elevated salinity or hypoxic conditions occurring outside the brine mixing zone. Design outfall structures to minimize the suspension of benthic sediments. If feasible, commingle brine with wastewater (e.g., agricultural, municipal, industrial, power plant cooling water) that would otherwise be discharged to the ocean to meet receiving water limit for salinity. If dilution is not feasible, use multiport diffusers or equally protective technology.

iv. Mitigation: In addition to minimizing intake and mortality through best available site, design, and technology, the regional water board will ensure that an owner or operator fully mitigates for the operational lifetime of the facility through a mitigation project or fee-based mitigation program.

v. Monitoring: The owner or operator of a desalination facility must submit a Monitoring and Reporting Plan to the regional water board for approval that includes, at a minimum, monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics consistent for compliance with the receiving water limitations. Receiving water monitoring for salinity will be conducted at times when the monitoring locations are most likely affected by the discharge.

7.22.2.10 Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
X. Land Use and Planning				
Would the project:				
a. Physically divide an established community	☒	☐	☐	☐
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	☒	☐	☐	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan	☒	☐	☐	☐

Section 7.13.2, *Environmental Setting*, describes the land use and planning setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Depending on the location, construction of new and modified facilities could physically divide an established community; conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or conflict with an applicable HCP or NCCP. During construction, existing land use(s) could be affected by activities such as ground clearing, increased traffic, noise, dust, and

human activity, as well as by changes in the visual landscape; these impacts are considered under the individual resource analyses (e.g., noise, aesthetics).

Construction may temporarily physically divide an established community primarily by cutting off access to roadways or bridges, thereby isolating communities, separating communities from related commercial or industrial services, or disrupting transportation and other connections between agricultural operations and communities or markets during the construction period. Roadway or bridge access could be temporarily affected if construction activities include trenching in or near roadways, for example, or construction staging in or near roadways. Siting permanent facilities within an established community (e.g., distribution pipelines, other infrastructure) could create physical barriers that could divide a community.

Inconsistencies or conflicts with land use plans, policies, or regulations typically relate to the design and density of infrastructure, resource consumption, and zoning for land use types. Depending on the location, configuration, and magnitude of the project, construction could result in a permanent change in land use that could conflict with land use plans, policies, or regulations.

If a new facility project was inconsistent with applicable land use plans, policies, or regulations, an amendment or variance from the local jurisdiction or agency approving the discretionary action may be required to be obtained by the project proponent prior to project approval and construction. Land use impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-LU-a–c: A (CMM-LU-a–c). Mitigation can include complying with all applicable zoning and land use laws and designing projects to avoid or minimize dividing established communities. Projects must comply with applicable city and county general plans and other local policies and ordinances. Site and design projects to avoid or minimize physical division of existing or established communities or residential areas by designing construction facilities and infrastructure to be located underground or with sufficient points of visual and physical access. In addition, as discussed in more detail below, implementation of Mitigation Measure 7.22 MM-LU-a–c: B can avoid or reduce potentially significant impacts on land use associated with reservoir and points of diversion projects. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of new and modified facilities are not known, impacts on land use and planning cannot be determined with certainty at this time. Therefore, potential impacts related to land use and planning remain potentially significant.

Modifications of existing facilities would be less likely to permanently physically divide an established community because the facilities already exist. Similarly, modified facility projects would likely be consistent with existing and planned land uses because the facilities already exist.

See Section 7.22.2.2, *Agriculture and Forest Resources*, for a discussion of conflicts with agricultural zoning or Williamson Act-contracted land and existing zoning for forest land or timberland. Potential conflicts with an applicable HCP or NCCP are addressed in Section 7.22.2.4, *Biological Resources*.

Section 7.13, *Land Use and Planning*, evaluates the operational effects on land use due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

As discussed in *Common Construction*, it is possible that siting and construction of new or modified reservoirs or points of diversion may temporarily physically divide an established community by cutting off access to roadways or bridges during construction, for example, or due to project siting. Projects could result in conflicts (e.g., siting and construction activities that may conflict with land designated as rural residential, open space, or timber production zone [if on private lands] or on areas managed for forestry and wildlife [if on National Forest System lands or lands administered by the Bureau of Land Management]) with existing land uses in or immediately adjacent to the project area. Modifications of existing facilities would be less likely to permanently physically divide an established community because the facilities already exist.

New reservoir projects are generally sited in areas designated as rural, open space, agricultural, or forest land. While few communities would likely be in the vicinity of potential reservoir sites, construction of a new reservoir or modification of an existing reservoir to increase storage capacity could require removal of bridges and roads that may result in the permanent physical division of an established community. These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-LU-a–c: B can avoid or reduce land use impacts associated with reservoir and points of diversion projects. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including the existing and future land use designations after a reservoir project is implemented. Feasibility studies must address impacts on structures such as bridges and roads that could be affected by reservoir construction or modification. Additional field work would identify off-site locations and haul distances for backfill materials and for disposal of waste materials to minimize disruptions to any existing communities surrounding the project construction site. Until mitigation measures are implemented, the impacts remain potentially significant.

Mitigation Measures

7.22 MM-LU-a–c: Mitigate land use impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction LU Mitigation Measures (CMM-LU-a–c)

1. **Regulatory Compliance:** Projects must comply with applicable city and county general plans and other local policies and ordinances. Implement CMM-BIO-a–f: 13 (*Compliance with HCPs and NCCPs*), if applicable. If a project is located on public land, comply with any applicable resource management plan. If a project is located in the Delta, pursuant to the Delta Reform Act, the lead agency will ensure project compliance with the Delta Plan, as applicable (i.e., if the project is a "covered action" as defined by Wat. Code, § 85057.5(a)).
2. **Project Siting and Design:** Site and design projects to avoid or minimize physical division of existing or established communities or residential areas by designing construction facilities and infrastructure to be located underground or with sufficient points of visual and physical access. Examples of methods of minimizing physical division include, but are not limited to, the following actions.

i. Bury or visually mask construction infrastructure or facilities.

ii. Restore disturbed landscapes to preconstruction conditions.

iii. Implement other feasible mitigation to reduce the disturbance to a community's physical composition, visual character, or other features integral to the community's identity.

iv. Notify all affected persons (for example, residents, property owners, school officials, business owners) in the project vicinity of the construction plans and schedules. This could include arranging schedules for road detours with residents and businesses to maintain access to homes, schools, and businesses, as well as providing protection, relocation, or temporary disconnection of utility services.

v. Minimize the amount of permanent easement required for construction of facilities and consult with property owners to select easement locations that would lessen property disruption and fragmentation, if applicable.

vi. Relocate roads prior to project construction to ensure continued access through the project vicinity.

3. **Traffic Management Plan** (CMM-TRA-a,b,d–f: 3)

B. Reservoirs and Points of Diversion LU Mitigation Measures

1. **Feasibility Study**: Land use impacts from new reservoir development must be considered and addressed in a feasibility study, including consideration of existing and future land use designations. The impacts on structures such as bridges and roads affected by new reservoir development must be addressed in the feasibility study, and the project must not result in the physical division of an established community.

2. **Minimize Community Disruption due to Hauling/Disposing of Construction Waste:** Identify off-site locations and haul distances for excavation or other materials and for disposal of waste materials to avoid or minimize disruptions to communities near the project construction site.

3. **Provide Appropriate Land Compensation:** Compensate at the minimum mitigation ratio of 1:1 land required by the applicable local jurisdiction to offset the loss with a preference for land contiguous with other existing open space or agricultural property.

4. **Project Planning** (7.22 MM-TRA-a,b,d–f: B1)

5. **Reservoirs and Points of Diversion REC Mitigation Measures** (7.22 MM-REC-a,b: B).

7.22.2.11 Mineral Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XI. Mineral Resources				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan	☒	☐	☐	☐

Section 7.14.2, *Environmental Setting*, describes the mineral resources setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Depending on location, construction of new and modified facilities could result in the loss of availability of a known mineral resource of value to a region and residents of the state or of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Construction of large-scale projects could affect mineral resources of statewide or regional importance (i.e., in Mineral Resource Zone 2 [MRZ-2] areas as designated by the State Mining and Geology Board) or locally important mineral resource recovery sites by making the resource inaccessible for extraction. For example, if land at or near a site selected for a new or modified facility is designated as an MRZ-2 area (i.e., an area known to contain mineral resources), that land could become unavailable for mineral extraction as a result of construction on that land. Active mines and areas zoned as MRZ-2 occur in nearly all counties of the state, and many active mines and MRZ-2 areas occur near waterways on the alluvial floodplains because of the high-quality aggregate found in this depositional environment.

Construction of new or modified facilities could occur in areas with active natural gas, oil, or aggregate production or the potential to contain untapped reserves of those resources. Siting/construction of a project that substantially restricts access to underlying mineral resources, including oil and natural gas, could also result in temporary or permanent loss of availability of the mineral resource. For example, implementation of some projects (e.g., new reservoirs) could entail permanent inundation of areas containing natural gas extraction wells or aggregate resources. While natural gas wells can remain productive in flooded areas, these wells may require modification (e.g., construction of a protective cage and platform above the well) or abandonment and relocation. In some cases, extraction could continue, or pad sites could be designated for future extraction. In other cases, resources could be accessed from wells off site using horizontal drilling techniques. Impacts on mineral extraction sites would be temporary if effects were limited to the period of construction, such as could occur if access to a mining operation was temporarily restricted. Impacts would be permanent if the built project itself interfered with extraction of the mineral resource.

In addition, construction demand for aggregate (e.g., concrete) for some projects could exceed local supplies. For example, construction of new dams or dam raises at new or modified reservoir sites would require large quantities of construction aggregate, which could limit the ability of other aggregate users in the area to obtain and use aggregate.

Impacts on mineral resources associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-MIN-a,b: A (CMM-MIN-a,b). Mitigation can include designing and locating new and modified facilities to minimize interference with access to active oil and gas wells and any gravel or sand mines. If mitigation measures are implemented, many impacts can be mitigated to less than significant.

Because the precise location and magnitude of activities required for new and modified facilities are not known, mineral resource impacts cannot be determined with certainty at this time. Therefore, potential impacts on mineral resources remain potentially significant.

Section 7.14, *Mineral Resources*, evaluates the operational effects on mineral resources due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

Mitigation Measures

7.22 MM-MIN-a,b: Mitigate impacts on mineral resources

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction MIN Mitigation Measures (CMM-MIN-a,b)

1. **Project Siting and Design:**
    i. Design and locate projects to avoid displacement of and maintain access to active oil and gas wells or aggregate resource sites, to the extent feasible.
    ii. Avoid siting projects on land designated for ongoing or potential mineral extraction, either on a California Geological Survey Mineral Land Classification Map as MRZ-2 or -3 or zoned in a general plan for mining.
    iii. Ensure land use compatibility between existing mineral resource extraction activities and projects, activities, or actions that may be implemented.
    iv. If the project is located in the vicinity of designated MRZ-2 sectors, maintain adequate buffer distance.
    v. Establish designated work areas to ensure that they are not located within a state- or locally designated mineral resource area. Confine construction traffic to designated access roads and staging areas.
2. **Aggregate Use:**
    i. Limit use of construction aggregate to local sources with sufficient capacity to meet both project and future local development needs.
    ii. Use recycled aggregate, where possible, to decrease the demand for new aggregate.
3. **Access to Extraction Sites:** Ensure that access is maintained to existing, active mineral resource extraction sites during project construction.

4. **Implement the California Department of Conservation's Geologic Energy Management Division's (CalGEM) Recommendations:** Implement recommendations identified in CalGEM's Construction Site Well Review Program in coordination with local CalGEM district office.

7.22.2.12 Noise

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XII. Noise					
Would the project result in:					
a.	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	☒	☐	☐	☐
b.	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	☒	☐	☐	☐
c.	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project	☒	☐	☐	☐
d.	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project	☒	☐	☐	☐
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	☒	☐	☐	☐
f.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels	☒	☐	☐	☐

Section 7.15.2, *Environmental Setting*, describes the noise and vibration setting, and additional regulatory information is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Construction activities associated with new or modified facilities could temporarily (1) generate noise levels in excess of standards established in local general plans, noise ordinances, or applicable standards; (2) generate groundborne vibration or groundborne noise; and (3) increase ambient noise levels in the project vicinity. In addition, depending on project location, construction crew members may be temporarily exposed to excessive noise levels in the project area from a nearby public or private airport or airstrip during project construction.

Noise impacts from construction come from the use of heavy construction equipment at the construction site. Heavy construction equipment includes excavators, graders, scrapers, bulldozers,

backhoes, pile drivers, jackhammers, and concrete mixing and pumping trucks. Small-scale projects would require the use of heavy construction equipment over a shorter period and would potentially require fewer pieces of equipment. Large-scale projects, on the other hand, could have longer periods during which this type of equipment is used and may require larger and potentially louder construction equipment. Actual noise exposure levels would depend on the intensity of the construction activity and the distance between sensitive receptors and the noise source. Applicable noise standards for construction would be those specified by county or city ordinance or general plan.

Because of its temporary nature, construction does not result in a substantial permanent increase in ambient noise levels but may result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity. The use of heavy construction equipment can generate noise levels in excess of standards established in a jurisdiction's general plan or municipal code or applicable standards of other agencies. Some city municipal codes or county codes of ordinances have exemptions for construction noise during daytime hours.

Where noise-sensitive receptors are located near a construction site, they may be exposed to noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies, or to a substantial temporary increase in ambient noise. Residential uses, schools, hospitals, places of worship, parks, and natural preserves are among the most common noise-sensitive receptors. Noise attenuation due to distance, atmospheric effects, ground absorption, and terrain effects would reduce noise effects on noise-sensitive receptors to some extent.

Construction activity can result in varying degrees of groundborne vibration, depending on the equipment and method used. Operation of heavy construction equipment, particularly pile driving and other impact devices such as pavement breakers and jackhammers, creates seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. The use of equipment such as pile drivers, vibratory compactors, and jackhammers could generate groundborne vibrations ranging from 0.035 to 1.518 inches per second peak particle velocity at 25 feet, with the range representing the maximum amplitude and frequency of vibration waves that could be caused by these types of equipment (^FTA 2018). Actual exposure levels would depend on the distance between receptors and the vibration source. Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. Vibration may inhibit general well-being and contribute to stress and annoyance and can interfere with human activities including sleep, speech, recreation, and tasks demanding concentration or coordination. At moderate and high levels, groundborne vibration may result in detectable vibrations and slight damage to nearby structures. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster, stucco coatings). Vibration rarely results in damage to structural components. At sufficiently high amplitudes, propagation of vibration waves through the ground can cause building elements to vibrate at a frequency that is audible to the human ear. Groundborne noise could result in rattling of windows, walls, or other items coupled to building surfaces. Within the range of expected amplitude, groundborne vibrations would pose the greatest risk to extremely fragile historic structures (buildings, ruins, ancient monuments), fragile buildings, historic structures (buildings, bridges, gates, weirs, and other levee structures that are more than 50 years old) and some newer structures (less than 50 years old but not constructed to current building standards).

Construction, depending on project location, may temporarily expose construction crew members to excessive noise levels in a project area from a nearby public or private airport or airstrip during project construction.

Noise and vibration impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-NOI-a–f: A (CMM-NOI-a,b,d–f). Mitigation for potential construction noise and vibration impacts can include complying with regulations related to noise, implementing noise-reducing construction measures, and designing projects to limit groundborne vibration from construction equipment like pile drivers and jackhammers. If these mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, noise and vibration impacts cannot be determined with certainty at this time. Therefore, potential noise and vibration impacts remain potentially significant.

New or Modified Facilities

Operation and maintenance of new or modified facilities (except other construction actions) could generate noise, including permanent or periodic increased ambient noise, through operation of intakes and conveyance facilities; use of transformers, generators, fans, groundwater well pumps and other pumps, and alarms; and increased traffic, particularly for new reservoirs allowing recreation. Facilities can operate 24 hours a day and may increase operations-related noise during peak use and emergencies. This increase could be a permanent or periodic increase in ambient noise, including nighttime noise and noise in excess of local standards.

The permanent or periodic increase of ambient noise associated with operation of new or modified facilities can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-NOI-a–f: B (NOI-a,c,d). If mitigation measures are implemented, many impacts can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, noise and vibration impacts cannot be determined with certainty at this time. Therefore, these potential noise and vibration impacts remain potentially significant.

Operation and maintenance of new or modified facilities likely would not result in exposure of sensitive receptors to or generation of excessive groundborne noise or vibration levels. Unless energy is being imparted into the ground (e.g., pile driving), vibration generated by most activities is relatively minor and would not occur at a perceptible level. Permanent facilities can include operation of mechanical equipment (e.g., pumps and generators) and minor increases in daily vehicle traffic associated with staff. However, pumps and generators generally are not a significant source of vibration (as they do not impart energy into the ground), and rubber-tired vehicles are not a significant source of vibration (because rubber tires provide vibration isolation). For example, although groundwater pumps could generate intermittent and localized vibration, it would likely not be perceptible at distances beyond 25 feet. New or modified facilities would not likely be located in proximity to noise-sensitive land uses (e.g., residential).

The effects of construction-related noise and groundborne vibration on wildlife are evaluated in Section 7.22.2.4, *Biological Resources*.

Section 7.15, *Noise*, evaluates the operational noise effects due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water

transfers, water recycling, and agricultural and municipal conservation measures, and presents applicable mitigation measures to minimize or avoid these effects.

Mitigation Measures

7.22 MM-NOI-a–f: Mitigate noise and vibration impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction NOI Mitigation Measures (CMM-NOI-a,b,d–f)

1. **Regulatory Compliance:** Comply with applicable state and local noise policies and regulations. Comply with Cal/OSHA standards related to occupational noise exposure (Cal. Code Regs., tit. 8, § 5096).
2. **Noise-Reduction Measures:** Implement noise-reducing construction measures such that noise from construction does not exceed applicable local noise standards or limits specified in the applicable county or city ordinances and general plan noise elements. Such measures may include the following.
    i. Restrict construction activities near noise-sensitive (e.g., residential) land uses to daytime hours on weekdays.
    ii. Prior to construction, the contractor will identify noise-sensitive receptors near a project site. At least 2 weeks prior to start of construction, the contractor will notify all property owners within 1,000 feet of the project site that construction activities are scheduled to commence.
    iii. Where construction occurs near residences, the contractor will provide local residents with a noise complaint hotline phone number, and noise complaints will be promptly addressed.
    iv. Maintain construction equipment to manufacturers' recommended specifications and equip all construction vehicles and equipment with appropriate mufflers and other approved noise-control devices, and/or use newer equipment with improved noise muffling. Ensure that all equipment items have the manufacturers' recommended noise abatement measures, (e.g., mufflers, engine covers, engine vibration isolators) intact and operational. Newer equipment will generally be quieter in operation than older equipment. Inspect all installation equipment at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers, shrouding).
    v. Shroud or shield all impact tools, to the extent feasible.
    vi. Locate all stationary noise-generating equipment (e.g., compressors) as far as possible from adjacent occupied offices, residents, or sensitive habitats (if they are adjacent to the project site).
    vii. Limit idling of construction equipment to reduce the time that noise is emitted.
    viii. Use temporary noise barriers or curtains along construction boundaries or partial enclosures around continuously operating stationary equipment.

ix. Use the shortest possible routes from construction sites to local freeways for truck delivery routes, except when selecting routes to avoid going through residential neighborhoods.

x. Establish an active community liaison program that notifies landowners within 300 feet of construction areas of the construction schedule, in writing, prior to construction to keep them informed of schedule changes; designate a disturbance coordinator for the construction site.

xi. Monitor construction noise and vibrations and modify and/or reschedule construction activities if monitoring determines that maximum limits set by local or regional noise ordinances are exceeded.

xii. Conduct individual traffic noise analysis of identified haul routes and provide mitigation at locations where noise standards cannot be maintained for sensitive receptors.

3. **Vibration-Reduction Measures:** Measures to limit or minimize exposure of persons to or generation of excessive groundborne vibration or groundborne noise may include the following.

   i. Design projects to limit vibration from construction equipment to comply with the applicable local standards or commonly accepted thresholds.

   ii. Conduct a preliminary groundborne vibration analysis report to determine future construction-related groundborne vibration levels based on, but not limited to, a detailed equipment list, hours of operation, and distances to sensitive receptors located within 500 feet of project sites. If preliminary analysis determines that groundborne vibration would expose sensitive receptors to significant impacts in excess of local standards, implement the following actions.

      - Designate a complaint coordinator and post this person's contact information in a location near construction areas where it is clearly visible to the nearby receptors most likely to be affected.
      - Conduct vibration monitoring before and during vibration-generating operations occurring within 100 feet of historic structures. Make every attempt to limit construction-generated vibration levels during pile driving and other groundborne noise and vibration-generating activities near the historic structures.
      - Cover or shore adjacent historic features, as necessary, for protection from vibrations, in consultation with the appropriate local or state cultural resources authority.
      - For pile driving required within a 50-foot radius of residences, use alternative installation methods where feasible.
      - Conduct any pile-driving activities close to sensitive receptors only during daytime hours.
      - Use small equipment that generates less vibration when equipment must be used close to sensitive uses.

4. **Blasting Operations and Safety Plan (CMM-GEO-a–e: 7):** Implement BMPs to reduce short-term noise and vibration impacts.

5. **Construction near Airports (CMM-HAZ-a–h: 8):** Implement BMPs to avoid safety hazards for people residing or working in the project area.

B. Reservoirs and Points of Diversion, Groundwater Wells and Groundwater Storage and Recovery, and Water Treatment Facilities NOI Mitigation Measures (NOI-a,c,d)

1. **Noise-Reduction Consideration in Project Design and Operations:** Prepare an acoustical study and include noise-reduction measures in project design so that operational noise from stationary equipment does not exceed applicable local noise standards or limits specified in the applicable county or city ordinances and general plan noise elements. Noise-reduction measures to be implemented, as necessary, based on the results of the acoustical study may include using quiet technology and acoustic shielding, locating equipment away from sensitive receptors, outfitting equipment with noise-reduction devices, enclosing pumps and other noise-generating machinery in enclosures that reduce the operating noise, and incorporating dense landscaping to shield operational noise sources.

2. **Operational Truck Traffic Noise:** Design and implement measures to reduce operational truck traffic noise, such as locating haul routes away from sensitive receptors, limiting truck speed, and installing noise barriers near sensitive receptor locations.

7.22.2.13 Population and Housing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIII. Population and Housing				
Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	☐	☐	☒	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere	☐	☐	☒	☐
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	☐	☐	☒	☐

Section 7.16.2, *Environmental Setting*, describes the population and housing setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

During construction of new and modified facilities, non-locals may move to a project area to support these activities; however, construction employees are generally pulled from the region's existing labor pool and typically do not relocate when assigned to a new construction site. Those who are

hired from outside of the existing labor pool generally tend to commute to jobsites, as projects can change several times a year and offer no permanent place of business. Some more specialized construction workers may be needed and potentially would relocate to the construction area; however, relocation by specialized workers is usually temporary and limited to the duration needed to complete a particular phase of construction that requires their skills. The need for lodging would be temporary and could likely be met via local accommodations (e.g., motels). Construction of new or modified facilities may be as short as a few days or as long as several years, depending on the specific project being constructed. As such, worker relocation could vary depending on the size, type, and length of construction activities. Once that construction phase is completed, specialized workers typically move onto the next jobsite requiring their skills. Operation of new facilities would not require extensive staff; and operation of modified facilities would likely add few to no staff, therefore limiting the need for onsite housing.

New or modified facilities do not involve construction of new homes or businesses, extension of roads, other infrastructure, or other actions that may directly or indirectly induce substantial population growth in an area. Further, these projects would not develop amenities (e.g., malls, amusement parks, hotels) that would attract substantial numbers of people to an area. This analysis assumes that new or modified facilities may be developed in reaction to reduced Sacramento/Delta surface water supply and does not consider projects that would increase water supply to support additional growth and population increases. Growth-inducing effects are discussed in Section 7.23, *Cumulative Impact Analysis, Growth-Inducing Effects, and Significant and Irreversible Changes*. General plans set out the long-term growth projections for cities and counties; city/county urban water management plans use the general plan projections to determine whether there are sufficient water supplies and to identify any shortfalls and means of meeting those shortfalls. Water reliability is not expected to cause substantial population growth because it is expected that these projects would be included in the local general plan projects and that any growth related to water reliability would be consistent with the local general plan and would be incorporated into land planning decisions. Job creation is also not expected to cause substantial population growth because new or modified facility projects do not require extensive staff and therefore would add few jobs.

Regarding recreation, new and modified reservoirs could involve camping, hiking, swimming, non-motorized or motorized boating, jet skis, and hunting and angling. Depending on the size of the reservoir, there is potential that new local small businesses (e.g., marinas, house boats, tent campgrounds, campgrounds with recreational vehicle utility hook ups, general-purpose stores) could be located on site or nearby. These recreational and business amenities would be expected to draw seasonal recreational users and some permanent residents to the area but not at a level to generate substantial local population growth.

In most locations, new or modified facilities would not displace people or existing housing or necessitate construction of replacement housing elsewhere because the facilities would be in relatively remote areas or within the footprint of existing project facilities or industrial areas. However, if houses are present in the inundation area of a new reservoir, those homes and people would be permanently displaced. Because of the remoteness of the reservoir project areas, it is expected that the number of displaced houses and people would be small and would not result in a housing shortage or cause increased demand in another community. Impacts related to population and housing from construction and operation of new or modified facilities would be less than significant.

Section 7.16, *Population and Housing*, evaluates the operational effects on population and housing due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

7.22.2.14 Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIV. Public Services				
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks? *(see Recreation section for discussion of parks)*	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

Section 7.17.2, *Environmental Setting*, describes the public services setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

The need for additional public services (e.g., fire protection, police protection, libraries, parks, schools, other public facilities) or the deterioration of existing public services such that new or physical modifications to government facilities would be required typically results from new development and an increase in the local population. As a location's population increases, the need for additional or new public services and public service facilities generally increases. As discussed in Section 7.22.2.13, *Population and Housing*, new or modified facilities would not result in increases in housing or in population where implemented. As such, these types of projects would not create a need for additional schools, parks, or other public facilities.

Construction activities for new and modified facilities could result in temporary, short-term increased response times for fire, police, and other emergency responders due to increased construction traffic and potential road closures and detours. Potential road detours or closures due to construction activities and the associated potential traffic congestion could make areas in the near vicinity of construction temporarily inaccessible or less accessible to emergency services. This may temporarily increase emergency response times. Construction activities could also temporarily increase the need for traffic patrol and emergency route management. However, these would be temporary impacts and would not necessitate the need for new or physically altered governmental

facilities to maintain acceptable service ratios, response times, or other performance objectives for any public services.

Construction actions could result in temporary increases in the number of fire, police, or emergency medical provider service calls in the vicinity of work sites from emergencies related to construction. However, these potential increases in calls are not expected to be large enough or frequent enough to affect response times beyond the regular variation experienced by providers of emergency services. Operation would require maintenance activities. Routine maintenance activities would not result in substantially adverse physical traffic impacts that would lead to increased response times for fire protection, police protection, schools, and other public facilities.

Any potential increase in demand for emergency services would be temporary and would not result in the need for new or physically altered governmental facilities to maintain acceptable service ratios, response times, or other performance objectives. Therefore, impacts on public services due to construction and operation of new and modified facilities would be less than significant.

Mitigation for potential construction-related interference with emergency access due to traffic, road closures, and detours is presented in Section 7.22.2.16, *Transportation and Traffic*. Mitigation for potential increases in emergencies related to construction is presented in Section 7.22.2.8, *Hazards and Hazardous Materials*. Mitigation for potential recreation impacts is presented in Section 7.22.2.15, *Recreation*.

Section 7.17, *Public Services*, evaluates the operational effects on public services due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

7.22.2.15 Recreation

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XV. Recreation					
a.	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b.	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

Section 7.18.2, *Environmental Setting*, describes the recreation setting. The regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Recreationists near an active construction site could be affected by construction-related traffic, visual impacts, water quality effects, noise, fugitive dust, and exhaust emissions from heavy

equipment. These construction-related environmental effects could temporarily affect recreational activities (e.g., disrupt wildlife viewing, swimming, picnicking), as well as result in a decrease in the quality of recreational experiences in the immediate vicinity of the construction site and at nearby facilities (e.g., river access, trails, private parks not directly affected by construction). The potential for effects on recreation could be greater for new or modified facilities constructed along waterways—locations popular for many types of recreational activities (e.g., boating, swimming, fishing, hunting, hiking, wildlife viewing). Depending on the duration of construction and the degree to which nearby recreational activities are affected, recreationists may choose to use alternate existing neighborhood and regional parks or other recreational facilities. Substantial physical deterioration of the alternate recreational facility could occur if long-term construction activities (i.e., occurring over multiple years) were occurring and a substantial number of recreationists were affected.

Recreational activities in the vicinity of project construction sites could also be affected by potential access restrictions during construction, such as temporary closure of recreational areas or trails. Such closures could be short-term for some projects but could last several years for large projects. Due to these potential effects on recreational experiences, recreationists may choose other locations that provide similar opportunities for recreation, which could ultimately result in physical deterioration of these alternative locations and facilities over time. This would be a potentially significant impact that would be more likely to occur under large construction projects that require substantially longer than 1 year to construct and in areas where alternative recreational areas are limited.

Impacts on recreation associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-REC-a,b: A (CMM-REC-a,b). Mitigation can include continuing service at the existing recreation facility, using appropriate signage and river markers, providing signage for route relocations, installing waterway markers and buoys to protect boater safety, and rehabilitation or restoration of degraded facilities promptly upon completion of construction. Construction mitigation measures for impacts on other environmental resources, including measures for aesthetics (CMM-AES-a–d), air quality (CMM-AQ-a–e), water quality (CMM-WQ-a–j), noise and vibration (CMM-NOI-a,b,d–f) and transportation and traffic (CMM-TRA-a,b,d–f), would minimize effects on recreation. In addition, as discussed in more detail below, implementation of Mitigation Measures 7.22 MM-REC-a,b: B and C can avoid or reduce additional potentially significant impacts on recreational resources associated with new or modified facilities. If these mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, impacts associated with recreation cannot be determined with certainty at this time. Therefore, potential impacts on recreation remain potentially significant.

Section 7.18, *Recreation*, evaluates the operational effects on recreation from increased groundwater pumping and other water management actions (groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures), using existing facilities and infrastructure, and presents any applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Construction of new or modified reservoirs and points of diversion would result in short-term and long-term effects on recreation in addition to the potential effects related to construction activities described above (see *Common Construction*). Following construction, larger reservoirs and new points of diversion facilities could restrict recreation in the vicinity of the diversion because of a need for a safety zone around the facility. Reservoirs and points of diversion may also alter water levels and flow in such a way that they adversely affect boating and fishing areas, public and private recreational facilities, or waterways used for recreation. The possible displacement of recreationists to other locations could result in accelerated physical deterioration of some recreational facilities (e.g., more popular recreational sites) over time.

New reservoirs would likely involve development of reservoir-associated recreation facilities (e.g., boat facilities, campground). Depending on the size of the reservoir, new local small businesses (e.g., marinas, houseboats, tent campgrounds, campgrounds with recreational vehicle utility hook ups, general-purpose stores) could be located on site or nearby. These recreational and business amenities would be expected to draw recreational users. These new recreation opportunities would be a benefit to recreational use in the vicinity of the new surface water storage facilities.

New or modified on-stream reservoir projects could inundate areas previously used for recreation associated with streams as well as additional infrastructure. Infrastructure affected by a new or modified on-stream reservoir may include boat docks, boat haul-out locations, and possibly campgrounds and campsites, day-use sites, roads/trails, and off-highway/off-road vehicle routes. These changes could adversely affect recreation (e.g., hiking, fishing, hunting, wildlife viewing, swimming, boating opportunities) as well as the amount of shoreline available for recreation. New and modified on-stream reservoir projects also could affect flow-dependent activities such as canoeing or whitewater rafting. Potential changes in flows due to new or modified reservoirs may affect recreational opportunities at certain locations and at certain times of the year. This could result in an increase in the use of put-in and other facilities on other rivers that remain available for whitewater activities, which could cause substantial physical deterioration of the facilities. Potential impacts on recreation may be less substantial for implementation of off-stream reservoirs (because they would not impede or inundate a natural stream) and for expanded reservoirs (because these facilities would be associated with an existing reservoir).

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-REC-a,b: B could avoid or reduce additional impacts on recreation associated with large new or modified reservoir and points of diversion projects. Preproject planning for large reservoirs requires consideration of a wide variety of technical, environmental, social, political, and economic issues. Feasibility studies must address impacts on recreation such river kayaking, white-water rafting and boat facilities, campground facilities and roads/trails, and other infrastructure that could be affected. Engineering designs and construction plans will include any special accommodations for recreation impacts and opportunities, including the need to relocate facilities and create new recreation opportunities once reservoir development is complete. A project-specific analysis would be necessary for an individual project, and multiple approvals from various federal and state agencies would be required. Measures require that, to the extent feasible, new points of diversion would be sited and designed to minimize disturbances to or losses of existing established recreational areas. Where long-term impacts on existing facilities are unavoidable, the project proponent would compensate for impacts through mitigation, restoration, or creation of additional permanent new replacement facilities.

Until these potential mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery Projects

Groundwater well development and groundwater storage and recovery projects could temporarily affect recreation, primarily due to construction, if the well or well field site is near or affects access to recreation areas (see *Common Construction*). New groundwater wells and groundwater storage and recovery projects would not be expected to permanently affect recreation because these projects are not located in areas used for recreation. Groundwater storage and recovery projects are typically located in agricultural areas that are not open to recreation, or they are designed to prevent displacement of recreational areas.

Water Treatment Facilities

Recreation impacts from development of water treatment facilities, including desalination plants, or water recycling facilities at WWTPs are primarily associated with siting and construction activities, if the project sites are near or affect access to recreation areas (see *Common Construction*).

Construction or modification of new WWTPs could result in new permanent foul odor sources that smell like rotten eggs, ammonia, or garlic. Generally, these odors originate from the anaerobic decomposition of organic compounds (WaterWorld 2016). If a new WWTP was located near an established recreational area (e.g., park), recreationists may choose other locations that provide similar opportunities for recreation, which could ultimately result in accelerated physical deterioration of these alternative locations and facilities over time. This would be a potentially significant impact. Development and implementation of an odor management plan and regulatory compliance (7.22 MM-AQ-a–e: C) can avoid or minimize this impact to less than significant. Until mitigation measures are implemented, the impacts remain potentially significant.

Water treatment facilities and recycled water facilities could include recreation benefits, such as a visitor center, trails, or educational signage. However, these facilities would not increase the population or draw people to an area; therefore, these facilities would not result in substantial adverse physical impacts on existing parks or recreational facilities or create the need for new or expanded parks or recreational facilities.

Other Construction Projects

Construction associated with other construction projects (i.e., boat ramps, stream gages and other monitoring devices, and other conservation projects) could temporarily affect recreation (see *Common Construction*). These projects would not be expected to have long-term effects because recreational opportunities where these projects would be implemented would benefit or not be substantially permanently changed.

Modifications or extensions of boat ramps would provide a benefit for recreation at reservoirs where access to the water became limited due to lowered water levels. These modifications would be expected to allow continued use of an existing facility rather than creating a need for recreationists to use alternative facilities at the same reservoir or to seek out recreation opportunities at other locations.

Modifications to agricultural canal lining or encasement could reduce the numbers of sport fish in a canal. However, this is unlikely to displace a large number of fisherpersons such that substantial physical deterioration of another recreational fishing site or sites would occur or would be accelerated.

Mitigation Measures

7.22 MM-REC-a,b: Mitigate impacts on recreation

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction REC Mitigation Measures (CMM-REC-a,b)

1. **Project Siting and Design:** Site and design construction project to minimize disturbances to or losses of existing recreational areas and associated facilities.
2. **Maintain Access to Existing Recreational Facilities during Construction:** If feasible, maintain access to the affected recreational site/facilities by providing appropriate signage for route relocations, including as appropriate, river markers. Provide additional operations and maintenance of existing recreational facilities to prevent deterioration.
3. **Coordinate with Public and Private Recreation Providers:** If substantial temporary or permanent impairment, degradation, or elimination of recreational facilities causes recreationists to be directed toward other existing facilities, the project proponent will coordinate with affected public and private recreation providers to direct displaced users to under-utilized recreational facilities. Provide temporary replacement facilities of equal capacity and quality.
4. **Rehabilitate or Restore Degraded Recreational Facilities or Provide Replacement Recreational Facilities:** Where impacts on existing facilities are unavoidable, compensate for impacts through mitigation, restoration, or preservation off site or creation of additional permanent replacement facilities. For construction of new recreational facilities, site the project in area that would have minimal adverse physical effect on the environment. If modification of existing facilities or construction of new facilities is required, implement all construction mitigation measures identified in this section. Facilities with fueling stations or restroom facilities must implement additional construction and operational mitigation measures.
5. **Construction AES Mitigation Measures** (CMM-AES-a–d)
6. **Construction AQ Mitigation Measures** (CMM-AQ-a–e)
7. **Construction WQ Mitigation Measures** (CMM-WQ-a–j)
8. **Construction NOI Mitigation Measures** (CMM-NOI-a,b,d–f)
9. **Construction TRA Mitigation Measures** (CMM-TRA-a,b,d–f)

B. Reservoirs and Points of Diversion REC Mitigation Measures

1. **Project Siting and Design:** Site and design new or modified on-stream and off-stream reservoirs and/or points of diversion to minimize disturbances to or losses of existing recreational areas and associated facilities (e.g., campgrounds, parks, associated roads,

marinas) and implement methods to maintain access to adjacent areas or to recreational areas that could be affected by new points of diversion facilities.

2. **Project Planning:** Where unavoidable, the impacts on recreation from reservoir development and new or changed points of division will be considered and addressed in a feasibility study as part of the project planning phase. Include contingency planning for recreation in performance monitoring and adaptive management (up to 5 years) after development and consider transportation impacts and needs associated with recreation facilities.
3. **Coordination with Public Recreation Providers:** For reservoir and/or points of diversion projects that would displace recreationists to other similar facilities (e.g., rivers and adjacent land-based recreation) such that substantial deterioration or accelerated deterioration of those facilities may occur, the project proponent will coordinate with affected public recreation providers to direct displaced users to under-utilized recreational facilities, provide additional operations and maintenance of existing recreational facilities, or otherwise compensate the provider to prevent deterioration or accelerated deterioration of affected facilities.
4. **Compensate for Impacts on Recreational Facilities:** Where long-term impacts on existing facilities are unavoidable, the project proponent will compensate for impacts through mitigation, restoration, or creation of additional new permanent replacement facilities. If modification of existing facilities or construction of new facilities is required, implement all construction mitigation measures identified in this section (7.22). Facilities with fueling stations or restroom facilities must implement additional construction and operational mitigation measures.
5. **Construction WQ Mitigation Measures** (CMM-WQ-a–j)
6. **Construction BIO Mitigation Measures** (CMM-BIO-a–f)

C. Water Treatment Facilities REC Mitigation Measures

1. **Water Treatment Facilities AQ Mitigation Measures** (7.22 MM-AQ-a–e: C)

7.22.2.16 Transportation and Traffic

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVI. Transportation/Traffic				
Would the project:				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
b.	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways	☒	☐	☐	☐
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	☐	☐	☐	☒
d.	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	☒	☐	☐	☐
e.	Result in inadequate emergency access	☒	☐	☐	☐
f.	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	☒	☐	☐	☐

Section 7.19.2, *Environmental Setting*, describes the transportation and traffic setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

Construction of new or modified facilities, could result in conflicts with adopted policies, plans, or programs established for the performance of the circulation system or related to public transit, bicycle, or pedestrian facilities, along with applicable congestion management programs, or could result in an increase to roadway hazards or inadequate emergency access.

Construction activities would introduce additional vehicles (e.g., construction vehicles, construction workers' personal vehicles) on roads near project sites. For example, projects may require import or export of fill and building materials to or from a project site; depending on the volume required to be transported, these trips could generate a substantial temporary increase in the number of vehicles or trucks at intersections and on road segments not designed to accommodate the increased traffic levels. Roads may need to be relocated, which could cause new rerouted traffic at an intersection not designed to accommodate additional traffic. Increased traffic congestion due to construction activity on roads and at intersections could result in transportation facilities operating below minimum level of service standards. In addition, if the use of a substantial number of haul trucks or trips is required for fill or building material transport, for example, roads could be substantially degraded such that repairs would be required. Further, some projects could require temporary relocation or closure, or complete removal, of existing bicycle and pedestrian paths and trails, depending on the location of the project. These types of potential effects during/due to construction may conflict with a congestion management plan or an applicable transportation plan, ordinance, or policy—at least temporarily.

Depending on the location, construction of new or modified facilities may result in roads being temporarily blocked, rerouted, or altered, which could potentially impede and result in inadequate emergency access and delay the response time for emergency vehicles. Although many of these projects likely would occur in locations typically removed from major roadways and traffic sources, if a project requires lane closures during construction, emergency access could be affected. If construction projects required permanent relocation of a road segment, relocation could require changes in the horizontal or vertical alignment of the segment. The new segment, depending on the design, could increase or introduce a hazard to vehicles traveling on that segment. The severity of these impacts would depend on several factors, such as the location, size, and duration of project construction and the number of vehicles and vehicle trips needed.

Projects requiring in-channel construction activities could temporarily obstruct boat navigation and cause boat traffic delays, depending on the location. Construction equipment (e.g., barges and dredges) could temporarily obstruct boat traffic.

Transportation and traffic impacts associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-TRA-a,b,d–f: A (CMM-TRA-a,b,d–f). Mitigation can include preparing and implementing a traffic management plan (TMP) and restoration of roads, bicycle lanes, or pedestrian facilities damaged during construction. The TMP should be implemented in close coordination with an emergency response plan (CMM-HAZ-a–h: 6) to minimize or avoid causing inadequate emergency access during construction through coordination with emergency response agencies. In addition, as discussed in more detail below, Mitigation Measure 7.22 MM-TRA-a,b,d–f: B can avoid or reduce additional potentially significant impacts associated with new and modified facilities, as applicable. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new and modified facilities are not known, transportation and traffic impacts cannot be determined with certainty at this time. Therefore, potential construction impacts on transportation and traffic remain potentially significant.

New or modified facilities would not result in a change in air traffic patterns because no airport facilities are proposed and there would be no increase in demand for air travel or a change in air traffic patterns due to a change in location from implementing these types of projects. Section 7.22.2.8, *Hazards and Hazardous Materials*, evaluates the potential for new or modified facilities to result in a safety hazard for people residing or working in the project area if a project is located within an airport land use plan or within 2 miles of a public airport or public use airport, if no airport land use plan has been adopted.

Section 7.19, *Transportation/Traffic*, evaluates the operational effects on transportation and traffic due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Transportation impacts from new or modified reservoirs and points of diversion could have potential temporary impacts on traffic, circulation, and emergency access during construction (see *Common Construction*). For some reservoir projects, potential construction-related effects could occur over several years. In addition, construction of large points of diversion has the potential to

affect boat navigation on rivers because in-water work, potentially including the use of barges, would likely be required during construction. Depending on the location, new reservoir projects could result in permanent inundation of roads and thus construction of new replacement roads would be required.

Access to new reservoirs in rural areas may be on limited and narrow roads historically intended for low levels of traffic. Operation of new reservoirs with recreational facilities would potentially attract a substantial number of recreationists, which could cause periodic traffic congestion as well as unplanned wear and tear on rural roads. Both new and modified reservoirs could require dredging operations that would increase traffic related to trucking dredged material to another location, either for reuse or disposal. Given the amount of sediment that could be removed for reservoirs that require dredging for long-term operation, many truck trips could be required over a relatively short period.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-TRA- a,b,d–f: B could avoid or reduce additional impacts on transportation networks and traffic associated with new reservoirs and points of diversion projects. This mitigation includes preproject planning, which requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including traffic management during and after construction. New and relocated roads will be designed according to applicable road design standards and regulations. Additionally, project planning and feasibility studies for new reservoirs will consider and address potential transportation impacts that could affect established communities (Mitigation Measure 7.22 MM-LU-a–c: B1) and recreation facilities (Mitigation Measures 7.22 MM-REC-a,b: B1 and B2). Until mitigation measures are implemented, the impacts remain potentially significant.

Groundwater Wells and Groundwater Storage and Recovery Projects

Potential impacts on transportation due to new groundwater wells and groundwater storage and recovery projects are primarily associated with construction activities (see *Common Construction*). While maintenance of the groundwater wells for each of these facilities would involve worker travel to the sites, these trips would not be a substantial change or increase from trips required to maintain and farm the active agricultural lands or trips associated with ongoing municipal facility maintenance. Maintenance activities are not anticipated to involve substantial use of equipment, vehicles, employees, or activities that could affect emergency access. Existing equipment, vehicles, and employees would carry out similar types of operation and maintenance activities, and activities would be removed from most major roadways and traffic sources, thus avoiding interference with emergency access.

Water Treatment Facilities

Water treatment facility projects, including brackish water or seawater desalination, could have temporary construction-related impacts on transportation (including water navigation) and traffic conditions (including emergency access) (see *Common Construction*).

In addition to daily vehicle traffic generated by water treatment facility staff, operation of water treatment facilities would include regular truck traffic to transport bulk supplies of water treatment chemicals, equipment, and waste solids disposal. Staff commute trips would not be expected to affect the performance of the circulation system or conflict with an applicable congestion management program. Depending on the facility size, there would likely be fewer than 50 full-time

personnel in total. Because water treatment facilities operate 24 hours per day, 365 days per year, staff vehicle trips would likely be divided between 3 daily shifts. Solid waste disposal truck trips may be required on a daily basis, but the number of average daily trips would not be expected to be substantial enough to adversely affect transportation resources or traffic.

Other Construction Projects

Transportation impacts associated with other construction projects (boat ramps, stream gages and other monitoring devices, and other conservation project facilities) are primarily associated with construction activities (see *Common Construction*). Operation of these facilities would not generate additional vehicle trips beyond those periodically needed to monitor and maintain the facilities. If maintenance activities are needed, they would be temporary and infrequent. Maintenance activities would not substantially increase traffic, resulting in congestion on roads or at intersections, or affect pedestrian and bicycle paths or mass transit; these activities therefore would not likely conflict with an applicable transportation plan, ordinance, or policy. For similar reasons, operations would not be likely to conflict with an applicable congestion management program. Congestion management programs are developed by the regional transportation agency and are based on land use and population growth projections.

Once construction activities are completed, facilities would not result in inadequate emergency access because operation and maintenance of these projects would not substantially increase traffic or block roadways. Employee trips would be similar to existing conditions. No airport facilities are proposed, and demand for air travel would not increase from implementing these types of projects.

Mitigation Measures

7.22 MM-TRA-a,b,d–f: Mitigate transportation impacts

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction TRA Mitigation Measures (CMM-TRA-a,b,d–f)

1. **Regulatory Compliance:** Comply with all applicable federal, state, and local transportation regulatory requirements, including but not limited to, 23 U.S. Code section 109 and 23 C.F.R. 630, subpart J, *Federal Work Zone Safety and Mobility Regulations*.
2. **Avoid and Minimize Interference with Transportation Networks:** Avoid modifications to federal, state, and county highways; local roadways; and bridges that may reduce vehicle capacity. Avoid and minimize impacts on bicycle and pedestrian circulation by minimizing closures of paths and providing for temporary or permanent relocation of the facility. Consult with the appropriate public works department to determine the most feasible alignment for facility relocation.
3. **Traffic Management Plan:** Prior to construction, and in coordination with applicable transportation entities (Caltrans Permit Department, local jurisdictions, and the California Highway Patrol), prepare a TMP to provide safe and efficient traffic flow during construction. The TMP will identify the project's effects on the surrounding road network, including any necessary closures, diversion routes for traffic and pedestrians,

traffic management measures, waiting/loading restrictions, and emergency services access.

Coordinate the TMP, as applicable, with the project's emergency response plan (CMM-HAZ-a–h: 6), fire prevention and management plan (CMM-HAZ-a–h: 9), and spill prevention and response plan (CMM-HAZ-a–h: 1iii).

The TMP could include the following measures.

i. Identify elements (e.g., warning and detour signage) to address traffic control for any street closure, detour, or other disruption to traffic circulation.

ii. Identify routes that construction vehicles will use to access the site, construction detour routes, and vehicle weight and speed limits on local roads used to access the construction site.

iii. Locate informational signs along roads directly adjacent to or approaching construction work zones to direct construction traffic regarding ingress and egress points.

iv. Use signage, striping, fencing, barricades, and other physical structures to minimize pedestrian or bicyclist accidents or disruption of pedestrian or bicycle traffic and to prevent bicyclists and pedestrians from entering the construction area.

v. Provide notice to transit operators, emergency service providers, businesses, and residences of construction work of any anticipated delays, traffic control measures, temporary road closures, and emergency and evacuation routes.

vi. Identify appropriate emergency access routes and equipment that provide adequate response time.

4. **Restore Damaged Transportation Facilities:** Restore damaged roads and roadway shoulders, public transit facilities, bicycle lanes, or pedestrian facilities to preproject or better conditions during (as needed for public safety) and upon completion of construction.

5. **Waterway Traffic Control Plan:** Prepare and implement a waterway traffic control plan to ensure safe and efficient vessel navigation during construction in or over waterways. The plan will identify vessel traffic control measures to minimize congestion and navigation hazards. Include the following components as appropriate for the project.

   i. Barricade or guard construction areas in the waterway with readily visible barriers or other effective means to warn boaters and to restrict access.

   ii. Where temporary partial channel closure is necessary, identify and implement alternate detour routing and procedures for notifying boaters of construction and partial closures, including coordination with the U.S. Coast Guard, local boating organizations, and marinas.

   iii. Ensure safe boat access to public launch and docking facilities, businesses, and residences, to the extent feasible.

6. **Road and Bridge Design:** Road and bridge projects will be constructed consistent with the latest version of the Caltrans *Highway Design Manual* (7th Edition [^Caltrans 2022])

or equivalent and will not conflict with any applicable plan, ordinance, or policy related to performance of the transportation system, traffic safety, and/or congestion management of the area in which the project is implemented.

B. Reservoirs and Points of Diversion TRA Mitigation Measures

1. **Project Planning:** Preproject planning for reservoirs and points of diversion requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility. A project design must take into consideration traffic management during and after construction to minimize impacts on transportation in and around the project site.
2. **Road Design:** Any new or relocated roads, or existing access roads that remain once the new/modified reservoir or point of diversion is built, must be constructed in conformance with applicable road design standards and regulations to avoid hazards (e.g., sharp curves, dangerous intersections) or incompatible uses.
3. **Feasibility Study** (7.22 MM-LU-a–c: B1)
4. **Project Siting and Design** (7.22 MM-REC-a,b: B1)
5. **Project Planning** (7.22 MM-REC-a,b: B2)

7.22.2.17 Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. Utilities and Service Systems				
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	☒	☐	☐	☐
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	☐	☐	☒	☐
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	☒	☐	☐	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	☒	☐	☐	☐
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	☒	☐	☐	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs	☒	☐	☐	☐
g.	Comply with federal, state, and local statutes and regulations related to solid waste	☒	☐	☐	☐

Section 7.20.2, *Environmental Setting*, describes the utilities and service systems setting, and additional regulatory setting is described in Appendix E, *Regulatory Framework for Construction Projects*.

Common Construction

The need for additional utilities and service systems typically results from new development and an increase in population. As population increases, the need for additional services, such as water treatment, wastewater treatment, and landfills, increases. As stated in Section 7.22.2.13, *Population and Housing*, this analysis of new and modified facilities assumes that these projects may be developed in response to reduced Sacramento/Delta surface water supply and does not consider projects that would increase water supply to support additional growth and population increases. Installation of new and modified facilities would not result in long-term population and housing growth or substantial employment growth. Accordingly, new and modified facilities would not result in associated impacts on utilities and service systems as a result of increased population and development.

Construction sites can generate storm water runoff that discharges waste containing sediment and other pollutants. Wastewater from construction can also include wastewater from sanitation facilities used by construction crews or wastewater generated directly from construction-related activities, such as concrete washout, slurry fluids from boring and drilling (e.g., for tunnels and foundations), and groundwater from dewatering activities. If not adequately controlled, construction discharges of waste could exceed wastewater treatment requirements of the applicable regional water board. Stormwater and wastewater from construction activities are subject to permitting requirements under the Clean Water Act (see Section E.1.9.1 in Appendix E, *Regulatory Framework for Construction Projects*). The potential for construction activities to violate water quality standards or WDRs, and potential mitigation for those impacts are discussed in Section 7.22.2.9, *Hydrology and Water Quality*. Adequate toilet facilities are typically placed at construction sites for the duration of construction that are regularly cleaned and maintained for construction crews; typically, both county and state regulations dictate requirements for the appropriate number of these facilities and sanitary conditions.

The need for stormwater drainage facilities is generally related to impervious surfaces, as described in Section 7.22.2.9. Once constructed, some new or modified facilities could add relatively large areas of impervious or semi-impervious surfaces. For example, paved or concrete areas (e.g., roads and parking lots) and large buildings and other structures would likely be necessary for new water treatment facilities, desalination facilities, new points of diversion, and new reservoirs. To accommodate stormwater runoff from these areas, construction of new or expanded stormwater drainage facilities likely would be required.

Construction activities require water supply for construction workers on site, manufacture and curing of concrete and mortar, testing for waterproofing, cleaning, dust control, and other activities. These uses are generally not of the magnitude or duration that would require new or expanded entitlements for water supply. Dust suppression needs and other disturbance-related water demand would vary depending on the weather and soils conditions. Construction-related water demand is temporary and short-term, and the water needed for construction and construction workers could be provided by existing municipal and non-municipal systems (e.g., water wells, water trucks). In addition, where available, use of recycled water would reduce the use of potable water for these purposes during construction.

Construction of new or modified facilities could temporarily increase the volume of solid waste (e.g., soil, drilling mud, vegetative material, construction debris) disposed of at landfills. The amount of solid waste generated would depend on the size and nature of the project and the ability to recycle, reuse, or dispose of materials on site. The materials generated would be hauled off site to landfills (e.g., building demolition waste), delivered to recycling facilities (e.g., concrete), sold (e.g., organic material to cogeneration facilities), or reused onsite or nearby (e.g., other projects needing fill material).

Construction projects could also temporarily disrupt existing electric and natural gas utilities and telecommunication lines. Construction may require temporary shutdown of utilities or could disrupt utilities inadvertently by damaging underground utilities during trenching, augering, or other excavation. Construction activities could also damage utility poles or snag suspended utility lines.

Impacts on utilities and service systems associated with common construction activities would be potentially significant and can be avoided or reduced by implementation of Mitigation Measure 7.22 MM-UT-a,c–g: A (CMM-UT-a,c,f,g). Mitigation can include wastewater control measures, and any water required for construction would be acquired pursuant to a valid water right or contract with a water provider. For solid waste, mitigation includes compliance with federal, state, and local statues and regulations related to solid waste and solid waste disposal, and preparation and implementation of a construction recycling plan for reuse of construction waste. Project proponents will coordinate with area utility or service providers to identify existing underground utilities and telecommunication lines at excavation sites prior to construction and will avoid or relocate them. In addition, as discussed in more detail below, implementation of Mitigation Measure 7.22 MM-UT-a,c–g: B can avoid or reduce additional potentially significant impacts on utilities and service systems associated with new or modified facilities. If mitigation measures are implemented, many impacts (including construction impacts) can be mitigated to less than significant. Because the precise location and magnitude of activities required for new or modified facilities are not known, impacts on utilities and service systems cannot be determined with certainty at this time. Therefore, potential impacts on utilities and service systems remain potentially significant.

The relatively small volume of wastewater generated during construction would not likely require construction of new or expanded wastewater treatment facilities, result in a determination by the wastewater treatment provider that it has inadequate capacity or affect the ability of a wastewater treatment facility to meet wastewater treatment requirements of a regional water board. Construction activity would not necessitate a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

For new or modified facilities that may be located in relatively remote or rural areas where sewage connections to a wastewater treatment facility may not be available, wastewater would be addressed via septic systems and/or closed vault toilet systems. On-site septic systems would preclude the need to construct new wastewater treatment facilities or expand existing wastewater treatment facilities. Vault toilets would require emptying periodically, and the wastewater could be transported to an appropriate treatment facility or facilities with capacity to treat the wastewater.

Some new or modified facilities would supplement or conserve surface water supplies. They would stabilize or add to, rather than draw from, existing resources. Thus, these facilities would not create or increase any shortfall between available supplies and demand; sufficient water supplies would be available to serve these projects.

As explained in more detail below, several new or modified facilities would require a viable water source. For example, a reservoir would require a valid water right, and water must be available to implement the project. A groundwater storage and recovery project would require a water source such as stormwater runoff or recycled water. These sources are prerequisites for new or modified facilities and do not represent new supplies. Effects associated with various water sources are addressed in Section 7.22.2.9, *Hydrology and Water Quality*. The potential for new or modified facilities to result in population growth is evaluated in Section 7.23, *Cumulative Impact Analysis, Growth-Inducing Effects, and Significant and Irreversible Changes*.

Section 7.20, *Utilities and Service Systems*, evaluates the operational effects on utilities and service systems due to increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water recycling, water transfers, and agricultural and municipal conservation measures, and presents any applicable mitigation measures to minimize or avoid these effects.

Reservoirs and Points of Diversion

Reservoir and points of diversion projects could result in impacts on utilities and service systems related to construction, including the addition of impervious areas that would require new stormwater drainage facilities (see *Common Construction*). In addition, expansion of existing reservoirs through dredging may result in dredged material that cannot be reused for beneficial purposes and thus would require disposal at an appropriate landfill facility.

Operation of new or modified reservoirs would not be expected to exceed wastewater treatment requirements of the regional water board because reservoirs are not treating wastewater. While a tailrace of a dam is considered a discharge under state law, reservoirs are rarely, if ever, regulated under WDRs. See Section 7.22.2.9, *Hydrology and Water Quality*, for a discussion of potential water quality effects within and downstream of a reservoir. The additional storage in a modified reservoir could also provide flexibility to meet water quality objectives if there was additional control of inflowing water.

Reservoirs and points of diversion would require State Water Board approval of either a new water right or a change of an existing right. This source water would likely come from existing entitlements that the new or modified facility's operator would acquire.

These impacts would be potentially significant. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-UT-a,c–g: B could reduce impacts on utilities and service systems associated with reservoir and points of diversion projects. A water right

application to appropriate water by permit with the State Water Board is required. Consideration of such an application is a discretionary action that requires a determination that unappropriated water is available, a review of potential impacts on public trust resources, and a determination that the appropriation of water is in the public interest. New or modified reservoir and diversion projects must be developed and implemented in consultation with, and subject to approval from, multiple state and federal agencies. These include the State Water Board, regional water board, and DSOD (see also 7.22 MM-GEO-a–e: B1) for jurisdictional dams; fisheries agencies, including CDFW, NMFS, USFWS, and USACE; and the Central Valley Flood Protection Board. Site-specific drainage studies prior to final project design would inform the design of the stormwater drainage facilities for new reservoirs and points of diversions (as required) such that potential environmental impacts of these facilities would be avoided. In addition, implementation of BMPs to reduce the volume of solid waste diverted to landfill would help ensure that the solid waste disposal needs of a new or modified reservoir can be accommodated at local landfills and disposal facilities. Until mitigation measures are implemented, the impacts remain potentially significant.

At new reservoirs, solid waste would be generated at administration, operations, and maintenance facilities and, to a greater degree, at recreation areas, if present. Use of recreation areas would likely generate more solid waste (i.e., trash) than other on-site facilities and the volume could be substantial. However, because generation of trash at on-site recreational facilities would be seasonal, it is unlikely that the volume generated would exceed the capacity of a local landfill. New or changed points of diversion would not generate wastewater, but screened diversions generally require removal of debris from the surfaces of the structure. The volume of solid waste requiring disposal from the periodic cleaning of a new screened diversion could be accommodated by a local landfill.

New or modified reservoirs and points of diversion can help facilitate water transfers. The environmental effects of increased use of water transfers using existing infrastructure are evaluated in the resource-specific analyses in Section 7.3 through Section 7.20 (under *Other Water Management Actions*).

Groundwater Wells and Groundwater Storage and Recovery

Construction of groundwater wells, including wells for groundwater storage and recovery, may temporarily affect utilities and service systems primarily through generation of solid waste and wastewater resulting from drilling. Potential construction-related impacts on utilities and service systems could be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

A new groundwater well would require a valid groundwater right, either overlying or appropriative, and depending on the location, would need to be consistent with any relevant groundwater sustainability plan. Groundwater storage of surface water would capture a new supply that is generally not subject to existing entitlements. This would require new entitlement in the form of a water right permit from the State Water Board but would not lead to a shortfall between supply and demand. Retrieval of stored groundwater from groundwater storage and recovery projects or operation of new groundwater wells that are not included in these projects would not induce unplanned population growth that would require or result in construction of new water treatment facilities or the expansion of existing facilities.

The operational effects on utilities and service systems due to increased use of groundwater and groundwater storage and recovery using existing infrastructure, as well as applicable mitigation

measures to minimize or avoid these effects, are evaluated in Section 7.20, *Utilities and Service Systems* (Impacts UT-a and UT-b).

Water Treatment Facilities

Water treatment facilities could result in impacts on utilities and service systems related to construction, including the addition of impervious areas that would require new stormwater drainage facilities. Most of these impacts could be mitigated through implementation of common construction mitigation measures (see *Common Construction*).

New or modified WWTPs would be required to comply with all permits issued by the regional water board to regulate waste discharges (see Section 7.22.2.9, *Hydrology and Water Quality*). Therefore, to continue to operate, these facilities would not exceed wastewater treatment requirements of the applicable regional water board.

Drinking water treatment plants would require a valid water right if drawing surface water or groundwater as a source; and groundwater withdrawal may require consistency with a groundwater sustainability plan, depending on the location. Wastewater treatment relies on an existing source for treatment and recycling. A water right is not required for ocean desalination.

New water treatment facilities, including desalination facilities, would likely include employee restrooms, sinks, and emergency eye wash/shower stations—facilities that would require a water supply and generate wastewater. Given the relatively small number of employees typically required to run water treatment facilities, the water used in these internal facilities would not be of a volume that would necessitate a new or expanded water supply, and the wastewater generated from the usage of restrooms and sinks would not be substantial such that it would exceed the capacity of the existing wastewater treatment provider. For facilities that use reverse osmosis membranes as part of the water treatment process (i.e., water recycling and desalination facilities), wastewater would be generated in cleaning the membranes. Brine generated in the desalination process is typically discharged as wastewater back into the ocean if the facility is located near the coast and thus would not require additional treatment at a WWTP.

As discussed in Section 7.22.2.8, *Hazards and Hazardous Materials*, drinking water treatment plants and WWTPs generate solid waste in the form of water treatment sludge, and sewage sludge and biosolids, respectively, that would require disposal. While recycled water facilities also may generate solid waste, it is anticipated that solids generated at this step of treatment would be minimal given that these solids are largely removed during the initial primary and secondary stages of the wastewater treatment process. Generally, this type of solid waste, which is generated following the tertiary wastewater treatment stage, is not considered hazardous and can be recycled after it is treated and tested. Like water treatment facilities and recycled water facilities, operation of desalination facilities would generate residual solid waste, which would consist of sludge and potentially filter cartridges. The solid waste would contain salts and other naturally occurring constituents in seawater (e.g., algae, sediment, microorganisms) and chemicals used in the water treatment process (Aquasure n.d.). It is likely that solid waste from the desalination process could not be used for other purposes (e.g., soil remediation) given the high salt content. The disposal of solid waste from water treatment facilities would comply with federal, state, and local regulations. It is unlikely that the increase in solid waste from these water treatment facilities would be substantial enough to require additional landfill capacity, in part because biosolids meeting stringent pollutant concentration limits for land application would be put to beneficial use.

Section 7.20, *Utilities and Service Systems*, evaluates the potential operational impacts on utilities and service systems related to increased use of groundwater pumping (as might occur if groundwater was used as a water source for new drinking water treatment plants) and increased use of recycled water and presents any applicable mitigation measures to minimize or avoid these effects.

Other Construction Projects

Boat ramps, stream gages and other monitoring devices, and canal lining construction activities could result in temporary impacts related to the generation of solid waste, construction-related wastewater, and stormwater runoff (see *Common Construction*). Once constructed, boat ramps, stream gages and other monitoring devices, and canal lining or encasement projects would not affect utilities or service systems because these facilities would not generate solid waste or wastewater or require a new water supply.

Mitigation Measures

7.22 MM-UT-a,c–g: Mitigate impacts on utilities and service systems

Entities or agencies designing and/or approving new or modified facilities will implement or require the following.

A. Construction UT Mitigation Measures (CMM-UT-a,c,f,g)

1. **Wastewater Control Measures:**
    i. Obtain and comply with all necessary permits and regulations related to discharging wastewater, including but not limited to, regional water board waste discharge requirements and State Water Board Order No. 2022-0057-DWQ (Construction General Permit), which requires the applicant to address such items as employee wastewater generated during construction and spill containment and clean-up.
    ii. Implement water quality regulatory compliance measures (CMM-WQ-a–j: 1)
    iii. Place portable chemical toilets for the duration of construction. Wastewater will be pumped from these portable toilets and then hauled to and disposed of at permitted facilities in accordance with both county and state regulations.
2. **Water Supply:** Water used for construction must be pursuant to a valid water right or contract with a water provider. If a source of recycled water is available, use recycled water for non-potable construction demand.
3. **Non-Hazardous Solid Waste Disposal:**
    i. Regulatory Compliance: Comply with the California Integrated Waste Management Act (AB) 939 [Sher], Statutes of 1989, as amended; Pub. Resources Code, § 41780) for the disposal of nonhazardous solid waste.
    ii. Construction Waste Recycling Plan: Prepare and implement a construction waste recycling plan for reuse/recycling of construction waste. The plan will identify the type of recyclable construction and demolition debris to be recycled (e.g., concrete, steel/metals, cardboard), the method of on-site handling of this debris, and the diversion facility that will receive this recyclable debris. The plan will emphasize source reduction measures, followed by recycling and composting methods, to

ensure that construction and demolition waste generated by the project is managed consistent with applicable statutes and regulations. In accordance with the California Green Building Standards Code and local regulations, the plan will specify that all trees, stumps, rocks, and associated vegetation and soils and 50 percent of all other nonhazardous construction and demolition waste be diverted from landfill disposal. The plan will be prepared in coordination with the applicable local waste management district.

4. **Utility Services:** Mitigate impacts of construction that could result in the interruption of utility services.

    i. Coordinate Planned Power Outages: Coordinate any planned power outages, as necessary, and notify potentially affected utility users of temporary loss of electricity.

    ii. Identify Existing Underground Utilities and Telecommunication Lines prior to Excavation: Coordinate with the area utility or service provider to identify existing underground utilities and telecommunication lines at excavation sites prior to construction and avoid or relocate them. Relocate utilities prior to project construction to ensure continued access and utility service through the project area and vicinity. Restore any interrupted/disconnected utility services promptly.

5. **Site-Specific Drainage Study:** Prior to project design, perform a site-specific drainage study to evaluate existing drainage conditions and inform project design such that potential environmental impacts from new or expanded stormwater drainage facilities are avoided.

B. Reservoir and Points of Diversion UT Mitigation Measure

1. **Reservoirs and Points of Diversion WQ Mitigation Measures** (7.22 MM-WQ-a–j: B)

C. Groundwater Wells and Groundwater Storage and Recovery UT Mitigation Measure

1. **Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures** (7.22 MM-WQ-a–j: C)

D. Water Treatment Facilities UT Mitigation Measure

1. **Water Treatment Facilities WQ Mitigation Measures** (7.22 MM-WQ-a–j: D)

7.22.3 Summary of Impacts

Table 7.22-1 provides a summary of potentially significant, less-than-significant, and beneficial impacts from implementation of new or modified facilities. Mitigation measures to avoid, minimize, or offset potentially significant environmental impacts are also identified in Table 7.22-1. Where no environmental impact would result from implementation of these projects, this is also identified in the table.

Table 7.22-1. Impact and Mitigation Measure Summary—New or Modified Facilities

Impact	Impact Conclusions	Proposed Mitigation
AESTHETICS		
Impact AES-a: Have a substantial adverse effect on a scenic vista **Impact AES-b:** Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway **Impact AES-c:** Substantially degrade the existing visual character or quality of the site and its surroundings **Impact AES-d:** Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	**Potentially Significant** ***Common Construction*** Construction may physically damage scenic resources, introduce large construction equipment, remove vegetation, stockpile materials, create dust, or add new sources of lighting and glare Permanent installation of artificial elements (e.g., riprap), solar panels, and/or security and safety lighting	**7.22 MM-AES-a–d: Mitigate impacts on visual resources** **A. Construction AES Mitigation Measures (CMM-AES-a–d):** 1. Project Siting and Design 2. Screen Construction Areas 3. Spoil Disposal Areas 4. Dust Control Measures (CMM-AQ-a–e: 3) 5. Waste Management and Material Control Measures (CMM-WQ-a–j: 4) 6. Light and Glare Minimization 7. Construction BIO Mitigation Measures: Avoid Vegetation Disturbance (CMM-BIO-a–f: 9), Revegetation Plan (CMM-BIO-a–f: 11) and Revegetation Monitoring and Reporting (CMM-BIO-a–f: 12)
	Reservoirs and Points of Diversion On-stream reservoirs could flood land and convert natural river canyon scenery to lacustrine scenery affecting a scenic vista, damaging scenic resources, or degrading the visual character or quality of the site Flooding farmland or other land cover types could affect a scenic vista, damage scenic resources, or degrade the visual character or quality of the site Introducing new permanent facilities (e.g., pump houses, spillways, power generation facilities), installation of artificial elements (e.g., riprap),	**B. Reservoirs and Points of Diversion AES Mitigation Measures** 1. Project Planning 2. Project Siting 3. Project Design

Impact	Impact Conclusions	Proposed Mitigation
	buildings and other structures (e.g., transmission lines), and roads could affect scenic and visual quality	
	Groundwater Wells and Groundwater Storage and Recovery Well siting could change the visual quality or character of an urban or suburban area and introduce new sources of light or glare	**A. Construction AES Mitigation Measures (CMM-AES-a–d)** **C. Water Treatment Facilities AES Mitigation Measures** 1. Project Siting (7.22 MM-AES-a–d: C2) 2. Project Design (7.22 MM-AES-a–d: C3)
	Water Treatment Facilities Introducing new or expanded built facilities (e.g., large buildings, water conveyance infrastructure) to an area could affect the existing visual character and quality	**C. Water Treatment Facilities AES Mitigation Measures** 1. Project Planning 2. Project Siting 3. Project Design
	Other Construction Projects Canal lining or encasement projects could result in permanent landscape-level changes to the visual environment	**A. Construction AES Mitigation Measures (CMM-AES-a–d)**
	Less than Significant	
	Water Treatment Facilities Modified water treatment facilities, including water recycling treatment plants, would be less likely to have long-term impacts on the visual character or quality of an area because these facilities would be located adjacent to existing infrastructure and/or within or adjacent to existing facilities	—
AGRICULTURE AND FOREST RESOURCES		
Impact AG-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the	**Potentially Significant** ***Common Construction*** Construction activities could remove vegetation	**7.22 MM-AG-a–e: Mitigate impacts related to agriculture and forest resources**

Impact	Impact Conclusions	Proposed Mitigation
maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use **Impact AG-b:** Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract **Impact AG-c:** Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	and/or topsoil; introduce invasive weeds; restrict access to or interfere with use of agricultural land; disturb utilities and infrastructure serving agriculture; and disturb soil in development footprints, borrow/spoils areas, or staging areas (e.g., soil compaction resulting from heavy equipment storage or soil stockpiling) Agricultural or forested areas cleared for buildings and other facilities (e.g., power supply facilities), roads, and other project features could result in direct permanent conversion of important farmland, conflict with agricultural zoning or Williamson Act-contracted land, result in loss or conversion of forest land, or conflict with existing zoning for forest land or timberland	**A. Construction AG Mitigation Measures (CMM-AG-a–e)** 1. Project Siting and Design 2. Invasive Species Control Measures 3. Post-Construction Best Management Practices 4. Protect Agricultural Soils 5. Agricultural Mitigation Consistent with County and Local Jurisdiction Requirements 6. Avoid or Minimize Impacts on Forest and Timberland
Impact AG-d: Result in the loss of forest land or conversion of forest land to non-forest use **Impact AG-e:** Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use	***Reservoirs and Points of Diversion*** Filling a new reservoir or expanding an existing reservoir footprint could permanently convert important farmland or forest land, conflict with agricultural zoning or Williamson Act-contracted land, or conflict with existing zoning for forest land or timberland land if the reservoir was sited in whole or part on these land types	**A. Construction AG Mitigation Measures (CMM-AG-a–e)**
	Beneficial	
	New or Modified Facilities Reservoirs and points of diversion, groundwater wells, groundwater storage and recovery projects, and water treatment facilities could support the continued use of agricultural land by supplying irrigation water, and to make water delivery more accessible and efficient	—
AIR QUALITY		
Impact AQ-a: Conflict with or obstruct implementation of the applicable air quality	**Potentially Significant** ***Common Construction***	**7.22 MM-AQ-a–e: Mitigate impacts on air**

Impact	Impact Conclusions	Proposed Mitigation
plan **Impact AQ-b:** Violate any air quality standard or contribute substantially to an existing or projected air quality violation **Impact AQ-c:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) **Impact AQ-d**: Expose sensitive receptors to substantial pollutant concentrations **Impact AQ-e:** Create objectionable odors affecting a substantial number of people	Construction activities could generate fugitive dust and emissions from fuel combustion of heavy construction equipment and vehicles Inadvertent dispersal of *Coccidioides* spores (responsible for Valley Fever) and asbestos into the environment	**quality** **A. Construction AQ Mitigation Measures (CMM-AQ- a–e)** 1. Regulatory Compliance 2. Emissions Reductions Measures 3. Dust Control Measures 4. Valley Fever Control Measures 5. Asbestos Control Measures 6. Health Risk Assessment 7. Minimize Construction-Related Traffic and Equipment Use 8. Blasting Operations and Safety Plan (CMM-GEO-a–e: 7) for fugitive dust control
	Reservoirs and Points of Diversion Substantial particulate emissions from use of heavy construction equipment and vehicles, blasting activities, and from removal of soil spoils Operation of recreational facilities associated with the new reservoir could result in generation of emissions from vehicle trips and motorized recreational vehicles (e.g., boats and jet skis)	**B. Reservoirs and Points of Diversion AQ Mitigation Measures** 1. Site-Specific Dust Control Plan 2. Recreational Boat Emissions Minimization Plan 3. Offset Criteria Pollutant Emissions Generated from Recreational Boating
	Water Treatment Facilities Operation of new wastewater treatment plants could result in new source of odors	**C. Water Treatment Facilities AQ Mitigation Measures** 1. Regulatory Compliance (7.22 MM-WQ-a–j: D1) 2. Odor Management Plan
	Less than Significant	
	Reservoirs and Points of Diversion Odors produced by harmful algal blooms (HABs) in new reservoirs	—

Impact	Impact Conclusions	Proposed Mitigation
	Water Treatment Facilities Operation of desalination facilities would likely be powered by energy efficient and low-cost power sources and not generate significant power-generation emissions	—
BIOLOGICAL RESOURCES		
Impact BIO-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact BIO-b:** Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact BIO-c:** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrolgical interruption, or other means **Impact BIO-d:** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites **Impact BIO-e:** Conflict with any local	**Potentially Significant** ***Common Construction*** Construction projects could be located in a sensitive natural community, habitat for special-status species, wetlands, wildlife corridors, or waterways Direct or indirect harm (including mortality) to special-status species and associated habitat from movement of heavy machinery where such species occur Disturbance of special-status species through construction noise, physical vibration, and direct removal of structures that provide habitat Introduction or spread of invasive vegetative species through the movement of topsoil, fill, gravel, and construction equipment Removal of riparian vegetation and disturbance to wetlands to facilitate heavy equipment movement and other construction activities Release of sediment and possibly hazardous materials (e.g., oil or gas from construction equipment) into waterbodies from construction on or near waterways Creation of noise and vibration that could harm fish from activities such as pile driving, blasting, or use of other construction equipment Release of concrete particles from blasting to surface waters could disturb terrestrial wildlife	**7.22 MM-BIO a–f: Mitigate impacts on biological resources** **A. Construction BIO Mitigation Measures (CMM-BIO-a–f)** 1. Regulatory Compliance 2. Preconstruction Surveys 3. Avoid, Minimize, or Compensate for Impacts on Sensitive Natural Communities 4. Avoid, Minimize, or Compensate for Impacts on Special-Status Species 5. Environmental Awareness Training 6. Incorporate Protection Measures for In-Water Construction 7. Avoid or Minimize Impeding Access to Established Native Resident or Migratory Wildlife Corridors or Native Wildlife Nurseries for Fish or Wildlife Species during Construction 8. Invasive Species Control Measures 9. Avoid Vegetation Disturbance 10. Staging Areas 11. Revegetation Plan 12. Revegetation Monitoring and Reporting 13. Compliance with HCPs and NCCPs 14. Construction WQ Mitigation Measures

Impact	Impact Conclusions	Proposed Mitigation
policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance **Impact BIO-f:** Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	and harm fish Take of special-status fish species could result from construction and installation of cofferdams (resulting in fish stranding) or fish rescue in a dewatered area (seining, electrofishing) Some construction projects may conflict with adopted Habitat Conservation Plans (HCP) or Natural Community Conservation Plans (NCCP)	(CMM-WQ-a–j) 15. Avoid or Minimize Lighting and Glare Effects 16. Dust Control Measures (CMM-AQ-a–e: 3) 17. Construction NOI Mitigation Measures: Noise Reduction Measures (CMM-NOI-a,b,d-f: 2) and Vibration-Reduction Measures (CMM-NOI-a,b,d-f: 3) 18. Blasting Operations and Safety Plan (CMM-GEO-a–e: 7)
	Reservoirs and Points of Diversion Operation of reservoirs and points of diversion could affect biological resources depending on the source of the water and how much flow is diverted from the stream system Reservoir footprint inundation of a large new reservoir could result in permanent loss of thousands of acres of wildlife habitat, including sensitive natural communities New on-stream reservoirs would replace existing riverine habitats with aquatic lake habitat through flooding Loss of riparian trees and related habitat could affect multiple candidate, sensitive, and special-status species Reservoir and points of diversion projects could negatively affect biological resources by altering the timing and magnitude of flows and downstream water temperature Reservoir and points of diversion projects could eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter hydrodynamics, and alter scour and deposition	**B. Reservoirs and Points of Diversion BIO Mitigation Measures** 1. Regulatory Compliance 2. Project Planning and Design 3. Reservoirs and Points of Diversion WQ Mitigation Measures (7.22 MM-WQ-a-j: B) 4. Avoid or Minimize Impeding Access to Established Native Resident or Migratory Wildlife Corridors or Native Wildlife Nurseries for Fish or Wildlife Species 5. Dredging Plan 6. Minimize Intake Impacts on Fish 7. Compensate for Impacts on Special-Status Species and Habitat 8. Recreation Management Plan 9. Environmental Awareness Training 10. Reduce Bird Collisions with Overhead Power Lines 11. Maintenance Activities: Construction BIO Mitigation Measures (CMM-BIO-a–f) and Herbicide and Pesticide Use (CMM-HAZ-a–h: 4)

Impact	Impact Conclusions	Proposed Mitigation
	Flow changes to the Delta could alter temperature and salinity gradients in the Delta Dredging could result in direct physical injury to aquatic species, including special-status species if present, and could temporarily disrupt the movement of local and migratory fish species through increased turbidity Candidate, sensitive, and special-status species; their habitat; and sensitive natural communities could be affected in areas where dredged material is deposited Projects could interfere with movement of native resident or migratory fish Impingement and entrainment could occur at surface water diversions Invasive aquatic species could be established and spread; and habitat for species that prey on, compete with, or displace special-status species could be inadvertently created Recreation activities associated with reservoirs could disrupt wildlife movement patterns Power transmission lines could adversely affect migratory and non-migratory birds Temporary in-water activities that may be required for facility repairs or maintenance, although limited in duration, could result in injury or mortality of special-status fish and wildlife species and habitat disturbance	
	Water Treatment Facilities Operation of surface water treatment facilities could affect biological resources depending on the source of the water and how much is used Operation of intakes for surface water treatment facilities may result in impingement or entrainment of special-status fish and aquatic	**C. Water Treatment Facilities BIO Mitigation Measures** 1. Reservoirs and Points of Diversion BIO Mitigation Measures (7.22 MM-BIO-a-f: B) 2. Water Treatment Facilities WQ Mitigation Measures (7.22 MM-WQ-a–j: D)

Impact	Impact Conclusions	Proposed Mitigation
	species and may create conditions conducive to predation Desalination plant discharge-related effects on aquatic species could occur from exposure to toxic concentrations of brine Brine waste discharge may result in marine life mortality as a result of creating hypoxic or anoxic conditions or shearing stress from turbulent mixing Seawater desalination would remove benthic ecosystems on the ocean floor during excavation Power transmission lines could adversely affect migratory and non-migratory birds	3. Desalination Facilities BIO Mitigation Measures 4. Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures (7.22 MM-WQ-a-j: C) 5. Reduce Bird Collisions with Overhead Power Lines (7.22 MM-BIO-a–f: B10) 6. Maintenance Activities: Construction BIO Mitigation Measures (CMM-BIO-a–f) and Herbicide and Pesticide Use (CMM-HAZ-a–h: 4)
	Other Construction Projects Create drowning risk to wildlife by lining a canal, which would result in a steeper sideslope and faster flow velocity Conversion of a canal to an aboveground pipeline could interfere with an existing terrestrial migratory corridor Canal lining and encasement could substantially reduce or eliminate water seepage from unlined canals that support riparian and other adjacent sensitive natural communities or wetland vegetation	**D. Other Construction Project BIO Mitigation Measures** 1. Wildlife Escape Measures 2. Wildlife Passage at Aboveground Pipelines 3. Avoid, Minimize, or Compensate for Impacts on Sensitive Natural Communities (CMM-BIO-a–f: 3)
	Less than Significant	
	Reservoirs and Points of Diversion New reservoirs could create mosquito habitat and thus require the use of pesticides	—
	Water Treatment Facilities Use of recycled water could increase incidental irrigation runoff, soil salinity, and saturate soils that may affect adjacent natural habitat and	—

Impact	Impact Conclusions	Proposed Mitigation
	potentially sensitive species and plants	
	Other Construction Projects Modifying an open irrigation canal to an underground pipeline could result in loss of a drinking water source to wildlife	—
	Beneficial	
	Other Construction Projects Modifying an open irrigation canal to an underground pipeline could remove barriers to wildlife	—
CULTURAL RESOURCES		
Impact CUL-a: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 **Impact CUL-b:** Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5 **Impact CUL-c:** Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature **Impact CUL-d:** Disturb any human remains, including those interred outside of dedicated cemeteries	**Potentially Significant** ***Common Construction*** Ground-disturbing activities, including deep excavation, could damage archaeological sites or historic built environment resources or degrade unknown buried or near-surface cultural resources Changes in topography, hydrologic patterns, and soil movement could degrade or otherwise affect near-surface archaeological or built environment resources Construction activities could alter the appearance of a historic resource from dust interacting with an object's surface, which could cause damage or chemical alteration Temporary or permanent visual obstructions from the presence of large-scale equipment, machinery, and vehicles could diminish the integrity of cultural resources Unauthorized removal or vandalism of cultural resources could occur if construction enables access to cultural sites that were not previously	**7.22 MM-CUL-a–d: Mitigate impacts on cultural resources** **A. Construction CUL Mitigation Measures (CMM-CUL-a–d)** 1. Regulatory Compliance 2. Preconstruction Surveys for Historical, Archaeological, and Paleontological Resources; Cultural Landscapes; and Traditional Cultural Properties 3. Cultural Resources Management Plan 4. Unanticipated Discovery Measures 5. Oversight and Monitoring of Construction Activities 6. Worker Cultural Resources Sensitivity Training 7. Dust Control Measures (CMM-AQ-a–e: 3) 8. Construction NOI Mitigation Measurures: Noise-Reduction Measures (CMM-NOI- a,b,d-f: 2) and Vibration-Reduction Measures

Impact	Impact Conclusions	Proposed Mitigation
	known or accessible Access to cultural resources during construction could be reduced and thereby prevent or impair visits to cultural resources by people with a religious or cultural connection to the resource Vegetation clearing, generation of dust, and visual obstructions from the presence of large-scale equipment, machinery, and vehicles could result in impacts on cultural resources that have an associated landscape or other visual component that contributes to their significance, such as a sacred landscape or historic trail Pile driving could cause vibration that could physically damage or alter nearby historic built environment resources or linear features	(CMM-NOI- a,b,d-f: 3) 9. Construction Site Security (CMM-HAZ-a–h: 7) 10. Construction AES Mitigation Measures: Project Siting and Design (CMM-AES-a–d: 1) and Screen Construction Areas (CMM-AES-a–d: 2)
	Reservoirs and Points of Diversion New and expanded reservoir projects could permanently flood areas with buried or surficial historical, archaeological, or paleontological resources; unique geologic features; or human remains Changing water levels could expose previously inundated cultural resources or buried human remains to increased wave action, erosion, and human activity (e.g., looting) A dam raise project could cause a substantial adverse change to a historical resource if the existing dam were recognized as such If archaeological and/or paleontological resources exist in native soils below accumulated sediment in an existing reservoir, dredging (as part of reservoir expansion) could directly adversely affect these cultural resources	**B. Reservoirs and Points of Diversion CUL Mitigation Measures** 1. Historic Dams and Structures 2. Project Planning 3. Coordination with General or Resource Management Plan 4. Monitoring of Dredging

Impact	Impact Conclusions	Proposed Mitigation
ENERGY and GREENHOUSE GAS EMISSIONS		
Impact EN-b: Result in inefficient, wasteful, and unnecessary energy consumption **Impact GHG-a:** Generate greenhouse gas emissions, either directly or indirectly **Impact GHG-b:** Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	**Potentially Significant** ***Common Construction*** Temporary increase in energy demand from heavy construction equipment (e.g., trucks or barges, earthmoving equipment, and power tools) for actions such as excavating, grading, transporting materials, and transporting construction workers to and from the work sites Generation of GHG emissions from heavy construction equipment, haul trucks, and worker vehicles Construction activities could remove vegetation that acts to sequester GHGs (e.g., trees) GHG emissions from construction could conflict with an applicable GHG plan, policy, or regulation ***Reservoirs and Points of Diversion*** Energy use and associated GHG emissions for water diversion and conveyance Vegetation decay, which produces carbon dioxide and methane gases, could occur if vegetation is present in newly inundated areas ***Water Treatment Facilities*** Energy use and associated generation of GHGs for water treatment GHG emissions from facility operation could conflict with an applicable GHG plan, policy, or regulation	**7.22 MM-EN-b/GHG-a,b: Mitigate energy and GHG emissions impacts** **A. Construction EN/GHG Mitigation Measures (CMM-EN-b/GHG-a,b)** 1. Regulatory Compliance 2. GHG Emission Reduction Measures 3. Construction AQ Mitigation Measures: Regulatory Compliance (CMM-AQ-a–e: 1), Emission Reduction Measures (CMM-AQ-a–e: 2), and Minimize Construction-Related Traffic and Equipment Use (CMM-AQ-a–e: 7) **B. Regulatory Compliance** **C. Reservoirs and Points of Diversion EN/GHG Mitigation Measures** 1. Regulatory Compliance (7.22 MM-EN-b/GHG-a,b: B) 2. Project Design 3. GHG Reduction Plan 4. Vegetation Removal (7.22 MM-WQ-a–j: B8ii) **D. Water Treatment Facilities EN/GHG Mitigation Measures** 1. Regulatory Compliance (7.22 MM-EN-b/GHG-a,b: B) 2. GHG Reduction Plan (7.22 MM-EN-b/GHG-a,b: C3) 3. Project Siting and Design

Impact	Impact Conclusions	Proposed Mitigation
	Less than Significant	
	Reservoirs and Points of Diversion	—
	Power for operating lighting, pumps, valves, gages, and other equipment is modest, and operation of reservoirs could result in generation of hydropower	
	Water Treatment Facilties	—
	Operation of water treatment facilities would not result in inefficient, wasteful, or unnecessary consumption of energy because these facilities would provide reliable potable and nonpotable water to meet existing demand in affected areas	
Impact EN-a: Adversely affect the reliability of California's electric grid	**Less than Significant**	
	New or Modified Facilities	—
	Increased electrical load for new or modified facilities would be small compared to the existing local and statewide electrical demand and because much construction activity is powered directly by fossil fuel and, as such, does not require use of the electric grid	
GEOLOGY AND SOILS		
Impact GEO-a: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides **Impact GEO-b:** Result in substantial soil erosion or the loss of topsoil **Impact GEO-c:** Be located on a geologic unit or soil that is unstable or that would	**Potentially Significant** ***Common Construction*** Construction activities could occur in areas known to have seismic activity, or experience landslides or could be located on expansive soil or on a geologic unit or soil that is unstable or would become unstable due to construction Construction activities could occur in areas underlain by soft or loose soils, where high groundwater or seepage may be present, and on sloping grounds	**7.22 MM-GEO-a–e: Mitigate geology and soils impacts** **A. Construction GEO Mitigation Measures (CMM-GEO-a–e)** 1. Regulatory Compliance 2. Project Siting and Design 3. Assurance of No Fault Traces 4. Geology and Soils Management Measures 5. Construction WQ Mitigation Measures:

Impact	Impact Conclusions	Proposed Mitigation
become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse **Impact GEO-e:** Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater I**mpact GEO-d:** Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property **Impact GEO-e:** Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater	Ground disturbance could expose geologic materials or soil, destabilize the material, and cause soil erosion or loss of topsoil Construction activity that involves blasting could trigger landslides on unstable slopes and expose construction workers or members of the public to the risk of injury or death ***Reservoirs and Points of Diversion*** Dams, points of diversions, and other constructed facilities located near active faults could be damaged or fail due to seismic-related ground shaking, fault movements, liquefaction, or lateral spreading Formation of surface springs and seeps in adjacent areas due to leakage from operation of a new reservoir could result in unstable soils, landslides, lateral spreading, subsidence, liquefaction, or collapse Points of diversion and other constructed facilities (e.g., water conveyance pipelines) located near active faults could be damaged or fail if exposed to surface fault rupture or strong seismic ground shaking Reservoirs can draw people to an area for recreation, thereby exposing them to any geologic hazards ***Groundwater Wells and Groundwater Storage and Recovery*** New groundwater wells located in areas with high groundwater levels and cohesionless soils may be subject to effects from liquefaction in a seismic event New groundwater wells could create a shallow water table, making area prone to liquefaction in	Regulatory Compliance (CMM-WQ-a–j: 1) and Erosion Control, Sedimentation Control, and Soil Stabilization Measures (CMM-WQ-a–j: 3) 6. Septic System Management Measures 7. Blasting Operations and Safety Plan 8. Protect Agricultural Soils (CMM-AG-a-e: 4) **B. Reservoirs and Points of Diversion GEO Mitigation Measures** 1. Regulatory Compliance 2. Project Siting and Design for New or Modified Reservoirs 3. Geotechnical Investigations for Dam Foundation and Reservoir Rim 4. Feasibility Studies 5. Sediment Management and Monitoring Plan **C. Groundwater Wells and Groundwater Storage and Recovery GEO Mitigation Measures** 1. Project Design for Passive Recharge 2. Regulatory Compliance (7.22 MM-WQ-a–j: C3) for groundwater wells

Impact	Impact Conclusions	Proposed Mitigation
	areas of poorly consolidated geologic materials Potential for substantial erosion and/or loss of top soil if recharge water is applied at too high of a rate or volume	
	Water Treatment Facilities Siting desalination facilities in a seismically active coastal area could expose people or structures to potential adverse geological effects	**D. Water Treatment Facilities GEO Mitigation Measure** 1. Coordination with the California Coastal Commission
HAZARDS AND HAZARDOUS MATERIALS		
Impact HAZ-a: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials **Impact HAZ-b:** Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment **Impact HAZ-c:** Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school **Impact HAZ-d:** Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment **Impact HAZ-e:** For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety	**Potentially Significant** ***Common Construction*** Accidental release of hazardous materials from construction activities requiring the transport, use, or disposal of hazardous materials (e.g., fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, paint, paint thinner) Safety hazards could occur from rock thrown and scattered from use of explosives Exposure to or the spread of toxic chemicals from excavation during construction that disturb areas with existing soil or groundwater contamination (i.e., asbestos or lead-based paint from existing building materials or stored liquid paints, solvents, and household or industrial-strength maintenance chemicals and cleaners) Underground infrastructure (e.g., natural gas pipelines, utility lines) within a project area could be encountered during excavation and could result in hazards to the public or environment if damaged Disturbance of soils containing *Coccidioides* spores may expose workers and people adjacent to construction sites to these fungal spores in fugitive dust Accidental hazardous materials spills from	**7.22 MM-HAZ-a-h: Mitigate hazards and hazardous materials impacts** **A. Construction HAZ Mitigation Measures (CMM-HAZ-a–h)** 1. Measures for Transport, Use, or Disposal of Hazardous Materials 2. Project Siting 3. Demolition Measures 4. Herbicide and Pesticide Use 5. Hazardous Materials and Worksite Safety Training 6. Emergency Response Plan 7. Construction Site Security 8. Construction near Airports 9. Fire Prevention and Management Plan 10. Asbestos Control Measures (CMM-AQ-a–e: 5) 11. Valley Fever Control Measures (CMM-AQ-a–e: 4) 12. Blasting Operations and Safety Plan (CMM-GEO-a–e: 7) 13. Septic System Management Measures (CMM-

Impact	Impact Conclusions	Proposed Mitigation
hazard for people residing or working in the project area **Impact HAZ-f:** For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area **Impact HAZ-g:** Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan **Impact HAZ-h:** Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	airborne materials (e.g., gases, asbestos particles) or through ignition of flammable liquids or vapors during construction activities could occur within 0.25 mile of a school Impairment of emergency response services' access or interfering with emergency evacuation by rerouting traffic during construction and increased need for emergency service providers during construction due to accidental releases of hazardous materials, work site fires, and vehicular accidents due to construction-related changes in traffic Wildfire risk from the use of electrical or gas-powered equipment, flammable materials (e.g., fuels, solvents), and/or explosives during construction Safety hazards from project components, such as buildings or construction equipment, that encroach on airspace of airport runways Stagnant water present in construction areas during the wet season could create new disease vector habitat (i.e., mosquito habitat) that require application of pesticides Faulty installation or inadequate operation and maintenance of underground or aboveground storage tanks for bulk fuel storage may result in surface water and groundwater contamination, the potential for fire and explosion, exposure of the public to raw sewage, and daylighting of wastewater at the ground surface	GEO-a–e: 6) 14. Mosquito Control Measures 15. Installation and Operation of Underground and Aboveground Storage Tanks 16. Installation and Maintenance of Plumbing in Public Restrooms **B. Hazardous Materials Storage** **C. Hazardous Materials Accidental Spill Response Plan** **D. Hazardous Materials Training** **E. Wildfire Prevention Plan** 1. Signage 2. Parking Restriction 3. Vegetation Maintenance 4. Fire Fighting Equipment
	Reservoirs and Points of Diversion New or modified reservoir and diversion projects could result in prolonged construction-related impacts involving an increase in traffic on narrow rural roads from commuting workers, hauling of	**F. Reservoirs and Points of Diversion HAZ Mitigation Measures** 1. Reservoirs and Points of Diversion WQ Mitigation Measures (7.22 MM-WQ-a–j: B) 2. Handling, Storage and Disposal of Dredged

Impact	Impact Conclusions	Proposed Mitigation
	large equipment, and disposal of wastes Once constructed, some projects may require use of hazardous materials for operations and maintenance (e.g., use of petroleum-based lubricants for machinery, solvents and paints, herbicide control of invasive weeds as part of landscape maintenance, pesticide for control of mosquitoes); improper use or storage of herbicides could result in exposure of the application crews and general public (including children, for sites located within 0.25 mile of a school) to toxic chemicals Dredging could involve removal of contaminated sediment that could accidentally be released to areas and surface waters Release cyanotoxins from harmful algal blooms in new reservoirs Increase in surface water methylmercury due to operation of new reservoirs Reservoirs constructed close to an airport could potentially create a safety hazard for people (e.g., recreationists) by placing them in proximity to hazards associated with airport operations Create conditions favorable to mosquitos, which could lead to increased transmission of mosquito-borne diseases (e.g., West Nile virus) Wildfire risk from the use of vehicles, fire pits and grills, and electrical- or gas-powered maintenance equipment at new reservoirs Potential safety hazards (e.g., aircraft and waterfowl collisions) for air traffic would be associated with new reservoirs located close to an airport Increased potential for transmission of mosquito-borne diseases from the potential creation of	Material (CMM-WQ-a–j: 4vi) 3. Hazardous Material Storage (7.22 MM-HAZ-a–h: B) 4. Hazardous Materials Accidental Spill Response Plan (7.22 MM-HAZ-a–h: C) 5. Hazardous Materials Training (7.22 MM-HAZ-a–h: D) 6. Wildfire Prevention Plan (7.22 MM-HAZ-a–h: E) 7. Air Safety Mitigation 8. Mosquito Control 9. Blasting Operations and Safety Plan (CMM-GEO-a–e: 7)

Impact	Impact Conclusions	Proposed Mitigation
	mosquito habitat at new and expanded reservoirs and points of diversion	
	Groundwater Wells and Groundwater Storage and Recovery Accidental release of hazardous materials during transport and use could be associated with required chemical treatment of water at new groundwater wells Accidental release of hazardous material during transport and disposal of water treatment waste (e.g., used granular activated carbon filters) if water treatment occurs at new groundwater wells Accidental release of hazardous materials during transport and use could occur where diesel-powered pumps are used for groundwater wells Accidental release of hazardous materials during transport and use could occur where water treatment is implemented prior to injection for groundwater storage and recovery Increased potential for transmission of mosquito-borne diseases would result from the potential creation of mosquito habitat in groundwater recharge ponds or spreading basins	**G. Groundwater Wells and Groundwater Storage and Recovery HAZ Mitigation Measure** 1. Mosquito Control (7.22 MM MM-HAZ-a–h: F8)
	Water Treatment Facilities Accidental release of hazardous materials could occur during transport, use, and storage for facility operation Accidental release of hazardous materials could occur during transport and disposal of hazardous waste (e.g., used granular activated carbon filters, biosolids) from water treatment Wildfire risk from the improper storage or use of flammable/ combustible or incompatible chemicals for facility operation and use of electrical or gas-powered equipment during	**H. Water Treatment Facilities HAZ Mitigation Measures** 1. Hazardous Materials Business Plan 2. Design of On-Site Access and Service Roads 3. Measures for Transport, Use, or Disposal of Hazardous Materials (CMM-HAZ-a–h: 1) for operation and maintenance 4. Herbicide and Pesticide Use (CMM-HAZ-a–h: 4) for maintenance 5. Hazardous Materials Storage (7.22 MM-HAZ-a–h: B)

Impact	Impact Conclusions	Proposed Mitigation
	maintenance activities Drinking water treatment plants that include groundwater wells could result in impacts described for new groundwater wells	6. Hazardous Materials Accidental Spill Response Plan (7.22 MM-HAZ-a–h: C) 7. Hazardous Materials Training (7.22 MM-HAZ-a–h: D) 8. Wildfire Prevention Plan (7.22 MM-HAZ-a–h: E) 9. Water Treatment Facilities WQ Mitigation Measures (7.22 MM-WQ-a–j: D) 10. Groundwater Storage and Recovery HAZ Mitigation Measure (7.22 MM-HAZ-a–h: G)
	Other Construction Projects Wildfire risk could increase from the use of electrical or gas-powered equipment during maintenance activities and hot vehicle exhaust systems of maintenance vehicles, fuel-powered equipment, and grinding and welding activities, if required Operation of new or modified boat ramps adjacent to wildlands would attract recreationists and could expose them to wildland fires **Less than Significant**	**I. Other Construction Projects HAZ Mitigation Measure** 1. Wildfire Prevention Plan (7.22 MM-HAZ-a–h: E)
	Reservoirs and Point Diversion A new reservoir could flood a roadway designated in an emergency response plan or evacuation plan	—
Hydrology and Water Quality		
Impact WQ-a: Violate any water quality standards or waste discharge requirements **Impact WQ-b:** Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the	**Potentially Significant** ***Common Construction*** Construction could contribute polluted runoff and sediment to nearby waterbodies In-water construction can cause temporary sediment disturbance and resuspension, which may cause increased turbidity, siltation, and	**7.22 MM-WQ-a–j: Mitigate impacts on hydrology and water quality** **A. Construction WQ Mitigation Measures (CMM-WQ-a–j)** 1. Regulatory Compliance 2. Project Siting and Design

Impact	Impact Conclusions	Proposed Mitigation
production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) **Impact WQ-c:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site **Impact WQ-d:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site **Impact WQ-e:** Create or combine runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff **Impact WQ-f:** Otherwise substantially degrade water quality **Impact WQ-g:** Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map **Impact WQ-h:** Place within a 100-year flood hazard area structures which would impede or redirect flood flows **Impact WQ-i:** Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a	bioavailability of sediment-associated pollutants Accidental release of pollutants that could enter storm drains or streams; pollutants include petroleum products (e.g., fuel, oil, grease from vehicles and equipment), paving materials (e.g., concrete and asphalt), other materials used or stored on site (e.g., paint, adhesives, solvents), and project waste (e.g., litter, debris, hazardous and liquid waste) Use of herbicides to control invasive plant species could affect water quality and violate water quality standards if improperly applied or stored Faulty installation or inadequate operation and maintenance of underground or aboveground storage tanks for bulk fuel storage may result in surface water and groundwater contamination and release of raw sewage, which could affect groundwater and surface water quality Improper siting of septic systems could result in adverse water quality effects Localized degradation of groundwater quality could result from temporary, short-term constructions activities Blasting, saw-cutting, and hydraulic hammering could release concrete and other particles into surface waters, which could violate water quality standards and/or affect aquatic resources Construction activities may lower local groundwater through dewatering; dewatered groundwater of poor quality could increase turbidity, dissolved solids, nutrients, metals, or other constituents if discharged to a surface waterway Construction could substantially alter drainage patterns of a project site and thereby cause	3. Erosion Control, Sedimentation Control, and Soil Stabilization Measures: 4. Waste Management and Material Control Measures 5. In-Water Placement of Materials, Structures, and Operation of Equipment 6. Stream-Crossing, Culvert, and Bridge Projects 7. Groundwater Protection Measures 8. Drainage and Flood Protection Measures 9. Construction GEO Mitigation Measures: Blasting Operations and Safety Plan (CMM-GEO-a–e: 7) and Septic System Management Measures (CMM-GEO-a–e: 6) 10. Construction BIO Mitigation Measures (CMM-BIO-a–f) 11. Construction HAZ Mitigation Measures: Herbicide and Pesticide Use (CMM-HAZ-a–h: 4); Installation and Operation of Underground and Aboveground Storage Tanks (CMM-HAZ-a–h: 15); and Installation and Maintenance of Plumbing in Public Restrooms (CMM-HAZ-a–h: 16)

Impact	Impact Conclusions	Proposed Mitigation
result of the failure of a levee or dam	erosion, siltation or flooding, on site or off site	
Impact WQ-j: Inundation by seiche, tsunami, or mudflow	Construction activities could change the on-site land slopes across which drainage flows, which could alter the flow rates, directions, water surface elevations, or velocities of runoff that enters or originates on the construction site Activities such as grading, vegetation removal, soil compacting, and paving could increase land surface imperviousness and affect water quality by creating surfaces where pollutants (e.g., petroleum products from vehicles) can accumulate and later be washed into waterways Project sites may be located within a 100-year flood hazard area or in areas subject to inundation by seiche, tsunami, or mudflow	
	Reservoirs and Points of Diversion Dams and points of diversion can alter flow regimes and reduce or eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter temperatures to the detriment of coldwater species, and alter salinity gradients and circulation patterns in the Delta Dams and points of diversion reduce stream flows, which could injure water right holders, alter water quality, affect surface water-groundwater interactions, and reduce groundwater recharge Changes in streamflow could affect instream chemical constituent concentrations due to changes in instream dilution, potentially affecting the ability of a waste discharger or drinking water provider to comply with waste discharge requirements and/or water quality standards	**B. Reservoirs and Points of Diversion WQ Mitigation Measures** 1. Project Planning 2. Feasibility Studies 3. Regulatory Compliance 4. Reservoir Operations and Management Plan 5. Prevent Impacts on Instream Flows 6. Develop Flood Control Rules 7. National Management Measures to Control Nonpoint Source Pollution from Hydromodification 8. Methylmercury Management for New Reservoirs 9. Harmful Algal Bloom Management for New Reservoirs 10. Construction Timing for a Dam Raise Project 11. Dredging Plan 12. Project Siting and Design for New or

Impact	Impact Conclusions	Proposed Mitigation
	Reservoirs create conditions conducive to harmful algal blooms, growth of invasive aquatic vegetation, and methylation of mercury Reservoirs could affect channel erosion, sedimentation, and morphology as a result of long-term changes in the sediment balance Sediment accumulation at the bottom of a reservoir may contribute to anoxic conditions and reduced water quality Capture of sediment behind a dam can reduce the sediment supply to downstream waterways, affecting habitat and altering the balance between erosion and sedimentation Where reservoir expansion occurs through dredging, dredged sediments may contain contaminants (e.g., mercury and other metals, polychlorinated biphenyls, polyaromatic hydrocarbons) in concentrations that may violate water quality standards or otherwise degrade reservoir and downstream water quality if mobilized Dredging may result in the indirect, temporary, and short-term reduction of dissolved oxygen in the water column as a result of the suspension of anoxic organic matter in sediment Reservoir construction could result in temporary and permanent changes to drainages, erosion, or runoff due to grading or preparation of land as well as major excavation and blasting for dam foundation preparation Failure of new or modified dams would result in flooding, potentially exposing people or structures to a significant risk of loss, injury, or death Construction of facility pipelines associated with reservoirs and points of diversion through or	Modified Reservoirs (7.22 MM-GEO-a–e: B2) 13. Geotechnical Investigations for Dam Foundation and Reservoir Rim (7.22 MM-GEO-a–e: B3)

Impact	Impact Conclusions	Proposed Mitigation
	under levees could compromise levee integrity and cause flooding Points of diversion could cause localized changes in sedimentation and bioavailability of pollutants	
	Groundwater Wells and Groundwater Storage and Recovery Inappropriate siting, design, or construction of groundwater wells could result in groundwater contamination New groundwater wells located where multiple aquifer zones of varying water quality are cross-connected could cause a general degradation of groundwater quality Degradation of surface water and/or groundwater quality could occur from accidental release of water treatment chemicals used at groundwater wells Operation of new urban wells could degrade water quality by drawing in (inducing movement of) poorer-quality water	**C. Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures** 1. Well Siting 2. Groundwater Monitoring 3. Regulatory Compliance
	Water Treatment Facilities Water treatment facilities could violate standards or waste discharge requirements if discharges do not comply with all regulations pertaining to water quality standards and regulations to prevent degradation of water quality in receiving waters Degradation of surface water and/or groundwater quality could occur if treatment sludge is not properly contained Degradation of surface water quality could result from discharge of brine at desalination facilities Degradation of surface water and/or groundwater quality could occur from accidental release of	**D. Water Treatment Facilities WQ Mitigation Measures** 1. Regulatory Compliance 2. Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures (7.22 MM-WQ-a–j: C) (i.e., well siting, groundwater monitoring, and regulatory compliance, if applicable) 3. Hazardous Materials Business Plan (7.22 MM-HAZ-a–h: H1), as applicable 4. Desalination Facilities WQ Mitigation Measures

Impact	Impact Conclusions	Proposed Mitigation
	water treatment chemicals during transport, storage, or use	
	Operation of subsurface or open water intakes at desalination facilities can result in significant intake and mortality of all forms of marine life from impingement and entrainment	
	New drinking water treatment plants that include groundwater wells could result in impacts described for new groundwater wells (see *Groundwater Wells and Groundwater Storage and Recovery*)	
	Maintenance of a water treatment facility would require storage and use of chemicals (e.g., coagulants, flocculants, chlorination agents, biocides) as part of the water treatment process; accidental release of these chemicals, which could be transported off site by stormwater to surface water, could adversely affect surface water quality as well as groundwater quality	
	Less than Significant	
	Reservoirs and Points of Diversion	—
	Flood control rules would be developed for new or modified reservoirs to provide sufficient storage space to contain inflow during high runoff events and prevent use of emergency spillways	
	Reservoir releases are generally limited to flows that can be contained by downstream levees; although, in some instances of very high inflows, required reservoir releases may exceed downstream levee capacities	
	Beneficial	
	Reservoirs and Points of Diversion	—
	Off-stream reservoirs would reduce flooding associated with local drainages in the reservoir	

Impact	Impact Conclusions	Proposed Mitigation
	footprint and could reduce flooding in the source-water stream by diverting water during high flows Dams and points of diversion can reduce peak winter flow, which would reduce large-scale movement of substrate and potentially contaminated sediment Dams and points of diversion could reduce floodplain inundation, potentially reducing formation of methylmercury Some dams can prevent further expansion of invasive species	
LAND USE AND PLANNING		
Impact LU-a: Physically divide an established community **Impact LU-b:** Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect **Impact LU-c:** Conflict with any applicable habitat conservation plan or natural community conservation plan? *Refer to Section 7.22.2.4, Biological Resources*	**Potentially Significant** ***Common Construction*** Temporary effects on existing land uses by activities such as ground clearing, increased traffic, noise, dust, and human activity, as well as by changes in the visual landscape Construction may temporarily physically divide an established community, primarily by cutting off access to roadways or bridges Siting permanent facilities within an established community (e.g., distribution pipelines and other infrastructure) could create physical barriers that could divide the community Siting and construction could result in a permanent change in land use that could conflict with land use plans, policies, or regulations, depending on the location, configuration, and magnitude of the project ***Reservoirs and Points of Diversion*** Siting of reservoirs or points of diversion and associated facilities may conflict with existing land uses and require changes to the land use	**7.22 MM-LU-a–c: Mitigate land use impacts** **A. Construction LU Mitigation Measures (CMM-LU-a–c)** 1. Regulatory Compliance 2. Project Siting and Design 3. Traffic Mitigation Plan (CMM-TRA-a,b,d–f: 3) **B. Reservoirs and Points of Diversion LU Mitigation Measures** 1. Feasibility Study

Impact	Impact Conclusions	Proposed Mitigation
	designations in local general and specific plans Removal of bridges and roads may result in permanent physical division of an established community	2. Minimize Community Disruption due to Hauling/Disposing of Construction Waste 3. Provide Appropriate Land Compensation 4. Project Planning (7.22 MM-TRA-a,b,d–f: B1) 5. Reservoirs and Points of Diversion REC Mitigation Measures (7.22 MM-REC-a,b: B)
MINERAL RESOURCES		
Impact MIN-a: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? **Impact MIN-b:** Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan	**Potentially Significant** ***Common Construction*** Construction activities could be located in areas with active natural gas, oil, or aggregate production or with the potential to contain untapped reserves of those resources and restrict access Construction demand for aggregate and/or cement for construction projects could exceed local supplies	**7.22 MM-MIN-a,b: Mitigate impacts on mineral resources** **A. Construction MIN Mitigation Measures (CMM-MIN-a,b)** 1. Project Siting and Design 2. Aggregate Use 3. Access to Extraction Sites 4. Implement the California Department of Conservation's Geologic Energy Management Division's (CalGEM) Recommendations
NOISE		
Impact NOI-a: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies **Impact NOI-b:** Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels **Impact NOI-d:** A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project **Impact NOI-e:** For a project located within	**Potentially Significant** ***Common Construction*** Construction would result in temporary noise and groundborne vibration from the use of heavy construction equipment (e.g., excavators, bulldozers, pile drivers, jackhammers), drilling, and blasting Noise-sensitive receptors may be exposed to noise levels in excess of established standards or to a substantial increase in ambient noise Project sites may be located near a public or private airport or airstrip and temporarily expose	**7.22 MM-NOI-a–f: Mitigate noise and vibration impacts** **A. Construction NOI Mitigation Measures (CMM-NOI-a,b,d–f)** 1. Regulatory Compliance 2. Noise-Reduction Measures 3. Vibration-Reduction Measures 4. Blasting Operations and Safety Plan (CMM-GEO-a-e: 7) 5. Construction near Airports (CMM-HAZ-a–h: 8)

Impact	Impact Conclusions	Proposed Mitigation
an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	construction crews to excessive noise levels **Less than Significant**	
Impact NOI-f: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels	***New or Modified Facilities*** Operation and maintenance of new or modified facilities likely would not result in exposure of sensitive receptors to or generation of excessive groundborne noise or vibration levels because vibration generated by most activities is relatively minor and would not occur at a perceptible level	—
Impact NOI-c: A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project	**Potentially Significant** ***Reservoirs and Points of Diversion, Groundwater Wells and Groundwater Storage and Recovery, and Water Treatment Facilities*** Operation and maintenance could generate noise, including permanent or periodic increased ambient noise from intakes and conveyance facilities; use of transformers, generators, fans, groundwater well and other pumps, and alarms	**B. Reservoirs and Points of Diversion, Groundwater Wells and Groundwater Storage and Recovery, and Water Treatment Facilities NOI Mitigation Measures (NOI-a,c,d)** 1. Noise-Reduction Consideration in Project Design and Operations 2. Operational Truck Traffic Noise
POPULATION AND HOUSING		
Impact POP-a: Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) **Impact POP-b:** Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere **Impact POP-c:** Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	**Less than Significant** ***New or Modified Facilities*** During construction, non-locals may move to a project area to support these activities; however, any additional need for lodging would be temporary and could likely be met via local accommodations New or modified facilities would not involve construction of new homes or businesses, extension of roads, other infrastructure, or other actions that may directly or indirectly induce substantial population growth in an area Job creation is not expected to cause substantial population growth because new or modified	—

Impact	Impact Conclusions	Proposed Mitigation
	facility projects do not require extensive staff and therefore would add few jobs A small number of people would be displaced by a new reservoir and would not result in a housing shortage or cause increased demand in another community	
PUBLIC SERVICES		
Impact PS-a: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: fire protection, police protection, schools, parks (see Recreation), or other public facilities	**Less than Significant** ***New or Modified Facilities*** New or modified facilities would not result in increases in housing or in population and therefore would not create a need for additional schools, parks, or other public facilities Construction activities could result in temporary, short-term increased response times for fire, police, and other emergency responders due to increased construction traffic and potential road closures and detours Construction activities could result in temporary increases in the number of fire, police, or emergency medical provider service calls in the vicinity of work sites for emergencies related to construction; but calls are not expected to be large enough or frequent enough to affect response times beyond the regular variation experienced by providers of emergency services	—
RECREATION		
Impact REC-a: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated **Impact REC-b:** Include recreational facilities or require the construction or	**Potentially Significant** ***Common Construction*** Recreationists could be affected by construction-related traffic, visual impacts, water quality effects, noise, fugitive dust, and exhaust emissions from heavy equipment; restricted access to recreational	**7.22 MM-REC-a,b: Mitigate impacts on recreation** **A. Construction REC Mitigation Measures (CMM-REC-a,b)** 1. Project Siting and Design

Impact	Impact Conclusions	Proposed Mitigation
expansion of recreational facilities that might have an adverse physical effect on the environment	facilities could result in physical deterioration of alternative locations and facilities	2. Maintain Access to Existing Recreational Facilities during Construction 3. Coordinate with Public and Private Recreation Providers 4. Rehabilitate or Restore Degraded Recreational Facilities or Provide Replacement Recreational Facilities 5. Construction AES Mitigation Measures (CMM-AES-a–d) 6. Construction AQ Mitigation Measures (CMM-AQ-a–e) 7. Construction WQ Mitigation Measures (CMM-WQ-a–j) 8. Construction NOI Mitigation Measures (CMM-NOI-a,b,d–f) 9. Construction TRA Mitigation Measures (CMM-TRA-a,b,d–f)
	Reservoirs and Points of Diversion Larger reservoirs and points of diversion facilities could restrict recreation in the vicinity of diversion because of a need for a safety zone around the facility Reservoirs and points of diversion may alter water levels and flow, which could adversely affect boating and fishing areas, public and private recreational facilities, or waterways used for recreation Reservoirs and points of diversion projects could inundate areas previously used for recreation Displacement of recreationists to other locations could result in accelerated physical deterioration of some recreational facilities over time	**B. Reservoirs and Points of Diversion REC Mitigation Measures** 1. Project Siting and Design 2. Project Planning 3. Coordination with Public Recreation Providers 4. Compensate for Impacts on Recreational Facilities 5. Construction WQ Mitigation Measures (CMM-WQ-a–j) 6. Construction BIO Mitigation Measures (CMM-BIO-a–f)
	Water Treatment Facilities If a new wastewater treatment plant were located	**C. Water Treatment Facilities REC Mitigation Measures**

Impact	Impact Conclusions	Proposed Mitigation
	near an established recreational area, recreationists may choose other recreational locations because of odor from treatment operations; this could result in accelerated physical deterioration of these alternative locations and facilities over time	1. Water Treatment Facilities AQ Mitigation Measures (7.22 MM-AQ-a–e: C)
	Less than Significant	
	Other Construction Projects	—
	Agricultural canal lining or encasement could reduce fishing opportunities by reducing the numbers of sport fish in a canal	
	Beneficial	
	Reservoirs and Points of Diversion	—
	New reservoirs would likely include development of reservoir-associated recreation facilities	
	Water Treatment Facilities	
	Water treatment facilities could include recreation benefits, such as a visitor center, trails, or educational signage	
	Other Construction Projects	
	Modifications of reservoir boat ramps would allow continued use of an existing recreational facility	
TRANSPORTATION and TRAFFIC		
Impact TRA-a: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian	**Potentially Significant**	
	Common Construction	**7.22 MM-TRA- a,b,d–f: Mitigate transportation impacts**
	Construction activities could result in temporary and short-term increases in traffic due to additional vehicles (e.g., construction vehicles, construction workers' personal vehicles) on roads near project sites and relocating roads, which would cause new rerouted traffic at an intersection not designed to accommodate additional traffic	**A. Construction TRA Mitigation Measures (CMM-TRA-a,b,d–f)** 1. Regulatory Compliance 2. Avoid and Minimize Interference with Transportation Networks

Impact	Impact Conclusions	Proposed Mitigation
and bicycle paths, and mass transit **Impact TRA-b:** Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways **Impact TRA-d:** Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) **Impact TRA-e:** Result in inadequate emergency access **Impact TRA-f:** Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	Construction activities may result in degradation of roads from haul trucks or trips required for fill transport Temporary relocation, closure, or complete removal of existing bicycle and pedestrian paths and trails could occur during construction Projects requiring in-channel construction activities could temporarily obstruct boat navigation and cause boat traffic delays and construction equipment, such as dredges and cofferdams, could temporarily obstruct boat traffic Construction projects may result in roads being temporary blocked, rerouted, or altered, which could affect emergency access Permanent relocation of road segments could require changes that could increase or introduce a hazard to vehicles traveling on that segment	3. Traffic Management Plan 4. Restore Damaged Transportation Facilities 5. Waterway Traffic Control Plan 6. Road and Bridge Design
	Reservoirs and Points of Diversion Reservoirs could require dredging operations, which would increase traffic related to trucking dredged material to another location for reuse or disposal Operation of reservoirs with recreational facilities could attract a substantial number of recreationists, which could cause periodic traffic congestion as well as unplanned wear and tear on rural roads **Less than Significant**	**B. Reservoirs and Points of Diversion TRA Mitigation Measures** 1. Project Planning 2. Road Design 3. Feasibility Study (7.22 MM-LU-a–c: B1) 4. Project Siting and Design (7.22 MM-REC-a,b: B1) 5. Project Planning (7.22 MM-REC-a,b: B2)
	New or Modified Facilities Limited additional vehicle trips would be associated with workers commuting to sites to conduct operation and maintenance activities	—

Impact	Impact Conclusions	Proposed Mitigation
Impact TRA-c: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	**No Impact** ***New or Modified Facilities*** New or modified facilities would not result in a change in air traffic patterns because no airport facilities are proposed, and demand for air travel would not increase as a result of implementing these types of projects	—
UTILITIES AND SERVICE SYSTEMS		
Impact UT-a: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board **Impact UT-c:** Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects **Impact UT-f:** Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs **Impact UT-g:** Comply with federal, state, and local statutes and regulations related to solid waste	**Potentially Significant** ***Common Construction*** Construction sites could generate stormwater runoff that discharges sediment and other pollutants Wastewater from construction could include wastewater from sanitation facilities used by construction crews or wastewater generated directly from construction-related activities Construction activities could temporarily increase the volume of solid waste (e.g., soil, vegetative material, construction debris) disposed of at landfills Construction activities could temporarily disrupt existing electric and natural gas utilities and telecommunication lines and could damage utility poles or snag suspended utility lines	**7.22 MM-UT-a,c–g: Mitigate impacts on utilities and service systems** **A. Construction UT Mitigation Measures (CMM-UT-a,c,f,g)** 1. Wastewater Control Measures 2. Water Supply 3. Non-Hazardous Waste Disposal 4. Utility Services 5. Site-Specific Drainage Study
	Reservoirs and Points of Diversion Expansion of existing reservoirs through dredging may result in dredged material that cannot be reused for beneficial purposes and thus would require disposal at an appropriate landfill facility Reservoirs and points of diversion would require State Water Board approval of a new water right or a change of an existing right	**B. Reservoir and Points of Diversion UT Mitigation Measure** 1. Reservoirs and Points of Diversion WQ Mitigation Measures (7.22 MM-WQ-a–j: B)

Impact	Impact Conclusions	Proposed Mitigation
	Groundwater Wells and Groundwater Storage and Recovery	**C. Groundwater Wells and Groundwater Storage and Recovery UT Mitigation Measure**
	A new groundwater well would require a valid groundwater right, either overlying or appropriative, and depending on the location, the right would need to be consistent with any relevant groundwater sustainability plan (GSP)	1. Groundwater Wells and Groundwater Storage and Recovery WQ Mitigation Measures (7.22 MM-WQ-a–j: C)
	Groundwater storage and recovery of surface water would capture a new supply that is generally not subject to existing entitlements; therefore, new entitlement could be required in the form of water right permits from the State Water Board	
	Water Treatment Facilities	**D. Water Treatment Facilities UT Mitigation Measure**
	Drinking water treatment plants would require a valid water right if drawing surface water or groundwater as a source, and groundwater withdraw may require consistency with a GSP depending on the location	1. Water Treatment Facilities WQ Mitigation Measures (7.22 MM-WQ-a–j: D)
	Less than Significant	
	Reservoirs and Points of Diversion	—
	Generation of trash at on-site recreational facilities would be seasonal; it is unlikely that the volume generated would exceed the capacity of a local landfill	
Impact UT-b: Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects **Impact UT-d:** Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	**Less than Significant**	
	Common Construction	—
	Construction activities would require a water supply, but the uses for this water during construction would not be of sufficient magnitude or duration to require new or expanded entitlements for water supply	
	Wastewater generated during construction would not likely require construction of new or expanded	

Impact	Impact Conclusions	Proposed Mitigation
Impact UT-e: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	wastewater treatment facilities or result in a determination by the wastewater treatment provider that it has inadequate capacity; wastewater generated during construction would not affect the ability of a wastewater treatment facility to meet the wastewater treatment requirements of a regional water board **Potentially Significant** ***Reservoirs and Points of Diversion*** Reservoirs and points of diversion would require State Water Board approval of a new water right or a change of an existing right ***Groundwater Wells and Groundwater Storage and Recovery*** New groundwater well would require a valid groundwater right, either overlying or appropriative, and depending on the location Groundwater storage of surface water would capture a new supply that is generally not subject to existing entitlements; this would require new entitlement in the form of a water right permit from the State Water Board	

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